ABSTRACTS

Oral Presentations

THE ROLE OF ECHOCARDIOGRAPHY IN THE ICCU

The role of echocardiography for the diagnosis of valvular emergencies in the ICCU

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This presentation will focus on the value and importance of transthoracic (TTE), transesophageal (TEE) and 3D echocardiography for the diagnosis of valvular emergencies in the intensive coronary care unit setting. Acute or chronic dysfunction of native and prosthetic valves may cause hemodynamic deterioration resulting in cardiogenic shock and should be considered in its differential diagnosis. In the shock trial registry (1) of 1190 patients with cardiogenic shock, 8% suffered from a preexisting severe valvular disease, which caused or worsened their hemodynamic status. A rapid diagnosis of a valvular etiology in a patient with acute hemodynamic deterioration is very important because emergency intervention such as intensive medical therapy, percutaneous balloon valvuloplasty (2-4), or emergent valve replacement can be effective, and, at times, life saving. Clinical clues (from the patient's history, symptoms and signs) suggesting valvular etiology are very important but often difficult to get in-patient in pulmonary edema or cardiogenic shock. Therefore, echocardiography (TTE or TEE) is the best imaging modality to diagnose the etiology of acute hemodynamic deterioration and should be performed as soon as possible (5-8). It can be done at bedside without the need to transfer the patient a way form the intensive care setting to CT or MRI laboratory where monitoring of the patient is not ideal. With echocardiography we can differentiate between cardiogenic and non-cardiogenic reasons for the patient's acute deterioration. It can easily diagnose critical valve stenosis, severe valvular regurgitation, or prosthetic valve malfunction as the cause of shock. We can also diagnose significant LV or RV dysfunction, mechanical complication of acute myocardial infarction, acute tamponade, hypovolemia, acute aortic dissection, and also directing the physician for the possibility of acute pulmonary emboli. In many of the cases simple tansthoracic echocardiography in a specialist hands is enough to make most of this diagnoses (9). TEE is very important for definite diagnosis but in some cases can be done later on in the operating room when needed. Recently real time 3D TEE emerged as a new exciting diagnostic modality (10). This new tool is already shows added diagnostic value in some valvular pathologies (mainly mitral) and also as an important tool for guiding percutaneous vavular interventions (11). Its roll in the setting of ICCU is not known yet. Catheterization which was so important in the past to diagnose many of these pathologies are seldom needed for the diagnosis and is done mainly for those patients who needs emergent surgery for rolling out coronary artery disease. Most hemodynamic parameters such as pulmonary pressure, end diastolic pressure, shunts calculations, valves area and severity of valve regurgitation are easily received by echocardiography (7).

References

1. Hochman JS, Buller CE, Sleeper LA, Boland J, Dzavik V, Sanborn TA, Godfrey E, White HD, Lim J, LeJemtel T. Cardiogenic shock complicating acute myocardial infarction--etiologies, management and outcome: a report from the SHOCK Trial Registry. SHould we emergently revascularize Occluded Coronaries for cardiogenic shocK? J Am Coll Cardiol. 2000 36(3 Suppl A):1063-70
2. Goldman JH, Slade A, Clague J. Cardiogenic shock secondary to mitral stenosis treated by balloon mitral valvuloplasty. Cathet Cardiovasc Diagn. 1998 ;43:195-7.
3. Moreno PR, Jang IK, Newell JB, Block PC, Palacios IF. The role of percutaneous aortic balloon valvuloplasty in patients with cardiogenic shock and critical aortic stenosis. J Am Coll Cardiol. 1994;23:1071-5.
4. Shareghi S, Rasouli L, Shavelle DM, Burstein S, Matthews RV. Current results of balloon aortic valvuloplasty in high-risk patients. J Invasive Cardiol. 2007 Jan;19(1):1-5.
5. Kim R, Chakko S, Myerburg RJ, Kessler KM. Clinical usefulness and cost of echocardiography in patients admitted to a coronary care unit. Am J Cardiol. 1997 Nov 15;80:1273-6.
6. Romano S, Varveri A, Aurigemma G, Dagianti A, Vitarelli A, Sciomer S, Pastore LR, Penco M, Dagianti A. Echocardiography in the coronary care unit: diagnostic and prognostic impact in comparison with clinical and other indicators. Am J Cardiol. 1998 18;81(12A):13G-16G
7. Costachescu T, Denault A, Guimond JG, Couture P, Carignan S, Sheridan P, Hellou G, Blair L, Normandin L, Babin D, Allard M, Harel F, Buithieu J. The hemodynamically unstable patient in the intensive care unit: hemodynamic vs. transesophageal echocardiographic monitoring. Crit Care Med. 2002 ;30:1214-23.
8. Berkowitz MJ, Picard MH, Harkness S, Sanborn TA, Hochman JS, Slater JN. Echocardiographic and angiographic correlations in patients with cardiogenic shock secondary to acute myocardial infarction. Am J Cardiol. 2006 15;98:1004-8
9. Joseph MX, Disney PJ, Da Costa R, Hutchison SJ. Transthoracic echocardiography to identify or exclude cardiac cause of shock. Chest. 2004 Nov;126(5):1592-7.
10. Sugeng L, Shernan SK, Weinert L, Shook D, Raman J, Jeevanandam V, DuPont F, Fox J, Mor-Avi V, Lang RM. Real-time three-dimensional transesophageal echocardiography in valve disease: comparison with surgical findings and evaluation of prosthetic valves. J Am Soc Echocardiogr. 2008: 21:1347-54.
11. Little SH, Kleiman N, Guthikonda S Percutaneous paravalvular repair: guidance using live 3-dimensional transesophageal echocardiography. J Am Coll Cardiol. 2009 21;53:1467

NURSING SESSION I:
CARE OF THE CRITICAL CARE PATIENT

Overview – changes in emergency cardiac care over the past years

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Nurses have been pivotal to the success of the concept of coronary care since its inception in the 1960s, working closely with cardiological and emergency physicians, ambulance personnel and other team members. In the ensuing decades, advances in science and in clinical practice have led to the introduction of new treatments and care strategies, and development of national and international guidelines and policies to reduce the burden of cardiovascular disease on patients, families and Society at large. This presentation will provide an overview of the key developments in emergency cardiac care, from early experience with defibrillation and the introduction of the coronary care unit, through advances in pre-hospital care, reperfusion therapies and other aspects of generating and applying the best evidence to benefit patients – including challenging some of the accepted practices which have become routine despite lack of evidence of safety and efficacy, or even evidence suggestive of harm.

CHALLENGES AND NEW FRONTIERS IN ANTI-PLATELET THERAPY

Assessment of platelet function in acute coronary syndrome

Elena Vasilieva, *Moscow, Russia*

Antiplatelet therapy is the cornerstone of the treatment of acute coronary syndrome (ACS). It is clear now that antiplatelet therapies such as aspirin and clopidogrel have different effects in different patients. Moreover, laboratory-assessed low responsiveness to aspirin and clopidogrel correlates with adverse clinical events. Largely because of the absence of standard and easy methods for the assessment of platelet state, however, laboratory examination of platelet function has not yet become a standard part of antiplatelet treatment. The most frequently used method for the assessment of platelet function is still light-transmission aggregometry, which is too time-consuming and gives variable results. Several other methods, such as platelet-monocyte aggregates, VASP phosphorylation, PFA-100, and serum and urine TXB2, have other limitations: necessity for a flow-cytometer, high dependence on platelet count, low specificity, and high price. The results of various tests do not always correlate with one another.

During the past few years, several new techniques have been proposed that are rather simple and can be performed at the point of care. These include, the VerifyNow platelet function assay, thromboelastography modified for platelets, and multiple electrode platelet aggregometry. Several communications have indicated that a low response to clopidogrel and/or aspirin as evaluated with these methods correlates with a worse prognosis. We need clinical trials to confirm that adjustment of antiplatelet therapy to the results of point-of-care platelet monitoring can improve the outcome for ACS patients.

NOVEL DIAGNOSTIC AND THERAPEUTIC APPROACHES IN THE HIGH RISK PATIENT

Can we identify the vulnerable plaque?

Amir Lerman, *Department of Cardiovascular Diseases, The Mayo Clinic, Rochester, MN, USA*

Based on the current concept acute coronary syndrome and sudden cardiac death are consequences of non obstructive coronary artery disease plaque rupture, advancing the concept of vulnerable plaque as the underlying mechanism for acute coronary syndrome. Conventional imaging techniques can not identify these plaques and thus, more sophisticated advanced modalities should be considered. However, most of these modalities involve invasive intracoronary imaging techniques that prevent these methodologies to be widely used and as a tool to identify the patient at risk. Therefore, more noninvasive markers should develop which correlate with the presence and the components of the vulnerable plaque in order to identify the vulnerable patients. These peripheral markers not only serve as a marker but also have the evidence to participate in the disease process and are more of risk factors rather than only markers. Among them, Lp-PLA2 emerges as a more specific risk factor and marker that plays major role in the pathogenesis and complications of atherosclerosis and can be potentialy used to identify the vulnerable plaque and the patients.

Omega-3 fatty acids in cardiovascular disease: a new promise

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Omacor in the GISSI-P trial

In the GISSI-Prevenzione (Prevention) trial (1-3), patients who survived a myocardial infarction were treated with EPA+DHA ethyl esters (Omacor) corresponding to an intake of 1 g/day EPA+DHA in one capsule. Mortality risk was reduced by 20%, cardiovascular mortality risk by 30% and sudden cardiac death risk (SCD) by 45%. Since the risk of re-infarction was not significantly reduced, it appears that the EPA+DHA ethyl esters had a specific action on mechanisms leading to SCD, i.e., an anti-arrhythmogenic action. The patients were on standard care (anti-platelet drug, beta-blocker, ACE-inhibitor and, at the end of the study, also a statin). The relevance of the particular ethyl ester formulation has, however, been underrated until now:

i. Ethyl esters, but not triglycerides, commonly present in fish oils were used. Ethyl esters result in a sustained uptake of DHA and EPA. After intestinal absorption, long-chain fatty acids reach the coronaries via the thoracic duct and bypass the liver (contrary to amino acids and sugars). It appears that ethyl esters have the advantage of providing a sustained increase in lymph DHA and EPA levels, which are expected to contribute to the critical rise in DHA and EPA required for the anti-arrhythmogenic action (4).
ii. Omacor used in GISSI-Prevenzione study contained a minimum of 84% of the long-chain omega-3 fatty acids EPA and DHA, whereby the ratio of EPA:DHA was 46:38%. In rats with low dose intake of omega-3 fatty acids, DHA but not EPA appeared to inhibit ischemia-induced cardiac arrhythmias (5). One should, therefore, not refer in guidelines to 1 g omega-3 fatty acids in general when referring to GISSI-Prevenzione but specify the EPA:DHA ratio.
iii. Since highly purified ethyl esters were used, more purification steps were involved than in the extraction of triglycerides present in fish oils, which is expected to reduce the contamination particularly with methyl mercury which has been associated with an increased risk of MI (6). Body mercury was correlated with omega-3 fatty acids, indicating that omega-3 fatty acids were derived from fish or fish oils contaminated with mercury. It appears, therefore, mandatory to use in post-MI patients EPA+DHA preparations with a minimum of methyl mercury and other environmental pollutants such as polychlorinated biphenyls and dioxins.
iv. In post-MI patients on standard care (i.e., anti-platelet drug, beta-blocker, ACE-inhibitor, statin) a preparation with 1g EPA+DHA in one capsule is required. The known low compliance with multiple capsule intake (e.g., 32% permanent noncompliance for beta-blocker use in COMET (7) was also one of the reasons for the production of ethyl esters using transesterification of fish oil triglycerides resulting in a highly concentrated preparation.

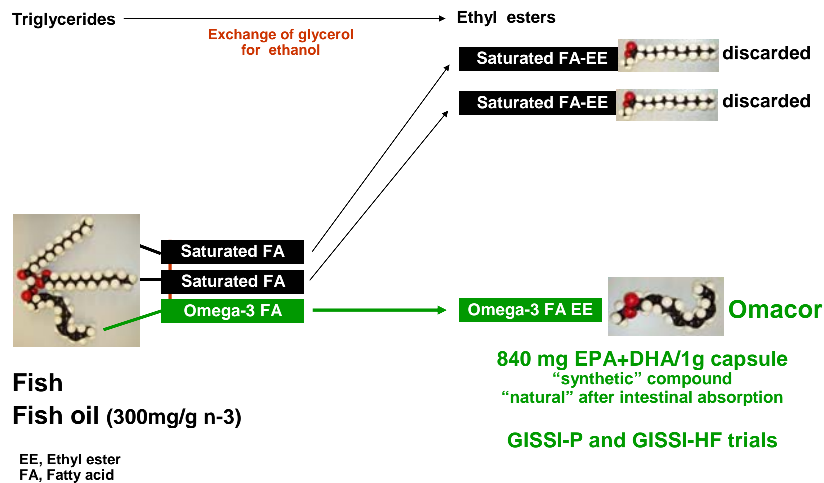

Figure 1. Transesterification of fish oil triglycerides resulting in ethyl esters present in Omacor

Omacor in the GISSI-HF trial

The value of adding 1g/day EPA/DHA ethyl esters (Omacor) to standard therapy for heart failure has been established by the results of the recent GISSI-HF trial (8). This randomized, double-blind, placebo-controlled trial, conducted at 357 cardiology or internal medicine centres in Italy under the direction of the GISSI group recruited 7046 patients with heart failure. Omacor therapy was associated with statistically significant benefits on both the co-primary endpoints: time to death from any cause—the adjusted hazard ratio was 0.91 (95.5% CI 0.833–0.998; P = 0.041). For time to all-cause mortality or admission to hospital for any cardiovascular reason the adjusted hazard ratio was 0.92 (99% CI 0.849–0.999; P = 0.009). The effects were consistent across a wide range of prespecified subgroups, including ejection fraction > or <40%, etiology of heart failure (ischemic *vs* non-ischemic), baseline NYHA grade, diabetes at baseline or age.

The effects of Omacor on the GISSI-HF primary endpoints can also be expressed as the number of patients that have to be treated for the time of the follow-up to prevent one endpoint event, i.e., number-needed-to-treat (NNT). For all-cause mortality, NNT for Omacor was 56; for all-cause mortality or hospitalization for a cardiovascular cause, the NNT was 44. Said in other words, when 1000 patients are treated with Omacor for ~4 years, 18 lives were saved and 17 cardiovascular hospitalizations were prevented.

The results of GISSI-HF mandate, therefore, in our opinion the use of 1 g/day Omacor in heart failure patients. Heart failure guidelines should be amended to reflect this fact.

In summary, although great progress has been made in elucidating the anti-arrhythmogenic action of DHA+EPA and the GISSI-P and GISSI-HF studies have provided clear evidence on the clinical effectiveness, one should be more careful when referring to the active ingredients of Omacor. It is not justified to extrapolate to omega-3 fatty acids in general or to refer to Omacor as "n-3 polyunsaturated fatty acid supplementation". In particular, there is no evidence to infer that fish oil capsules could be a substitute. Also the exchange of DHA for EPA is expected to result in a different therapeutic profile. To avoid further confusion it is urged to specify the actual ingredients in the guidelines.

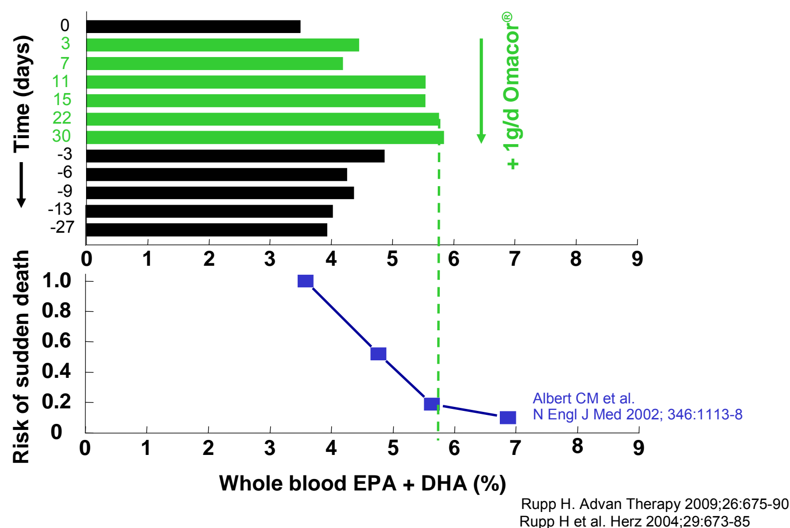

Figure 2. Increase in the EPA+DHA level in whole blood after Omacor administration (top) and the association of risk of sudden death with the whole blood EPA+DHA level (bottom, data from Albert CM et al.). The vertical broken line suggests that 1g/day Omacor (as in GISSI-P and GISSI-HF) was associated with a reduced risk of sudden death. Further work is required to assess to what extent heart failure and chamber dilatation *per se* reduce the blood EPA+DHA level (9).

References

1. Marchioli R, Barzi F, Bomba E, Chieffo C, Di Gregorio D, Di Mascio R, et al. Early protection against sudden death by n-3 polyunsaturated fatty acids

after myocardial infarction: time-course analysis of the results of the Gruppo Italiano per lo Studio della Sopravvivenza nell'Infarto Miocardico (GISSI)-Prevenzione. Circulation. 2002;105:1897-903.
2. Dietary supplementation with n-3 polyunsaturated fatty acids and vitamin E after myocardial infarction: results of the GISSI-Prevenzione trial. Gruppo Italiano per lo Studio della Sopravvivenza nell'Infarto miocardico. Lancet. 1999;354:447-55.
3. Marchioli R, Avanzini F, Barzi F, Chieffo C, Di Castelnuovo A, Franzosi MG, et al. Assessment of absolute risk of death after myocardial infarction by use of multiple-risk-factor assessment equations: GISSI-Prevenzione mortality risk chart. Eur Heart J. 2001;22:2085-103.
4. Rupp H, Wagner D, Rupp T, Schulte LM, Maisch B. Risk stratification by the "EPA+DHA level" and the "EPA/AA ratio" focus on anti-inflammatory and antiarrhythmogenic effects of long-chain omega-3 fatty acids. Herz. 2004;29:673-85.
5. McLennan P, Howe P, Abeywardena M, Muggli R, Raederstorff D, Mano M, et al. The cardiovascular protective role of docosahexaenoic acid. Eur J Pharmacol. 1996;300:83-9.
6. Guallar E, Sanz-Gallardo MI, van't Veer P, Bode P, Aro A, Gomez-Aracena J, et al. Mercury, fish oils, and the risk of myocardial infarction. N Engl J Med. 2002;347:1747-54.
7. Poole-Wilson PA, Swedberg K, Cleland JG, Di Lenarda A, Hanrath P, Komajda M, et al. Comparison of carvedilol and metoprolol on clinical outcomes in patients with chronic heart failure in the Carvedilol Or Metoprolol European Trial (COMET): randomised controlled trial. Lancet. 2003;362:7-13.
8. Tavazzi L, Maggioni AP, Marchioli R, Barlera S, Franzosi MG, Latini R, et al. Effect of n-3 polyunsaturated fatty acids in patients with chronic heart failure (the GISSI-HF trial): a randomised, double-blind, placebo-controlled trial. Lancet. 2008;372:1223-30.
9. Rupp H, Rupp TP, Alter P, Maisch B. Inverse shift in serum polyunsaturated and monounsaturated fatty acids is associated with adverse dilatation of the heart. Heart 2009, in press, doi:10.1136/hrt.2009.176560.

OPTIMIZING ANTI-THROMBOTIC THERAPY IN ACS

Low molecular weight heparin Enoxaparin in acute coronary syndrome patients transitioning to catheterization and percutaneous coronary intervention

Marc Cohen, *Newark Beth Israel Medical Center, USA*

A large fraction of patients (pts) with ACS will transition to an invasive strategy, cardiac catheterization and percutaneous coronary intervention (PCI). Can pts treated in the Emergency Department with subcutaneous enoxaparin, based on older trials such ESSENCE and TIMI 11B, and also on platelet inhibitors, transition to PCI safely and effectively?

In SYNERGY 9978 patients presenting with high-risk ACS were randomized to receive enox versus UFH.

Overall, 4687 (47%) patients had PCI a median of 22.6 (6.4, 48.6) hours after randomization. Clopidogrel was administered in 62.9% (upstream 30.5%) and GP IIb/IIIa antagonists in 57.3% of patients (upstream 23.4%). There were no differences between LMWH vs UFH, with regard to the primary efficacy endpoint of death and myocardial infarction (MI) at 30 days, or stent thrombosis. Thrombus on the guide wires was very rarely observed. There was no increase in GUSTO severe bleeding with LMWH but TIMI major bleeds with LMWH including all CABG bleeds to day 30.

More recent data derived from the PCI subgroup of ExTRACT-TIMI-25 further support a safe and effective role for *consistent* therapy with enoxaparin from the ED through to catheteriation and PCI. Lastly, the STEEPLE trial, and the ongoing ATOLL trials are providing more valuable data on the role of enoxaparin as a substitute for UFH in the Cardiac Cath Lab**.**

RESUSCITATION SCIENCE 2009

Therapeutic hypothermia after cardiac arrest

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Cardiac arrest carries a greater than 90% mortality rate. Despite the development of pharmacologic therapies for cardiac arrest, and improved access to electrical defibrillation this mortality has not declined significantly over the past few decades.

In addition, many of the few survivors following hospital discharge exhibit continued neurological impairment due to anixoc encephalopathy.

A number of landmark studies over the past few years have demonstrated that coronary patients after cardiac arrest can improve their outcome. Based on two randomized prospective trials that demonstrated improved neurologic outcome in patients managed with induced hypothermia (32^0-34^0C) for 12-14 hours. The ILCOR of AHA recommended induced hypothermia for cardiac arrest victims with VF.

Since these recommendations were published, the translation of this knowledge and recommended practice has been limited.

During the presentation the current evidence on the beneficial effect of hypothermia after VF and non VF cardiac arrest and its use in North America, Europe and Israel will be discussed.

Quality control in resuscitation: feedback to the user

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Both lay and professional rescuers have considerable difficulties to maintain the quality of CPR according to the Guidelines for Resuscitation. At the same time it has been demonstrated that there is a clear relationshup between the quality of CPR (in particular performance parameters as rate and depth of chest compressions, completeness of relaxation, short interruptions for ventilation etc.) and the short term outcome of a resuscitation attempt. Also, post resuscitation feedback to rescuers helps to improve their performance. Furthermore, rhythm analysis during CPR without interruption of chest compressions is becoming feasible.

New technical applications that monitor this performance during CPR and give immediate feedback to the rescuer are being developed and have been implemented in manual defibrillators and AEDs. Their potential value but also possible drawbacks will be discussed. Also the usefulness of recognition of recurrence of ventricular fibrillation during CPR will be discussed.

Pre-hospital pharmacological management

Ronen Jaffe, *Cardiology Department, Lady Davis Carmel Medical Center, Haifa, Israel*

Out-of hospital cardiac arrest is a significant health care problem with an incidence of 55/100,000 person years. In most adult cardiac arrests the initial rhythm is ventricular fibrillation (VF) or pulseless ventricular tachycardia (VT), however deterioration to asystole or pulseless electrical activity occurs rapidly. Even when effective CPR and early defibrillation are employed survival is around 4-9%, and many survivors are neurologically impaired. Several pharmacological agents have been proposed in order to improve survival. Pharmacological strategies include vasopressors for enhancing cerebral and coronary perfusion pressure during CPR, antiarrhythmics for termination of VT/VF, thrombolysis targeted at potential thrombotic etiologies and metabolic interventions to facilitate an optimal metabolic environment for recovery. Assessment of drugs has been based on animal studies, non-randomized human case series and randomized trials comparing different medications, however only randomized placebo-controlled trials with full neurological and functional recovery as a primary endpoint can give clinically meaningful data regarding efficacy. Epinephrine is the most commonly used vasopressor however no placebo-controlled trials have been performed. Vasopressin has similar efficacy to epinephrine. Lidocaine was routinely used in patients with VF despite the lack of placebo-controlled trials. Recently amiodarone was shown to increase survival to hospital admission compared to both lidocaine and placebo. Aminophyline, isoproterenol, thrombolysis and bicarbonate have no proven efficacy. Currently pre-hospital management of patients with sudden cardiac arrest should focus on effective CPR and early defibrillation.

EuReCa: Towards a web-based European registry on cardiac arrest and resuscitation

Leo Bossaert, *ERC Cardiac Arrest Registry Task Force, University of Antwerp, Belgium, European Resuscitation Council*

Introduction

Cardiac Arrest (CA) is the first cause of death in Europe and North America. However, precise data about the overall incidence of CA are not available, because only few European countries have a reliable and objective registries on CA and resuscitation in place, collecting comprehensive good-quality data on epidemiology, emergency medicine services (EMS) system, process and outcome. In other registries the collected information is limited to a hospital, a city or a region, is limited in time, or is related to a specific pathology or to a specific research project. As a result, the current estimation of the incidence of CA is an extrapolation from these fragmented data, and the medical community lacks a global perspective on the incidence of CA, on the implementation of resuscitation measures and on the outcome from CA at the European level.
The situation in North America is similar and today a more global registration of CA is being intiated through the ROC (out-of-hospital) and the NRCPR (in-hospital) registries.

Recently, the ERC has formally decided that the development of a European Registry on Cardiac Arrest (EuReCa) is to be given high priority in its strategic planning. A Steering Committee was installed and started with the planning of EuReCa.

The objectives of EuReCa include:

- to promote comparative research on current practice at different national levels;
- to extract examples of best practice and to identify benchmarks; to develop appropriate IT Tools for data collection and communication;
- to improve internal/external quality control;
- to take into account legal issues related to the communication of clinical data;
- to set a minimum European standard and
- to promote EuReCa for use in a maximum number of European countries.

Principles of the EuReCa registry

The outcome from resuscitation after CA depends on system variables, patient variables and process variables: interventions, patient characteristics, EMS structures and bystander involvement.

In the early 1990s the Utstein Style was developed to understand the elements of resuscitation and for international benchmarking. Since then this definition of data serves as a common base for numerous studies, analyses and registries. Currently, cardiac arrest or resuscitation registries constitute the most

comprehensive tool to describe structural, procedural and outcome quality. Many European national and regional data collection systems for out-of-hospital and in-hospital resuscitation have adopted the Utstein nomenclature. The coordinators of these model registries agreed to actively contribute in the EuReCa project. Today the consortium of European interested National Resuscitation Councils includes already more than 20 countries.

The key purpose of the ERC EuReCa registry is to improve quality and outcome of resuscitation for circulatory arrest in Europe. EuReCa is intended to enable Europe-wide comparisons and analyses of out-of-hospital and in-hospital resuscitations; furthermore it shall, under the umbrella of ERC, create a framework for co-operation throughout Europe. Specific differences between countries shall be recorded and analysed in comparison to the entirety.

- EuReCa will serve as a tool to analyse local chains of survival and to compare with those of other participants. EuReCa shall give feedback to the users on their activities and results and thus provide stimulation for optimisation as well as confirmation regarding successful approaches.
- EuReCa will serve as a benchmark tool for all members, enabling guidance by the most experienced teams.
- As a monitor EuReCa will assess the quality of the chain of survival and document the strong and the weak links in the chain.
- EuReCa will evaluate the implementation of the latest guidelines and allow for statements about their use and about changes concerning outcome.
- EuReCa will serve as a tool for identifying the best approach for improving outcome. This may differ per country, dependent on the weakest links as well as on financial and organisational limitations.
- A strong relationship between EuReCa and national registries is essential:
- EuReCa will be an independent registry based on the existing national registries. Data communication with the EuReCa registry will be developed for each existing national CPR/CA registry, with an import model for those registries being able to export pre-defined data sets.

The autonomy of the national registries will be respected and they will also assume responsibility for quality. ERC will offer assistance in assuring adequate data quality.

Each registry decides whether or not they contribute their data to EuReCa.
For countries without a national registry EuReCa shall offer a template to cover this.

A national team of co-ordinators consisting will be established in each participating country. They represent the different contributing organisations. This group designates a national co-ordinator (NCO) representing the country/registry in EuReCa.

Special attention will be given to the complex concerns related to national specifications on law and privacy.

Participation in EuReCa will be driven by quality criteria and not by quantity criteria.

Description of the data set

The EuReCa data set refers to the internationally acknowledged specifications of the Utstein style protocol. The EuReCa steering committee has decided on standardisation of essential key data. This may require some minor modifications in the national registries to enable export to the EuReCa database.

The data set is divided into an out-of-hospital and an in-hospital part, which may be recorded and analysed separately. Out-of-hospital EuReCa should collect all cases of cardiac arrest in which an EMS system has been called. EuReCa will include all attempted CPR cases or the reasons for no-CPR by the EMS system (futile, no cardiac arrest, DNAR-Order). In-hospital cardiac arrests for which an emergency team has been alerted should be recorded as well.

• system variables	population served
	EMS system
	dispatch CPR
• patient variables	CA confirmed
	CPR attempted
	aetiology
	place
• process variables	witnessed
	bystander CPR
	rhythm
	AED use
	EMS intervention
	essential times: call-arrival-ECG-shock-ED
• outcome variables	ROSC
	admission hospital
	discharge-death

Conclusion

The Executive Committee of the ERC has decided in 2008 that "a European Cardiac Arrest Registry should be in place within two years from now. It was proposed to name the registry "EuReCa" (European Register of Cardiac Arrest). "

Key References

1. Atwood C, et al. Incidence of cardiac arrest in Europe. Resuscitation 2005; 67:75-80

2. Böttiger BW, et al. Thrombolysis during resuscitation for out-of-hospital cardiac arrest.TROICA Trial Investigators. N Engl J Med. 2008;359:2651-62.
3. Fredriksson M, Herlitz J, Nichol G. Variation in outcome in studies of out-of hospital cardiac arrest: a review of studies conforming to the Utstein guidelines. Am J Emerg Med 2003;21:276-81.
4. Fox K, Goodman S, Anderson F, et al. From guidelines to clinical practice: the impact of hospital and geographical characteristics on temporal trends in the management of acute coronary syndromes (GRACE). Eur Hear J 2006; 24:1414-24
5. Fries M, et al. Incidence of cross-border emergency care and outcomes of cardiopulmonary resuscitation in a unique European region. Resuscitation 2007;72:66-73.
6. Gräsner JT, et al. A national resuscitation registry of out-of-hospital cardiac arrest in Germany: A pilot study. Resuscitation 80, 199-203, 2009
7. Herlitz J, et al. Resuscitation in Europe: a tale of five European regions. Resuscitation 1999;41:121-31
8. Hypothermia after Cardiac Arrest Study Group (2002) Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. N Engl J Med 346: 549–556
9. Jacobs I, et al. Cardiac arrest and cardiopulmonary resuscitation outcome reports: update and simplification of the Utstein templates for resuscitation registries. Resuscitation 2004;63:233-49.
10. Kalla K, et al. Implementation of guidelines improves the standard of care: the Viennese registry on reperfusion strategies in ST-elevation myocardial infarction (Vienna STEMI registry). Circulation 2006;113:2398-405
11. Mandelzweig L, et al. The second Euro Heart Survey on ACS 2004. Eur Heart J 2006;27:2285-93
12. Morrison L, et al. Rationale, development and implementation of the Resuscitation Outcomes Consortium ROC epistry-cardiac arrest. Resuscitation 2008
13. Müller-Nordhorn J, et al. An update on regional variation in cardiovascular mortality within Europe. Eur Heart J 2008;29:1316-26.
14. Nadkarni V, et al. First documented rhythm and clinical outcome in in-hospital cardiac arrest among children and adults. JAMA 2006;295:50-57
15. Nichol G, et al. International resuscitation network registry: rationale and preliminary results. Resuscitation 2005;65:265-77
16. Nolan J, Soar J, Eikeland H. The chain of survival. Resuscitation 2006;71:270-1.
17. Rea T, et al. Incidence of cardiac arrest in USA. Resuscitation 2004; 63:17-24
18. Rosell F, Cardiac arrest survivors attended by out-of-hospital emergency teams in Andalucía. Resuscitation 2006;70:315
19. Tunstall-Pedoe H,et al. Estimation of contribution of changes in coronary care to improving survival, event rates, and coronary heart disease

mortality across the WHO MONICA Project populations. Lancet 2000;355:688-700.

20. Waalewijn RA, Tijssen JG, Koster RW. Bystander initiated actions in out-of-hospital cardiopulmonary resuscitation: results from the Amsterdam Resuscitation Study (ARREST). Resuscitation 2001;50:273-9
21. Wik L, et al. Quality of cardiopulmonary resuscitation during out-of-hospital cardiac arrest. JAMA 2005;293:299—304.

THE ECG: STILL A CRITICAL TOOL IN ACUTE CARDIAC CARE

Grading of ischemia in STEMI

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Professor Samuel Sclarovsky defined the "Grades of Ischemia" based on extensive observation of the dynamic ECG changes seen in patients admitted to the Cardiac Intensive Unit with ST elevation myocardial infarction (STEMI). Grade I is defined as tall peaked T waves without ST elevation. These patients are usually not considered eligible for acute reperfusion therapy. Grade II is defined as ST elevation without terminal QRS distortion, whereas grade III is defined as ST elevation with terminal QRS distortion. The definition of terminal QRS distortion is absence of S wave below the isoelectric lines in leads with baseline Rs configuration (usually leads V1-V3), and J-point/ R wave ratio above 0.5 in leads with qR configuration. To qualify for grade III, two or more adjacent leads should have ST elevation and terminal QRS distortion. Numerous retrospective analysis of single center consecutive patients cohorts and data from multicenter randomized trials around the world have repeatedly shown that STEMI patients who present with grade III have higher mortality, higher rates of reinfarction, larger final infarct size and less benefit from thrombolytic therapy. Less resolution of ST elevation was observed in patients with grade III following thrombolytic therapy or primary percutaneous coronary interventions (PPCI). Necrosis progresses rapidly over time in patients with grade III, whereas the association between necrosis and time is weak in patients with grade II ischemia. Logistic regression analysis of 1306 enrolled in the DANAMI-2 trial showed that 30-day mortality was dependent only on age for grade II patients; whereas for grade III patients, time to treatment and type of reperfusion therapy (PPCI being better than thrombolytic therapy) were independent predictors of mortality. Thirty-day mortality among grade III patients treated within 3h of onset of symptoms was 1.4% with PPCI versus 6.9% with thrombolysis. Among grade III patients treated 3-6 hours after onset of symptoms it was 13.5% and 11.8%, respectively. Among grade II patients treated within 3 hours, mortality was 2.4% and 4.0%, respectively and among grade II patients treated 3-6 hours from symptoms onset it was 5.5% versus 6.7%. Thus, it seems that mortality increases over time especiually in patients with grade III and PPCI is especially beneficial in grade III patients presenting early.

Unexplained cardiac arrest

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Unexplained cardiac arrest is an uncommon condition in the intensive cardiac care unit. Most patients presenting following successful resuscitation from an arrest, have structural heart disease or overt electrocardiographic abnormality. Cardiac arrest survivors without structural abnormality, pose a diagnostic and therapeutic challenge. Causes include but are not limited to subclinical cardiomyopathy, primary genetic "electrical" disorder, myocarditis and idiopathic ventricular fibrillation. Although implantable defibrillator therapy is usually indicated for patients who survived cardiac arrest without a reversible cause, reaching a correct diagnosis has implications regarding therapy to prevent recurrences and ragarding family members and genetic testing.

Differential diagnosis of ST elevation patterns in ACS

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The standard 12-lead ECG remains the most useful tool for the diagnosis, early risk stratification, triage and guidance of therapy in patients with acute coronary syndromes (ACS). However, the initial and the terminal part of the QRS complex, the ST-segments and the T-waves are influenced by anatomical and metabolic factors such as the “myocardium at risk”, “severity” and duration of ischemia”. Moreover, there are complex interactions between all these factors. The ECG can identify potential candidates for reperfusion therapy as well as the completeness and success of reperfusion, whereas it can also identify those patients who will have no benefit from reperfusion due to either late arrival or to non-ischemic etiologies of ECG changes. These patients may have a “pseudo” ST elevation myocardial infarction (STEAMI) or “pseudo-pseudo” STEAMI. The presence of Q waves and additional ST-segment depression and T wave inversion on the admission ECG in patients with STEAMI may provide us information regarding the potential myocardial reserves, and various ECG scoring systems are in current use for that purpose. The pattern and timing of changes in Q waves, ST-segment and T waves may all be markers of the patency status of the infarct-related artery.

ST elevation is thought to represent transmural ischemia, and has been correlated with both the “severity” of ischemia and with the size of the ischemic myocardium at risk. Several studies have tried to estimate the ischemic area at risk and final infarct size by examining the admission ECG for the number of leads with ST elevation and/or depression, or for the absolute amplitude of ST deviation. However, the results are conflicting. The best correlation between the predischarge ECG Selvester QRS score and the scores based on ST deviations at admission was found by using the magnitude of ST elevation in leads II, III, and aVF in inferior STEAMI, and the number of leads with ST elevation in anterior STEAMI (The Aldrich score). However, in patients who received reperfusion therapy, there was only a weak correlation between this score and either the ischemic area at risk or final infarct size as measured by pretreatment and predischarge technetium 99m (99mTc) sestamibi scans, respectively.

All these studies assumed that each lead represents the same amount of left ventricular myocardium, and therefore any similarly sized ischemic zone will create the same amount of ST deviation in the same number of leads, regardless of its location. However, the 12-lead ECG does not represent all myocardial regions equally. The inferior and anterior walls of the left ventricle are well represented, but the lateral, posterior, septal, and apical regions are relatively silent electrocardiographically. Moreover, ischemia in opposing regions may attenuate or augment ST deviation. For example, occlusion of a short left anterior descending coronary artery before the first diagonal branch causes ST elevation in leads I and aVL, in addition to the precordial leads, and

ST depression in the inferior leads. On the other hand, distal occlusion of a left anterior descending artery that wraps around the apex causes ST elevation in both the anterior and inferior leads. Although these latter infarcts are smaller, they cause a large amount of ST elevation in many leads. Proximal occlusion of a "wrap around" left anterior descending artery results in ST elevation only in the precordial leads, because the vectors of the high lateral zone (first diagonal branch) and of the inferior zone oppose one another. Infarcts of this large territory may be electrocardiographically indistinguishable from much smaller infarcts caused by distal occlusion of a short left anterior descending artery. This illustrates why the simple summation of ST amplitude or the number of leads with ST deviation cannot accurately estimate the size of the ischemic zone.

ST resolution following reperfusion therapy is a better predictor of prognosis and recovery of left ventricular function, as it estimates the quality of reperfusion and the return of some metabolic and electrical activity in the reperfused zone.

ECG markers of coronary and myocardial reperfusion

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Although the goal for treatment of patients presenting with myocardial infarction is restoration of coronary patency, it has become apparent that impaired myocardial tissue perfusion can be present despite restoration of normal coronary epicardial flow.

Numerous technologies such as angiographic myocardial perfusion grade (TMPG), contrast echocardiography, continuous 12-lead ST-segment analysis, signal average ECG and wavelet analysis of heart rate analysis have been used to detect true myocardial reperfusion. The ECG is a useful, feasible bedside tool for detection of myocardial reperfusion.

Numerous bedside ECG markers are associated with myocardial reperfusion:

1. Reperfusion arrhythmias as AIVR sinus bradycardia, atrial fibrillation.
2. QRS configuration changes (Bundle branch block, Q waves)
3. T wave configuration
4. ST resolution

CELL-BASED THERAPY FOR HEART REPAIR

Progenitor cells in patients with myocardial infarction: Summary of clinical trials

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Recent years have witnessed tremendous growth in research and publications in field of progenitor cells (PC). This population of cells still remains to be phenotypically defined as it shares membranal determinants with hematopoietic stem cells. One of the identifying properties of PC is their ability to transform into mature endothelial cells when grown in specific conditions.

A large body of evidence suggests that circulating PC are present in the peripheral blood, and patients with cardiovascular disorders associated with decreased angiogenesis exhibit reduced circulating numbers of these cells. These collective observations led to the hope that studying the number of circulating PC in the peripheral blood would provide diagnostic and prognostic tools in the management of several cardiovascular disorders.

However, the more exciting aspect of PC relates to their potential application as therapeutic vectors. Indeed, experimental studies have shown consistently, that local and systemic administration of PC results in salvage of ischemic and non ischemic cardiac damage induced by disturbed blood flow. These elaborate experimental studies paved the way to early design of clinical trials in humans suffering from cardiac dysfunction after acute myocardial infarction. However, the results of the studies published so far are disappointing with regard to the functional and clinical endpoints.

Current studies are aimed at identifying candidate genes that can promote better differentiation and homing of PC to obtain more efficient restoration of vascular network assembly.

BEYOND REVASCULARIZATION FOR SEVERE ANGINA

Spinal cord stimulation for refractory angina pectoris

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Despite sophisticated medical and surgical procedures, a large number of patients suffer from refractory angina pectoris. Improvement of pain relief in this category of patients requires the use of adjuvant therapies, of which spinal cord stimulation (SCS) seems to be the most promising.

Spinal cord stimulation has been extensively utilized in the treatment of conditions including complex regional pain syndrome, ischemic limb pain, failed back surgery syndrome, and angina pectoris.

Controlled studies suggest that in patients with chronic refractory angina, SCS provides symptomatic relief that is equivalent to that provided by surgical or endovascular reperfusion procedures, but with a lower rate of complications and rehospitalization. Similarly, SCS proved cost effective compared to medical as well as surgical or endovascular approaches in a comparable group of patients.

This technique is still met with reluctance by the medical community. Reasons for this disinclination may be related to incomplete understanding of the mechanism of action of SCS and the fact that SCS refers to the modulation of neuroendocrine parameters rather than to revascularization, which is currently the dominant treatment paradigm in coronary artery disease

According to the European Society of Cardiology's joint study group on refractory angina's recommendations, spinal cord stimulation (SCS) is the first choice of treatment in refractory angina pectoris.

Patients with refractory angina pectoris suffer from severe symptoms and markedly decreased quality of life. SCS treatment alleviates anginal symptoms and increases quality of life significantly in this patient group. Severe refractory angina pectoris can occur in end-stage coronary artery disease despite maximal medical and revascularization therapy. Spinal cord stimulation is an under-utilized but well-established modality for the treatment of intractable angina pain

SCS can be considered a safe and effective alternative treatment of refractory angina with a sustained improvement of anginal symptoms.

External counter pulsation therapy

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Therapeutic options for the treatment of angina pectoris in patients with coronary artery disease have improved over the past two decades. Despite these advances many patients continue to be symptomatic and functionally limited with no option for coronary revascularization. It has been reported that up to 15% of patients with angina pectoris meet the criteria for refractory angina. External counterpulsation (EECP) is a non-invasive technique that has been shown to be effective in reducing both angina and myocardial ischemia in patients with refractory angina. The system consists of three sets of cuffs arranged around the calves, lower and upper thighs of the patient. The cuffs are inflated separately at the onset of diastole producing aortic counterpulsation, diastolic augmentation and increased venous return. At the onset of systole the external pressure of cuffs is released thereby reducing peripheral resistance and providing ventricular unloading

Numerous clinical studies have shown positive response in ≥80% of patients undergoing EECP including:

1) reduction of angina class; 2) increase in exercise tolerance; 3) decrease in use of nitroglycerin; 4) increased time to ST depression on stress testing; 5) enhanced quality of life; 6) improved cardiac perfusion imaging.

Some of these studies have shown a sustained improvement as long as 5 years after treatment. Several mechanisms including promotion of collateral blood flow, improvement in endothelial function, increase in angiogenesis factors, and production of peripheral training effect are responsible for the beneficial clinical effect.

Long term follow-up to evaluate the safety of the Neovasc Reducer: A Device-based therapy for chronic refractory angina

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Objectives: To evaluate the safety of the Neovasc Reducer 3 years after its implantation in the coronary sinus of 15 patients with severe chronic refractory angina pectoris.

Background: The Neovasc Coronary Sinus Reducer is a percutaneous implantable device designed to modulate flow in the coronary sinus by establishing narrowing and elevating pressure in the CS. Increased coronary sinus (CS) pressure can reduce myocardial ischemia by redistribution of blood from non-ischemic to ischemic territories of the myocardium.
In preclinical and clinical experiments, implantation of the Reducer was proved to be safe and was associated with improved ischemic parameters. In the present study, the safety of the Coronary Sinus Reducer was evaluated 3 years after implantation in patients with refractory angina of the CS Reducer.
The Reducer, a device-based therapy as a potential alternate therapy for patients with refractory angina who are not candidates for conventional revascularization,

Methods: Fifteen coronary artery disease patients with severe angina and reversible ischemia were electively treated with the Reducer. Clinical evaluation, dobutamine echocardiography, thallium single-photon emission computed tomography, and administration of an angina questionnaire were performed before and 6 months after implantation. Cardiac computed tomography was performed 2 days and 6 months after implantation.

Results: All procedures were completed successfully. No procedure-related adverse events occurred during the peri-procedural and the follow-up periods. Angina score improved in 12 of 14 patients. Average Canadian Cardiovascular Society score was 3.07 at baseline and 1.64 at follow-up ($n = 14$, $p < 0.0001$). Stress-induced ST-segment depression was reduced in 6 of 9 patients and was eliminated in 2 of these 6 ($p = 0.047$). The extent and severity of myocardial ischemia by dobutamine echocardiography and by thallium single-photon emission computed tomography was reduced ($p = 0.004$ [$n = 13$] and $p = 0.042$ [$n = 10$], respectively).

Conclusions: Implantation of the Coronary Sinus Reducer is feasible and safe. These findings, along with the clinical improvement observed, support further evaluation of the Reducer as an alternative treatment for patients with chronic refractory angina who are not candidates for coronary revascularization.

Beyond revascularization for severe angina – cell therapy

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The quest for effective regenerative strategy to improve myocardial perfusion and function has remained a challenged. A conservative estimation is that 5-10% of patients refereeing to coronary angiography may suffer from advanced symptomatic disease not amenable for contemporary coronary revascularization. The categorization of those individuals as "no option patients" may vary between countries and institutions due to divergence of expertise and the availability of advanced technologies. In addition, cell therapy may also be considered as "adjunctive" or "complementary" strategy in patients who are candidate for partial revascularization. The overall clinical experience with cell delivery in patients with severe angina is rather limited. In this cohort, cell delivery was almost exclusively accomplished by direct, intramyocardial injection using specially developed catheter-based platform. Other approaches included direct injection during CABG surgery and transcoronary sinus injections. The main cell population being used in those studies is autologous bone marrow derived mononuclear fraction. The number of cells and number of progenitor cells being injected varied between studies. The initial experience involved small non-randomized studies, which suggested safety and feasibility along with potential improvement in clinical and perfusion parameters. Those preliminary observations were recently verified in a double blind randomized controlled study of 50 patients. Of importance, as the clinical follow-up has been limited for 6-12 months, the durability and the long-term safety is currently unknown, as well as the optimal cell type and dosing. Finally, approaches aimed to improve the angiogenic potential of bone-marrow and other tissues derived cells, may amplify the therapeutic impact of this strategy. Improved homing of injected cells may simplified delivery and enhances clinical benefit without compromising safety.

Severe angina pectoris: beyond revascularisation

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The frequency of chronic stable angina patients that are not easily amenable to revascularisation therapy is likely to escalate considering the increased prevalence of diabetes, age-related renal insufficiency, myocardial infarct survivors and the overall increasing elderly population. Although there are limited randomised controlled studies investigating the management of these patients, results from the COURAGE trial would suggest that revascularisation and optimal medical therapy are of similar efficacy in the symptomatic and prognostic management of chronic stable angina patients. Furthermore, therapeutic options for such individuals are modulated especially by the presence or absence of concomitant systolic heart failure.

While β-adrenoceptor antagonists, long-acting nitrates or calcium antagonists may improve symptoms, none are exceptionally effective. Ivabradine, which induces bradycardia without β-adrenoceptor blockade, is occasionally effective in such refractory cases, and is well tolerated in the presence of moderate impairment of left ventricular systolic function.

A number of anti-ischaemic agents have been found to relieve angina primarily by improving the efficiency of myocardial oxygen utilisation. These agents, including trimetazidine, ranolazine and perhexiline are well-tolerated by patients with both chest pain and dyspnoea. Perhexiline, a potentially hepato- and neuro-toxic agent which requires plasma drug level monitoring in the long term, remains the most effective of this group.

EARLY SECONDARY PREVENTION POST ACS

Cardiac rehabilitation 2009 - It is time to get with the guidelines

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Cardiovascular Disease (CVD) remains the leading cause of death and a major cause of physical disability. Improved diagnostic and interventional techniques as well as medical therapy have resulted in increasing numbers of CVD survivors, at a price of an increasing prevalence of CVD and disability. The prevention of subsequent coronary events and the maintenance of physical functioning in such patients are major challenges in preventive care.

However, despite the widespread use of potent and effective lipolytic and anti-hypertensive medications in recent years, the control of risk factors is still lacking. The EuroAspire III survey, revealed an increasing prevalence of obesity, diabetes, and smoking resumption and a decrease in the control of diabetes and blood pressure among CAD patients in the last decade.

The implications of these results are that a much stronger emphasis on lifestyle modification and medication compliance is required in addition to improving QOL. Changing lifestyle is not an easy task, it is time consuming and not all physicians have the knowledge and time to counsel pts about diet and exercise. Moreover, the hospital stay for ACS has now been shortened to 3-5 days, further diminishing the opportunity to counsel patients about risk reduction and exercise.

Cardiac-rehabilitation programs (CRP) were first developed in the 1960s. The focus of these programs was almost exclusively on exercise, with the main goal reconditioning after long bed rest, helping patients resume their active role in society. In the last 2-3 decades CRP evolved into Multifactorial CR/secondary prevention programs using Comprehensive Multifactorial interventions, including aggressive risk factor modification that include lifestyle modification as well as medical therapy according to guidelines. Supervised exercise training is still the cornerstone of CRP. These CRP have become an integral part of present day cardiac rehabilitation.

Thus, CR 2009 is defined as comprehensive, long-term programs involving medical evaluation, prescribed and monitored exercise, cardiac risk factor modification, education, and counseling. The goals of CRP are to limit the physiologic and psychological effects of cardiac illness, reduce the risk for CV death or re-infarction, control cardiac symptoms, stabilize or reverse the atherosclerotic process, and enhance the psychosocial and vocational status of selected patients.

The multidisciplinary CR team include: Cardiologist, nurse, exercise physiologist, dietitian, and psychologist.

The scientific benefits of CRP are extensive and compelling. These benefits include improved processes of care and risk-factor profiles as well as healthy lifestyle that are closely linked to modification of ASCVD process and subsequent mortality, morbidity and QOL.

Comprehensive CR improves exercise (EX) capacity, QOL and psychosocial well being and lessens anxiety and depression. In addition, it lessens symptoms of AP, shortness of breath and fatigue. Participation in CR results in significant risk factor modification (i.e. weight reduction, LDL and TG lowering, BP and glucose control), improving insulin sensitivity and endothelial and autonomic function.

There is strong evidence for significant reduction in CV and all cause mortality by 20-30% and morbidity with lower rate of cardiac events, need for coronary revascularizations, and hospitalizations. Multifactorial CR was shown to result in significantly less progression and more regression of atherosclerosis which parallels and is even superior to results of lipid lowering trials.

Evidence suggests that the extensive benefits of CR services are as significant in an era of widespread statin and coronary intervention use as they were in prior years. Additionally they are cost-effective. Recent large studies confirmed that CR is safe and effective in lowering mortality and improving QOL even in high risk pts such as severe CHF and elderly.

Based on the mounting evidence of CRP benefits - referral to CR is considered a class I indication. All cardiology societies, including the Israel Heart Society, have endorsed the use of CR services in persons with CVD by including CR in their practice guidelines and position papers. CRP services are included in the Israeli "Health Basket" and recognized by all medical insurances for pts post MI, CABG or valve surgery, CHF and post AICD implantation.

However, despite the extensive benefits of CR and despite the widespread endorsement of its use, CR is vastly underutilized, with only 20-30% of eligible pts participating in a CRP after a CV event. Participation of women, elderly and minorities are even lower. Reasons for this gap in CR participation are numerous, but the most critical and potentially most correctable reason is the low initial referral of patients to CRP by hospital and community physicians.

Recognizing the extensive evidence of the wide range benefits of CRP - time has arrived to get with the guidelines as we do for all class I indications and refer all CVD pts to CRP.

Early secondary prevention post ACS – High dose statins

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The main goal of statin therapy in patients with chronic coronary artery disease is to prevent disease progression and the transition to acute coronary syndrome (ACS). Numerous studies demonstrated the benefit of statin therapy in this setting and intravascular ultrasound studies showed that intensive therapy can prevent disease progression (and even induce regression). The magnitude of the clinical benefit correlates with LDL reduction. Since atherosclerotic progression is a slow process it takes years until the full benefit from statins is manifested in patients with chronic atherosclerotic disease.

The situation is different in patients with ACS – patients have at least one culprit plaque (responsible for the acute event) and many "activated" vulnerable plaques that predispose them to early recurrent events. The MIRACL trial was the first to demonstrate that 80mg atorvastatin (compared to placebo) is associated with significant reduction of cardiovascular events as early as 4 months after admission. Later, the A to Z trial compared (in the early stage) simvastatin 40mg to standard therapy and the PROVE IT trials compared 80 mg of atorvastatin to 40mg of pravastatin. Treatment with atorvastatin was associated with a significant reduction in the primary study endpoint while simvastatin was not better than placebo (at 4 months). Interestingly, the negative result of A to Z, in the early phase, occurred despite a large gradient of LDL levels between active therapy and control arm (as compared to the PROVE IT trial). Better correlation with clinical benefit in A to Z, MIRACL and PROVE IT trials was observed when the impact of therapy on CRP (as a marker of the inflammatory response) was examined. Further analysis of the A to Z and PROVE IT trials shows that the benefit from early high dose atorvastatin therapy is higher in those patients who underwent percutaneous coronary intervention (PCI). It is suggested that in order to achieve the full benefit from therapy patients with ACS should undergo early revascularization to stabilize the culprit plaque and they should also be treated with high dose statin to stabilize the additional vulnerable lesions. The early benefit from statin therapy in ACS is most likely due to the anti-inflammatory (pleiotropic) effect and it is not directly related to the lipid lowering effect. This beneficial effect was demonstrated in clinical trials only for 80 mg of atorvastatin but it is not unlikely that a similar effect will be documented also for other potent statins.

Summary: Patients with ACS are at high risk for recurrent events early after admission. Associated with exaggerated inflammatory response, these patients have vulnerable lesions in their vasculature in addition to the culprit lesion that was responsible for the acute event. The best approach to therapy is thus, PCI to stabilize the culprit and high dose anti-inflammatory statins (such as 80mg of atorvastatin) to stabilize the vulnerable plaques.

Is there still a case for routine therapy with β-adrenoceptor antagonists post acute coronary syndrome?

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The theoretical case for routine utilisation of β-adrenoceptor antagonists during hospitalisation and post admission with various acute coronary syndromes derives from experimental and clinical studies performed in the pre-thrombolytic, pre-PCI era. A number of animal studies, performed in models of total coronary exclusion, demonstrated reductions in infarct size. Furthermore a number of clinical studies performed prior to 1980 have demonstrated that long-term prognosis after (substantial) myocardial infarction is ameliorated by a range of β-adrenoceptor antagonists.

However, more recent studies cast doubt on the utility of such therapy in the absence of left ventricular systolic dysfunction. During the acute ischaemic phase of unstable angina pectoris or acute myocardial infarction, there is little evidence for symptomatic or prognostic benefit from any β-adrenoceptor antagonist. Specifically, therapy with Metoprolol in the context of acute myocardial infarction had no effect on mortality in the recent large COMMIT study. Furthermore, in patients with non-Q-wave myocardial infarction, there is no evidence for beneficial effects of β-adrenoceptor antagonists during long-term therapy. These data suggest that this should not be a component of routine long-term therapy after acute coronary syndromes.

Smoking cessation: Is there hope?

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Smoking is the biggest preventable cause of death worldwide. Cardiologists may cope with cigarettes harms daily. Most of the smokers wish to quit but less then half will succeed in the long term. Cigarette smoking involves nicotine dependence and addictive behavior. To help a quitter, the physician should address and prevent withdrawal symptoms and advise definitive behavioral interventions. Cardiologist should grasp the unique opportunity to help his patients in the quitting process. Physician who give brief advice to quit smoking, recommend pharmacotherapy and refer to smoking cessation facility, can save lives.

ACS IN WOMEN

Response to anti-aggregatory therapy : impact of gender and coronary risk factors

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Anti-aggregatory therapy with low dose aspirin, thienopyridines such as clopidogrel and glycoprotein II6/III a inhibitors plays an established role in the management of acute coronary syndromes including both ST-elevation myocardial infarction and unstable angina pectoris. While both aspirin and clopidogrel are also moderately effective in secondary prevention of ischaemic heart disease, there is currently little evidence to support their utility in primary prevention in any group of individuals.

A number of studies have suggested that therapeutic responses to all classes of anti-aggregatory agents may be diminished in females, regardless of age and co-morbidities. Furthermore, there is increasing concern that many patients, especially with diabetes and acute coronary syndromes, may be “resistant” to anti-aggregatory drug effects, notably those of clopidogrel.

The phenomenon of “true” resistance to anti-aggregatory agents, as distinct from residual aggregation on treatment, is probably rare for aspirin. In the case of clopidogrel, it reflects in part mutations of cytochrome 2C19, which limit clopidogrel bioactivation. Other mechanisms contributing to apparent resistance to anti-aggregatory agents may be initial platelet hyperaggregability, which is more common in women and impaired platelet responsiveness to endogenous inhibitors of aggregation, such as nitric oxide (NO). Platelet NO resistance has now been documented in acute coronary syndromes, stable angina, hyperglycaemia, aortic stenosis and polycystic ovarian syndrome.

Potential therapeutic approaches include potential individualisation of anti-aggregatory drug dosage and amelioration of NO resistance, for example with ACE inhibitors.

BIOMARKERS IN ACS AND ACUTE DECOMPENSATED HEART FAILURE

Natriuretic peptides – state of the art in acute cardiac care

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Natriuretic peptide (NP) levels (B-type natriuretic peptide (BNP) and N-terminal proBNP) are now widely used in clinical practice and cardiovascular research throughout the world and have been incorporated into most national and international cardiovascular guidelines for heart failure. The role of NP levels in state-of-the-art clinical practice is evolving rapidly. This paper reviews and highlights ten key messages to clinicians:

- NP levels are quantitative plasma biomarkers of heart failure (HF).
- NP levels are accurate in the diagnosis of HF.
- NP levels may help risk stratify emergency department (ED) patients with regard to the need for hospital admission or direct ED discharge.
- NP levels help improve patient management and reduce total treatment costs in patients with acute dyspnea.
- NP levels at the time of admission are powerful predictors of outcome in predicting death and rehospitalization in HF patients.
- NP levels at discharge aid in risk stratification of the HF patient.
- NP-guided therapy may improve morbidity in chronic HF.
- NP levels, combined with symptoms and weight gain represent a useful strategy to access clinical decompensation.
- NP levels are powerful independent predictors of death in acute coronary syndrome.
- NP levels may be helpful to screen for asymptomatic left ventricular dysfunction in high-risk patients.

Natriuretic peptides in acute coronary syndromes

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The role of the natriuretic peptides (NPs) in the diagnosis of myocardial volume or pressure overload, regardless of etiology, is well-established. Their role in the management of coronary artery disease is less clear. The NPs seem add to the process of risk stratification of patients with acute coronary syndrome as part of a multimarker approach during the acute event, but the cost-effectiveness of this approach is unproven. The NPs may have a role in patients with suspected active coronary artery disease with no elevation of myocardial injury-associated biomarker, such as troponin or creatine kinase MB. In addition, NPs could be of prognostic value when measured long after the resolution of the acute event. The timing of NP sampling seems to impact on the clinical importance of the result of NPs levels. These and other aspects of NPs testing in acute coronary artery disease will be presented and discussed.

Emerging Biomarkers in Acute Heart Failure

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Acute heart failure (AHF) is defined as new onset or gradual or rapidly worsening HF signs and symptoms requiring urgent therapy.

Irrespective of the underlying cause (e.g., ischemic event) or precipitant (e.g., severe hypertension), pulmonary and systemic congestion due to elevated ventricular filling pressures with or without a decrease in cardiac output is a nearly universal finding in AHF.

Over 1 million hospitalizations with a primary diagnosis of HF occur each year in the U.S. and as a diagnosis at hospital discharge; heart failure has tripled over the last three decades. This trend will likely continue. Hospitalization for AHF is important predictors of post-discharge mortality and readmission in patients with chronic HF.

Clinical prognostic markers in AHF, such as age, systolic blood pressure and ischemic etiology were found to be prognostic in some studies. However, many other clinical variables were found to less competent as prognostic markers.

Accordingly, various studies were done to explore the potential role of "biomarkers" in AHF. Albeit the broad and possible too inclusive definition of "biomarkers", several widespread markers including: Natriuretic peptides, Troponin, renal function tests, serum sodium are used. In addition, some less familiar biomarkers as ST2 were shown to have prognostic and clinical implications in AHF.

In the current presentation, we will discuss the supportive data regarding the role of biomarkers in AHF.

Multimarker approach in heart failure

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A. Diagnosis
   1. Possible value of conjoint use of ANP and b type natriuretic peptides
   2. Possible value of conjoint use of b type natriuretic peptides and proBNP
B. Prognosis
   1. Conjoint use of natriuretic peptides and cTn
   2. Conjoint use of natriuretic peptides and copeptin
   3. Conjoint use of natriuretic peptides and death markers such as ST2, GDF-15, proADM
C. Monitoring therapy
   1. Natriuretic Peptides and cTn
   2. Conjoint use of b type natriuretic peptides and proBNP

Although the majority of emphasis today has been on the b type natriuretic peptides, multiple new markers have been developed. Some mimic the diagnostic abilities of the b type natriuretic peptides and some could be synergistic diagnostically. In addition, some of the so called death markers are more predictive than the b type natriuretic peptides in identifying those at risk for mortality because they are stimulated by more than simply those stimuli that evoke a response in b type natriuretic peptides. The initial forays into using b type natriuretic peptides to guide therapy have had mixed success. Thus, some of these other markers may provide a better platform for what should be a fruitful approach.

PRE-HOSPITAL REPERFUSION

Pre-hospital care: a European perspective

Marco Tubaro, *ICCU, San Filippo Neri Hospital, Rome, Italy*

The pre-hospital phase and particularly the first hours are the most critical in STEMI care, both because the patient is liable to cardiac arrest and because the delay in treatment is inversely proportional to the degree of myocardial salvage and the gain in lifes saved.

Patient delay is the first key step in STEMI treatment, together with the call to the Emergency Medical System (EMS) and consequent triage and dispatch. The ambulance service has a pivotal role, not only in patient trasportation, but in pre-hospital diagnosis and treatment.

The pre-hospital registration and interpretation of the ECG is another key step in the process: the ECG can be interpreted on-site by paramedics or physicians on board or transmitted to a cardiological institution for counseling.

Reperfusion therapy is the most important treatment of STEMI and must be implemented in the fastest and most efficient way: both pre-hospital thrombolysis and PCI (primary, rescue and routine) should be employed to maximize reperfusion.

Systems of care are the basic framework of STEMI treatment, with the aim to reduce the door-to-balloon time and assure a safe trasnportation to the most suitable hospital. There are basically two network models in STEMI: the hub-and-spoke model, which is particularly useful for patients who present to the ER of a peripheral hospital; and the STEMI receiving centre (SRC) model, which applies mainly to patients who call the EMS.

Unexpectedly prolonged time delays are common in STEMI treatment and barriers to the implementation of efficient networks are frequent in all countries: guidelines recommendations should be translated into quality indicators and performance measures, taking even in account the economic imbalances and diversity in health systems in Europe.

Lack of political and administrative support is a frequent cause of failure in implementing pre-hospital programmes: full involvement of all the professionals in the field (physicians, nurses, paramedics, EMS personnel) should come along with an adequate attention of health decision makers and politicians.

DIFFICULT CHALLENGES IN THE MANAGEMENT OF THE DYSLIPIDEMIC PATIENT

The role of intensive lipid lowering prior to coronary revascularization

Yoseph Rozenman, *The E. Wolfson Medical Center, Holon, Israel*

Pathologically, coronary atherosclerosis is a diffuse disease with a variable mixture of stable vulnerable and culprit plaques. Multiple studies provide justification for statin therapy to reduce cardiovascular events and mortality in patients with stable atherosclerotic disease. Intravascular ultrasound studies demonstrated the ability of statins to prevent progression (and occasionally induce regression) of atherosclerosis, an effect that correlates with the reduction of LDL cholesterol. Intensive treatment with atorvastatin is associated with better clinical outcome in patients with acute coronary syndrome. The benefit is evident especially in those treated also with percutaneous coronary intervention (PCI). A possible explanation is that the PCI stabilizes the culprit lesion (responsible for the ACS) while atorvastatin, stabilizes the rest of the vulnerable plaques. The beneficial effect of atorvastatin in these patients correlates with its anti-inflammatory properties (as evident by reduction in CRP).

A series of recent trials examined the impact of atorvastatin loading on the early outcome of PCI. These studies clearly demonstrated very early benefit with reduction of peri-procedural myocardial damage. The benefit was demonstrated for patients with stable CAD (ARMYDA trial) and in those with ACS (ARMYDA ACS). A single 80mg dose of atorvastatin is sufficient to achieve this benefit in statin naïve patients (NAPLES II). Interestingly, the ARMYDA RECAPTURE showed that reloading with atorvastatin prior to PCI prevents peri-procedural myocardial damage even in those who are already on statin therapy. The exact mechanism by which atorvastatin prevents peri-procedural myocardial damage is not clear; it is unlikely that this effect is mediated by a change in the lipid profile so it is most likely another example of a pleiotropic effect of a statin.

In summary: Clinical benefit from statin therapy is well documented for patients with stable CAD and those with ACS. Loading of atorvastatin within 24 hours of PCI reduces peri-procedural myocardial damage. Whether this effect will translate into long term clinical benefit is still unclear.

ISCHEMIC/FUNCTIONAL MITRAL REGURGITATION IN THE CORONARY CARE UNIT

The prognostic importance of ischemic MR and overview of the new guidelines

Alexander Sagie, *Rabin Medical Center, Israel*

This presentation will focus on 4 important issues regarding ischemic mitral regurgitation (IMR): 1. The magnitude of the problem 2. The prognostic importance of IMR 3. Does combined mitral valve surgery (MVS) and CABG improve survival when compared to revascularization alone in patients with moderate or severe IMR? 4. What do the recent new guidelines tell us regarding the indications for surgical treatment of IMR?

Ischemic MR is a frequent entity represents the second leading cause of MR after MVP in the United States. Some degree of MR is found in approximately 30 percent of patients with coronary artery disease (CAD) who are being considered for coronary artery bypass surgery (CABG)(1). IMR occurs in approximately 20 percent of patients following acute myocardial infarction. In many of these patients, MR develops from tethering of the posterior leaflet because of regional wall motion abnormality due to old infarct in particular the posterior lateral wall. In most of these patients, MR is mild; however, in the small percentage with severe MR (3 percent in one large series of patients with CAD proved by coronary arteriography), it is associated with a poor prognosis (2-3). In patients with ischemic cardiomyopathy LV dilatation results in alteration of the spatial relationships between the papillary muscles and the chordae tendineae in addition to annular dilation and thereby results in IMR (1). The prognosis (morbidity and survival) of patients with CAD and IMR versus those without IMR was found to be less favorable (3-5). Grigioni et al (3) found that the mortality risk in post MI patients with IMR is higher and related directly to the degree of MR and therefore, IMR detection and quantification provide important prognostic information. Feinberg et al (5) found that even mild MR within the first 2 days of admission in patients with AMI is a significant independent risk predictor for mortality.

Optimal treatment of significant (>or=2+ grade) ischemic mitral regurgitation remains controversial, and the impact of mitral valve surgery (MVS) at the time of coronary artery bypass grafting (CABG) on early and late results is still debatable (6). Operative mortality is higher than in organic MR, and long term prognosis is less satisfactory with a higher recurrence rate of MR after valve repair (7-9)

Although several studies found direct correlation between the degree of MR and prognosis most of the studies did not found any advantage by adding MVS in patients underwent CABG (10-13).

Benedetto et all (10) in a meta-analysis on 2479 patients who underwent CABG with or without MVS found that MVS did not have advantages on late mortality and that postoperative New York Heart Association class was not significantly improved in the combined MVS group. Most surgeons nowadays commonly use additional mitral valve procedure to treat moderate or severe IMR, because it seems logical that decreasing volume overload in these patients will be favorable. However, there is not any proof that this approach is superior to a more conservative approach of not touching the mitral valve.

The recent ESC (2007) (14) guidelines are dealing separately on the issue of IMR. However, they emphasize the limited data available in the field of IMR which result in less evidence –based management guidelines. They state that severe IMR should be corrected at the time of CABG (IC). They give recommendation IIaC for correcting moderate IMR in patients undergoing CABG if repair is feasible), but emphasize that there is a continuing debate on the management of moderate IMR. The recent AHA guidelines (15) do not give separate guidelines for ischemic MR. However, they state that the indication for MVS in patients undergoing CABG with mild to moderate IMR is still not clear but there are data to indicate benefit of mitral valve repair in such patients. In summary, although it is clear that IMR is associated with poorer prognosis, more data is needed regarding the need and type of surgical intervention in patients with IMR.

References

1. Braunwald's heart diseases -8th edition –LIBBY –CH 62, page 1661-2
2. Bursi F, Enriquez-Sarano M, Nkomo VT, et al: Heart failure and death after myocardial infarction in the community: the emerging role of mitral regurgitation. *Circulation* 2005; 111:295.
3. Grigioni F, Enriquez-Sarano M, Zehr KJ, Bailey KR, Tajik AJ. Ischemic mitral regurgitation: long-term outcome and prognostic implications with quantitative Doppler assessment. Circulation. 2001 3;103:1759-64
4. Schroder JN, Williams ML, Hata JA, Muhlbaier LH, Swaminathan M, Mathew JP, Glower DD, O'Connor CM, Smith PK, Milano CA.Impact of mitral valve regurgitation evaluated by intraoperative transesophageal echocardiography on long-term outcomes after coronary artery bypass grafting. Circulation. 2005 Aug 30;112(9 Suppl):I293-8.
5. Feinberg MS, Schwammenthal E, Shlizerman L, Porter A, Hod H, Friemark D, Matezky S, Boyko V, Mandelzweig L, Vered Z, Behar S, Sagie A. Prognostic significance of mild mitral regurgitation by color Doppler echocardiography in acute myocardial infarction. Am J Cardiol. 2000 Nov 1;86(9):903-7
6. Raja SG, Berg GA. Moderate ischemic mitral regurgitation: to treat or not to treat? J Card Surg. 2007 Jul-Aug;22:362-9. Review.
7. Glower DD, Tuttle RH, Shaw LK, Orozco RE, Rankin JS. Patient survival characteristics after routine mitral valve repair for ischemic mitral regurgitation.J Thorac Cardiovasc Surg. 2005 ;129:860-8.

8. Seipelt RG, Schoendube FA, Vazquez-Jimenez JF, Doerge H, Voss M, Messmer BJ. Combined mitral valve and coronary artery surgery: ischemic versus non-ischemic mitral valve disease. Eur J Cardiothorac Surg. 2001 Aug;20:270-5.
9. Bouchard D, Pellerin M, Carrier M, Perrault LP, Pagé P, Hébert Y, Cartier R, Dyrda I, Pelletier LC. Results following valve replacement for ischemic mitral regurgitation.Can J Cardiol. 2001;17:427-31.
10. Benedetto U, Melina G, Roscitano A, Fiorani B, Capuano F, Sclafani G, Comito C, Nucci GD, Sinatra R. Does combined mitral valve surgery improve survival when compared to revascularization alone in patients with ischemic mitral regurgitation? A meta-analysis on 2479 patients. J Cardiovasc Med (Hagerstown). 2009 ;10:109-14.
11. Trichon BH, Glower DD, Shaw LK, Cabell CH, Anstrom KJ, Felker GM, O'Connor CM. Survival after coronary revascularization, with and without mitral valve surgery, in patients with ischemic mitral regurgitation.Circulation. 2003; 9;108 Suppl 1:II103-10.
12. Di Pede F, Buja P, Millosevich P, Grassi G, Celestre M, Zuin G, Marchetti C, Pizzi G, Antonello M, Bindoni L, Raviele A. Moderate-to-severe ischemic mitral regurgitation and multivessel coronary artery disease: Impact of different treatment on survival and rehospitalization.J Cardiovasc Med (Hagerstown). 2006 ;7:731-6..
13. Kang DH, Kim MJ, Kang SJ, Song JM, Song H, Hong MK, Choi KJ, Song JK, Lee JW. Mitral valve repair versus revascularization alone in the treatment of ischemic mitral regurgitation. Circulation. 2006 Jul 4;114(1 Suppl):I499-503.
14. Vahanian A, Baumgartner H, Bax J, Butchart E, Dion R, Filippatos G, Flachskampf F, Hall R, Iung B, Kasprzak J, Nataf P, Tornos P, Torracca L, Wenink A; Task Force on the Management of Valvular Hearth Disease of the European Society of Cardiology; ESC Committee for Practice Guidelines. Guidelines on the management of valvular heart disease: The Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology. Eur Heart J. 2007;28:230-68.
15. Bonow RO, Carabello BA, Chatterjee K, et al: ACC/AHA 2006 guidelines for the management of patients with valvular heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (writing committee to revise the 1998 guidelines for the management of patients with valvular heart disease) developed in collaboration with the Society of Cardiovascular Anesthesiologists and endorsed by the Society for Cardiovascular Angiography and Interventions and the Society of Thoracic Surgeons. *J Am Coll Cardiol* 2006; 48:e1.

NURSING SESSION III: THE MANY FACES OF HEART DISEASE

Using measurement to improve care of ACS patients: Audit and registries

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Ensuring patient care is optimal requires consistent application of evidence-based guideline recommendations to individuals and populations. Measurement of adherence to guideline recommendations is key, and registries play a pivotal role in assessing the quality of care at the individual, institutional and system levels of health services. This presentation will address the impact of large registries in improving care, benchmarking institutional and national performance and providing valuable insights into the application of the results of clinical trials in the ‘real world’ setting. The role of ‘nursing metrics’ in ensuring that dignity and safety are safeguarded alongside traditional process measures such as ‘time to reperfusion’ will also be addressed.

Establishing an integrated heart failure management approach: Can we afford not to?

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The prevalence of Heart failure (HF) is increasing worldwide. HF is associated with increased mortality, frequent hospital admissions, impaired Quality of Life and high costs. We report about a unique disease management (DM) program which will be delivered by Maccabi Health Care services in collaboration with Sheba Medical Center and Gartner institute through specialized HF centers in conjunction with a designated call center

Objectives:
1. Maintain and improve quality of life and prevent hospital admissions.
2. Decrease mortality
3. Reduce costs

Design: The program includes delivery of healthcare service through regional heart failure centers, a designated call center and tele-monitoring. The program is intended for high risk patients such as having a low functional capacity The DM model includes a multi-diciplinary HF specialized teams who will work side by side with the primary care physician.

The multidisciplinary team in the regional HF centers will carry out the initial medical and nursing assessments and tailoring of individualized treatment plan, by structured care processes and standardized protocols. Nurses working at the call centers will be the case managers (CM) of the patients. CM will provide counseling for healthy lifestyle and up-titration of medical treatment, follow patient's compliance and treatment side-effects, and provide counseling in case of acute medical events (i.e. patients urgent calls, abnormal tele-monitoring readings). The frequency of follow-up visits in the HF regional centers will be decided according to the patient's clinical state. The program will be evaluated within the framework of a randomized controlled trial.

Program Significance: This unique HF DM model is a novel treatment strategy in Israel. If proved to be effective, it offers an opportunity for improving health outcomes in HF patients. Establishing a national heart failure treatment program may serve as a model for coping with other severe chronic illnesses in Israel.

ICCU nursing at the doorstep: The case for nursing input into triage of suspected cardiac emergencies

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Overcrowding in emergency departments (EDs) is an increasing problem in Western nations, resulting in the need to divert ambulances to other facilities, impaired ability of emergency department personnel to function appropriately, and several studies have reported increased mortality during periods of ED overcrowding. Overcrowding generally results from the failure to access inpatient beds for those patients requiring admission that have been in ED for a prolonged period of time. This problem is commonly referred to as “access block”.

Cardiac-type symptoms (chest pain, dyspnoea, dizziness, syncope, palpitations) account for around 25% of all emergency department (ED) presentations. Chest pain (CP) is one of the most common presentations to EDs, with the spectrum of causes ranging from insignificant to life-threatening. Limited hospital bed availability and ED overcrowding lead to increased pressure on ED staff to make rapid and accurate decisions regarding diagnosis and management of patients with CP, while limiting numbers of admissions.

Cardiac-trained nurses have been introduced into some EDs in an attempt to reduce length of stay (LOS) for patients with CP in ED, although there is minimal evidence to support the efficacy of this strategy. The idea of cardiac-trained nurses in the ED came to the forefront in the early 1990’s as a strategy for reducing time to treatment for patients requiring thrombolysis. The need to facilitate the movement of patients with CP through the ED (either via admission to the wards or discharge from ED) has rekindled interest in the placement of a cardiac-trained nurse in ED with extended roles in cardiac assessment, including undertaking exercise stress testing (EST).

Several centres are beginning to report data on nurse-led EST in ED for low-risk patients with CP, but evidence to demonstrate that cardiac-trained nurses reduce overall LOS for patients in ED with CP remains elusive. A recent pilot analysis performed on the basis of movement in and out of the emergency department for patients with CP in the presence and absence of a cardiac-trained nurse showed no marked effect on the time course to admission or discharge, and raised issues such as suboptimal utilization of nurse expertise and medicolegal constraints against making management decisions on the basis of nurse advice. The study also illustrated the difficulty in the selection of appropriate outcome measures for assessment of strategies that have both quantitative and qualitative dimensions, with many factors impacting upon outcomes, including availability of ward beds, particularly coronary care and monitored cardiac stepdown beds, and availability of out-of-hours cardiac

investigations. Whilst reducing LOS in the ED is important, there are a number of less tangible advantages in having a cardiac-trained nurse in the ED, such as ensuring that patients who require cardiac admission are receiving appropriate care in the ED whilst waiting for a ward bed, monitoring for suspected arrhythmias that may otherwise go unnoticed, cardiovascular risk assessment and education for patients, and education and support of ED staff. These factors should not be overlooked or undervalued.

NURSING SESSION IV – ACUTE MYOCARDIAL INFARCTION AND HEART FAILURE

Takotsubo cardiomyopathy: What causes it? How do we diagnose it?

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Takotsubo cardiomyopathy (TTC) is a transient disorder characterised by acute onset of segmental systolic dysfunction of the left ventricle (predominantly the peri-apical region) that mimics acute coronary syndrome in the absence of significant epicardial coronary artery disease. First described by Sato et al in 1990, the Japanese word "takotsubo" translates to "octopus pot" which describes the shape of the left ventricle during systole in the most common form of TTC, when observed in imaging studies.

TTC predominantly (but not exclusively) affects post-menopausal females, and in the majority of cases, has been diagnosed immediately after severe physical or emotional stress or trauma, and thus is often referred to as "broken heart syndrome." Initial studies observed that many of these cases were associated with evidence of substantial increases in catecholamine secretion, and it has been suggested that this is in part a "catecholamine cardiomyopathy". However, the apparent increase in incidence in summer, the regional distribution of hypokinesis, the predominant occurrence in post-menopausal females and the tendency towards recurrence in some patients all remain unexplained.

At present, the majority of cases of TTC are diagnosed "by accident". Among currently detected cases, the clinical presentation of TTC is often indistinguishable from that of acute coronary syndrome. ST-elevation is often present on the ECG and the patient often has chest pain and/or symptoms of heart failure. Troponins are elevated in around 90% of patients presenting with TTC, although generally to a lesser degree than with acute ST-elevation myocardial infarction (STEMI). However, there are some subtle differences from "conventional" acute coronary syndromes. Resting ECGs often show marked QTc prolongation. Plasma levels of BNP and N-terminal pro-BNP are often markedly raised, even in the absence of overt pulmonary oedema. Echocardiography reveals typical wall motion abnormalities and sometimes a mid-cavity pressure gradient. However, it is clear that TTC is still substantially under-diagnosed and better diagnostic algorithms are needed.

Although patients may be severely ill during the early clinical states of TTC, and death occurs in a few cases, apparent complete recovery of left ventricular (LV) function over a period of several weeks occurs in the majority of patients. However, recent investigations have established that abnormal myocardial structure and metabolism may persist for at least several months in such

patients, and that there is a substantial risk of recurrence of clinically overt left ventricular dysfunction during this period. Acute complications occur in around 20% of patients and include heart failure, cardiogenic shock, left ventricular thrombus formation, tamponade and arrhythmias.

Thus TTC represents a substantially mysterious, but not uncommon or benign, cause of both acute and recurrent cardiac emergencies in ageing females. Improved diagnostic methodology and an understanding of pathogenesis and natural history are required if effective treatments are to be developed.

Patient after LVAD Surgery

N. Schneider-Mendlowitz, I. Rivkovsky, *Israel*

Background: Heart failure is defined as inability of the heart to effectively pump oxygenated blood to meet the metabolic demands of the body. Ventricular assist devices (VAD) are used as a bridge to cardiac transplantation by providing mechanical circulation when the natural heart cannot maintain adequate cardiac output. With proper training, VAD patients can leave the hospital and wait for their transplant at home restoring their quality of life . Before discharge, patients must learn to care for themselves and manage their life supporting equipment. Sheba- VADS/ Israel. There was no discharge plan for VAD patient intended to community setting.

Method: Case study of creating a discharge plan for 19 years old patient with severe dilated cardiomyopathy and PHTN, 2 months after HeartMateII transplantation. Three weeks prior the discharge nurse management team started developing an evidence - based education program. Nursing staff was instructed by management team, the surgeon and Gamida company presenter regarding the postoperative surgical care and basic concepts related to device. Patient's mother started to treat exit site using sterile technique under nurse guidance and learned to identify signs of infection. Patient learned how to operate the device. A week prior the discharge family was instructed on daily basis regarding the equipment that must be carried on at all times, follow-up care, device maintenance and troubleshooting. Community services which are not experienced with VAD's were instructed by the management team and Gamida presenter. SHL Telemedicine provided monitoring, call center and emergency services.

Conclusion: In order to assure safe VAD patient discharge there's a need to structured plan based on education of patient and his caregivers, nursing staff and community services. Patient must feel confident about his ability to care for himself and availability of emergency resources.

Can effective nurse:physician communication affect patient outcome?

Julie Benbenishty, *ICU, Hadassah Medical Center, Israel*

Clear communication is imperative if teams in any industry expect to make improvements. An estimated 85% of errors across industries result from communication failures. These failures between staff in the medical industry could lead to patietn motality. Arecent study showed that less than 10% of ICU residents and nurses understood the goal of care for their patients.

For optimal patient outcomes, physicians and nurses should work together, communicating goals of treatment, long and short term, predicted outcomes and therapy duration, alternative clinical pathways, and communication tactics with patients and their families.

How has the relationship between nurses and physicians, particularly in the ICU setup, evolved over the years?

Physicians and nurses share the common goal of maximizing the health and comfort of their patients. Yet, the traditional doctor-nurse relationship was not created on a collaborative platform. Traditional patterns of behavior have been that of "physician dominance and nurse deference. This type of relationship format does not promote free thinking and open communication and can cause catastrophic results. Collaborated effort leads to better patient outcome, health-care costs, provider satisfaction.

A number of trials have been published reporting an association between collaboration in intensive care units and patient outcome. There are a number of characteristics which show significance in influencing the collaborative process. These include excellent communication skills, respecting the value of colleagues' roles, the ability to share points of view and trust. However, there are many barriers which impede good communication skills, a shared trust and respect and personal capabilities for sharing professional points of view.

Can we change physician-nurse team work in order to increase effiectiveness to strive for improvement in quality of care? Frequency of team meetings single most crucial factor fostering collaborative teamwork This is an opportunity for communication to improve inter-professional relationship. We should aim for agreed goals and aims, defining roles, evaluation of performance and competency and an integration of group effort.

In conclusion the benefits of good collaboration can result in better care for the patient, patient satisfaction, staff satisfaction, reduced workloads all round, increase in patient safety and fewer fiscal demands on health care

BIOMARKERS IN ACS AND PCI

Troponin assays – what do we know

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A. Differences in sensitivity
   1. overall
   2. low end sensitivity
   3. men vs women
B. Differences depending on cut off criteria
   1. ROC value
   2. 10% CV value
   3. 99th% value
   4. rising pattern
C. Analytical interferences
   1. those that increase values
   2. those that decrease values
D. Novel high sensitivity assays
   1. goods
   2. bads
   3. are we ready

There are a large number of troponin assays currently available for use. All of them are different in terms of sensitivity and precision. Often comparisons are done which are misleading because they assess the assays across the entire range of detectable values. However, the important comparisons need to be made at the low end. It is also key to know what cut off criteria one is using as they differ markedly. In addition, all assays can suffer from assay interferences. In some cases, they increase values and in others, they diminish values. These considerations will be critically important with the new iteration of high sensitivity troponin assays.

Interpreting troponin values in patients with ACS

Joseph S. Alpert, *University of Arizona College of Medicine, Tucson, Arizona, USA; Editor-in-Chief, American Journal of Medicine*

Cardiac troponins (cTn) are now considered the biomarkers of choice for the diagnosis of myocardial injury. Elevations of blood levels of this biomarker are integral to the diagnosis of acute myocardial infarction since the release of either form of troponin (cTn, cTnT) is highly specific for myocardial injury as compared with cardiac biomarkers used in the past. Meticulous attention must be paid to laboratory techniques if troponin assays are to be reproducible and accurate and hence of value in the clinical setting. An assay-specific cTn decision limit (the 99th percentile value) is mandatory for immediate management of patients, but any detectable cTn value should be taken into consideration as it is associated with impaired clinical outcome regardless of the underlying disease. The interpretation of changes in cTn blood levels cannot be done in isolation from the clinical situation and particularly issues relating to the timing of the event being evaluated. Thus, patients with serious medical illnesses such as sepsis, respiratory and/or renal failure may suffer myocardial injury and demonstrate elevated blood troponin levels without the presence of myocardial ischemia. Such patients should not be diagnosed as having suffered a myocardial infarction. The 5 subtypes of myocardial infarction as defined in the Universal Definition of Myocardial Infarction will be discussed during this presentation.

Troponins are the preferred biomarkers for the diagnosis of myocardial necrosis, and for classification and risk stratification of patients with suspected acute myocardial infarction (AMI). Diagnostic cut off values must comply with the Universal Definition of AMI, i.e., the employment of the 99th percentile decision level of the upper reference level. Ideally, imprecision at that level should be ≤10% CV. However, even if the value is > 10% CV, the 99th percentile value still should be used for diagnostic purposes. A rising and/or falling pattern is important when patients present early. This criterion may not be met in the late phase after onset of AMI. The advent of higher sensitivity cTn assays will herald an era where there will be increased diagnostic information but also additional challenges in the interpretation of these highly sensitive values.

Inflammatory markers in acute coronary syndromes

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It is well recognised that atherogenic stimuli like hypertension, hypercholesterolemia, smoking and diabetes cause endothelial dysfunction followed by chemo-attraction of inflammatory cells, which then migrate in the subendothelium and originate the atherosclerotic plaque. The latter can remain clinically silent for years or even for ever or become suddenly unstable. In a sizeable proportion of patients the sudden transition from the asymptomatic or stable phase of coronary artery disease to acute coronary syndromes is associated to an inflammatory outburst. The sudden activation of inflammatory cells in the unstable plaque results in the release of cytokines which have the potential to cause endothelial activation, plaque fissuring and vasoconstriction followed by thrombus formation. Recent observations suggest the intriguing possibility that inflammation is not limited to the culprit stenosis, but it is widespread in the whole coronary circulation. The triggers of inflammation associated to acute coronary syndromes are probably multiple and still largely unknown. Several studies have shown that dysregulation of T cell repertoire may play a key pathogenetic role. The intensity of the inflammatory outburst associated to coronary instability, as assessed by measuring serum levels of markers of inflammation, is a powerful independent predictor of short-medium term outcome, even in the presence of optimal currently available treatment. A better knowledge of the triggers and mechanisms of inflammation is warranted to further improve the outcome in this setting.

Should we routinely measure biomarkers post PCI?

Bojan Cercek, *Cedars-Sinai Medical Center, UCLA, USA*

Cardiac biomarkers, currently largely cardiac troponins are routinely determined after an urgent/emergent PCI in patients with unstable angina or MI.

On the contrary, the need for troponin or in earlier reports creatine kinase determinations in patients with elective PCI is still debated.

In most recent meta-analysis troponin elevation was detected in 32.9% of patients after elective PCI and was associated with an increased the risk of death by 35% and the combined risk of death and myocardial infarction by 59% ($p < 0.001$).

In a separate analysis 28.7% of patients had post-PCI elevation. In 14.5% the elevation met the new criteria for PCI-related MI. During hospitalization any level of troponin elevation was associated with increased risk of MACE (OR 11.9, 3.0-42.4), while higher risk of death was present only in patients with PCI-related MI (OR 17.25, 2.7-109.6).

At 18 months though, any elevation of peri-PCI elevated troponin was associated with an increased risk of MACE (OR 1.4, 1.1-1.9) and death (OR 2.1, 1.5-3.0).

Routine post-procedural PCI determination of troponin elevation will lead to better detection of the peri-procedural myocardial damage. It will also foster more research to identify patients at risk (complex anatomy, inflammatory state) for myocardial damage during an elective procedure and help to design strategies for prevention and treatment. Recent studies suggest beneficial effect of statin loading treatment prior to elective PCI.

This author believes that the current IIa guidelines for post-PCI biomarker measurement should be elevated to Class I indication, in spite of lack of large randomized trials.

BEYOND ANGIOGRAPHY – NON-INVASIVE RISK STRATIFICATION IN ACS

The role of stress imaging post coronary intervention

A. Wolak, *Soroka University Medical Center, Israel*

The role of noninvasive stress testing (mainly stress myocardial perfusion imaging and stress echocardiography) in the evaluation and assessment of patients prior to coronary revascularization is well established . Yet, stress testing is also useful for evaluating patients with recurrent ischemia after revascularization with either percutaneous coronary intervention (PCI) or coronary artery bypass graft surgery (CABG). The role stress testing after coronary revascularization is the consequence of the possible presence of incomplete revascularization, since certain lesions or arteries may not be amenable to PCI or CABG and the late occurrence of restenosis at PCI sites, the development of new disease in bypass grafts, and the progression of native coronary disease. The aim of the talk is to focus on evidence from the current literature regarding the appropriate use of stress testing in patients who have undergone a revascularization procedure, to highlight major issues from the guidelines and to demonstrate how to apply this data in daily clinical practice.

RISK STRATIFICATION IN ACUTE CORONARY SYNDROMES

The role of new imaging modalities – CT, MRI

Ronen Rubinshtein, *Lady Davis Carmel Medical Center*, *Israel*

Risk stratification in acute coronary syndrome (ACS) may be challenging. Multislice coronary computed tomography (MSCT) and contrast-enhanced magnetic resonance imaging (CE-MRI) are two rapidly evolving non-invasive modalities that may be used for risk stratification of the cardiac patient. Improved image quality as a result of better spatial and temporal resolution with the new generation MSCT scanners, allows rapid and accurate assessment of the coronary vasculature as well as the assessment of other cardiac or non cardiac causes of chest pain. Newer scan protocols have resulted in markedly reduced radiation dose. MSCT is currently being used especially for diagnoses or exclusion of ACS. MSCT has also been recently shown to be of prognostic value in patients with chest pain. CE-MRI may be time-consuming during triage of patients with chest pain, but has a proven role in risk stratification of patient with ACS. CE-MRI allows the assessment of ventricular function and wall motion abnormalities, degree of myocardial edema (with T2 weighted imaging), and quantification of infarct size and degree of transmurality. All of which are of prognostic value. CE-MRI also provides insight into the process of microvascular obstruction and allows the assessment of infarct heterogeneity. The comprehensive assessment by CE-MRI may allow better assessment of arrhythmic risk, as well as the assessment of the potential benefit of coronary revascularization.

Stress echocardiography

Shaul Atar, *Western Galilee Hospital, Israel*

Reperfusion therapy for myocardial infarction (MI) has contributed to an unprecedented reduction in mortality due to myocardial infarction in the last three decades. Nonetheless, many patients presenting with myocardial infarction do not have the benefit of primary percutaneous coronary intervention (PPCI). Patients who are treated with thrombolysis may still have significant myocardium left in jeopardy after the index event. Indeed, the reduction in mortality after reperfusion therapy reflects the importance of myocardial salvage; reduction of total event rates requires consideration and treatment of jeopardized tissue. Although PPCI avoids these uncertainties, it remains available for a minority of infarct patients at relatively few centers worldwide.

In patients who have survived the acute episode, with or without lytic therapy, concern is often focused on vessel patency, residual stenosis, and the involvement of other vessels. In patients undergoing PPCI, although coronary angiography provides an essential “road map” for interventional procedures, it is not a particularly powerful predictor of outcome. Moreover, the coronary angiogram does not provide comprehensive information on ischemic burden, the presence and extent of residual viable myocardium, or the influence of these factors on the functional compromise of the left ventricle.

In patients not requiring intervention because of ongoing symptoms, the current medical economic climate dictates that treatment be focused on those patients whose outcome is most likely improve (i.e., avoidance of recurrent infarction, ongoing or recurrent symptoms, and cardiac death). This process of risk stratification is crucial to the cost-effective application of both noninvasive and invasive investigations.

Stress echocardiography is well validated in the diagnostic and prognostic evaluation of chronic coronary artery disease. Its application to patients after myocardial infarction provides a number of useful indicators of risk, including resting function, viability, and the threshold and burden of inducible ischemia. In the same way that indiscriminate intervention is inappropriate, however, unselective application of this and other risk stratification strategies is also inefficient. By reviewing the role of various techniques for risk assessment, this presentation seeks to provide a framework for the incorporation of stress echocardiography techniques into an integrated approach for risk stratification of the post-MI patient.

CARDIOGENIC SHOCK

Cardiogenic shock: The role of inflammation

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Cardiogenic shock (CS) is the leading cause of death in patients hospitalized with acute myocardial infarction (MI). Despite early stabilization measures, mechanical support, and urgent revascularization, lethality remains at an unacceptable high level, and we badly need new approaches in the treatment of CS.

For a long time, CS in acute MI was thought to be mainly a mechanical problem. Reduction in myocardial contractility leads to a reduction in stroke volume and cardiac output, which leads to hypotension and systemic hypoperfusion despite compensatory vasoconstriction. However it has been shown that 45% of non-survivors of CS die with a normal cardiac index (i.e., > 2.2 L/min/m2). Moreover, systemic vascular resistance levels are very variable in patients with CS, with a median in the normal range, even despite vasopressor therapy. Such an insufficient vasoconstriction may be due to systemic inflammatory response syndrome (SIRS). Inflammatory mediators can cause inappropriate vasodilation and alteration in tissue microvascularity, leading to multiorgan dysfunction syndrome. It has been demonstrated that a number of inflammatory cytokines (IL-1β, IL-6, TNF-α, soluble adhesion molecules, etc) are elevated in acute MI complicated by CS. Moreover, baseline values of IL-6 and TNF-α in MI patients predict CS. In acute MI, SIRS may be the result of 1) myocardial necrosis, 2) tissue hypoxia due to impaired perfusion, or 3) secondary infection due to bowel ischemia or catheter presence.

Excessive vasodilation due to SIRS may occur as a result of expression of inducible NO-synthase (iNOS). Small-cale studies have demonstrated that NOS inhibition improves blood pressure in patients with CS. But in the large-scale TRIUMPH study, there was no difference in 30-day mortality from all causes between patients with CS who received a non-selective NOS inhibitor, tilarginine, and those who received a placebo (48% vs. 42%; risk ratio 1,14; 95% CI 0.92–1,41).

Activation of the complement system is also a part of the inflammatory response accompanying MI. The COMMA trial demonstrated that pexelizumab, a monoclonal antibody against the C-5 complement component, decreases 90-day mortality in acute MI despite an absence of reduction in the primary end-point of MI size. It is logical to try this drug in patients with CS.

To conclude: SIRS plays an important role in pathogenesis of CS and will be a challenging subject of future studies devoted to CS pathophysiology and treatment.

Role of revascularization

Judith S. Hochman, *New York University School of Medicine, USA*

Cardiogenic shock (CS) is the leading cause of death for patients with acute MI who reach the hospital alive. The incidence of CS complicating acute MI fell from 20% in the 1960s, plateaued at ~8% for >20 years, but recently decreased to 5-7%. The most common cause is LV failure complicating acute MI, although mechanical complications remain an important etiology to recognize. Causes of iatrogenic shock should be understood and prevented: intravenous beta blocker administration to those at risk for shock (particularly those with sinus tachycardia due to unrecognized low stroke volume), excess volume loading for RV infarction, and over-diuresis for new onset pulmonary edema complicating MI.

Rapidly re-establishing infarct-related artery blood flow is essential in the management of patients with shock due to pump failure. Fibrinolytic therapy is associated with 70 lives saved at 30 days per 1000 patients treated and the addition of aortic counterpulsation (IABP) further improves this. However, early revascularization results in improved survival at 6 months and 1 year compared to initial aggressive medical therapy, including fibrinolysis and IABP. In the randomized SHOCK Trial early revascularization, performed up to 18 hours after shock onset for shock that developed up to 36 hours post MI resulted in 132 lives saved at 1 year per 1000 patients treated compared to initial medical therapy followed by no or late revascularization as clinically determined. This benefit is durable up to 11 years after MI.

Despite the 1999 ACC/AHA revised Guidelines Class I recommendation for early revascularization for patients younger than age 75, NRMI data suggest that most patients did not receive this therapy. Although the small cohort of elderly patients in the SHOCK Trial did not appear to benefit from a routine strategy of early revascularization, the nearly 20% of the elderly who were clinically selected for early revascularization in the SHOCK Registry appeared to have improved survival. The Worcester Heart Attack Study and Northern New England Registry report the same benefit of low mortality rate for the elderly selected for early revascularization. There were only 56 elderly patients in the SHOCK Trial with a surprisingly low mortality rate in the initial medical stabilization group and an apparent imbalance between the two treatment groups. The 2004 ACC/AHA STEMI guidelines give a Class II a (B level) recommendation for early revascularization of suitable elderly patients (≥75 years) in cardiogenic shock.

Despite the survival benefit of early percutaneous coronary intervention or coronary artery bypass graft surgery once shock is diagnosed the mortality rate remains high (approximately 50%) even following intervention and half of the deaths occur within the first 48 hours. This may be due to irreversible extensive myocardial or vital organ damage in some. However, new evidence suggests that there is an expanded paradigm of shock, perhaps involving a systemic

inflammatory response, complement activation, release of inflammatory cytokines, expression of inducible nitric oxide synthase (iNOS), and inappropriate vasodilation. However, despite single center studies demonstrating a survival benefit for patients with refractory CS despite PCI who received a nitric oxide synthase inhibitor, a phase 3 trial failed to confirm a benefit despite a significant rise in BP. Shock should be prevented with earlier reperfusion and novel therapies need to be developed to reduce the high mortality despite early revascularization.

ABSTRACTS

Poster Presentations

P011 Fast track evaluation of patients with acute chest pain – Results of a large scale Israeli Chest Pain Center

Roy Beigel[1], Dan Oieru[1], Orly Goitein[2], Pierre Chouraqui[1], Sella Brosh[1], Eli Konen[2], Ari Shamiss[3], Hanoch Hod[1], Shlomi Matetzky[1], *Heart institute[1], Department of Radiology[2], Executive Administration[3], Chaim Sheba Medical Center, Tel-Hashomer, and Sackler Faculty of Medicine, Tel Aviv University, Israel*

Background: Numerous patients present to the emergency department (ED) with chest pain. While in most patients chest pain represents benign complaints, in some underlie life threatening illness.

Objective: To show the utilization of a large scale cardiologist based chest pain center (CPC) and the use of different non invasive imaging modalities in the day to day routine evaluation of patients presenting to the ED with acute chest pain.

Methods: We evaluated the records of 1055 consecutive patients which presented to the ED with complaints of chest pain and were admitted for evaluation in the CPC. Patients were evaluated according to the attending cardiologist's decision by either myocardial perfusion scintigraphy (MPS), Multidetector computed tomography (MDCT), or stress echocardiography after an observation period.

Results: 108 patients did not go non-invasive evaluation and were either admitted (58 patients) or discharged (50 patients) after an observation period. Four hundred and forty five patients underwent MDCT, 444 MPS, and 58 underwent stress echocardiography. A total of 907 patients (86%) were discharged from the CPC. At average period of 236±223 days 25 patients (3.1%) of the patients have been re-admitted due to a suspected cardiac origin of chest pain and only 8 (0.9%) suffered a major adverse cardiovascular event.

Conclusions: Utilization of a cardiologist based CPC enabled patients to receive a quick, thorough, and complete evaluation for their primary complaint, thus saving precious hospitalization costs and occupancy on one hand and avoiding misdiagnosis on discharged patients on the other.

P012 Case report presenting an acute cardiac with severe complication of acute MI - formation of fissure of left ventricle

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We present a rare complication in patient with acute coronary syndrom with ST - elevation. Patient presented himself with typical chest paint and typical ECG changes - ST elevation in C1-4.

A primary coronarography was performed and proximal LAD was treated with angioplasty and stent. Other coronary branches had only insignificant sclerosis. Normal rehabilitation followed and patient was still asymptomatic. A rutine dismiss thansthoratic echocardiography had shown akinesis of apex, distal part of IVS and apical part of anterior wall with thickening of the wall and little amount of pericardial effusion. The picture of the apex looked suspicious.

Further imaging using contrast echocardiography and MS - CT was essential in making proper diagnose and decision in following treatment. The presence of two signifivant fissura - chanels in apex of left ventricule led to decision of closing that mechanical complication by surgical repair.

It was challening choice for surgeon to decide about suturing left ventricule in contex of recent thansmural ischemia.

The result was good and suture was assured by use of tissue glue. Patient was dissmissed on the 7 day in full recovery after open heart surgery.

Presented case report stress the need of looking for mechanical complication of ischemia of myocardium. Our patient had little or no symptoms. The need for quality imagining is still a great challenge. The first pathologic echo finding was subtle and non impressive, but the condition was serious and life threatening.

P013 D-dimer in diagnosis of acute thromboembolism in emergency department

Renata Hadžić-Hadžibegović; Peđa Kovačević; Zvezdana Rajkovača, *Bosnia and Herzegovina*

Pulmonary thromboembolism (PTE) is a vascular disease which attracts attention of medical expert in urgent medicine. PTE is among leading causes of morbidity and mortality and is accountable for more than 50,000 death events a year in the USA.

Total frequency (both fatal and non-fatal) is certainly higher as results of autopsy indicate (evidence show that survived PTE in 25 to 30% of routine autopsies exceed 60%) and that number is in fact higher since it is known that many thrombi melt and cannot be found even by autopsy.

Objectives of the relevant work originate from need for rapid clinic diagnosis of pulmonary embolic and they are: a) to establish value of determination of D-dimer within patients suspected to pulmonary embolic, b) to establish importance of D-dimer tests in order to shorten time until the final diagnosis determination, c) establishment of the location of D-dimer tests in diagnostic algorithm of acute pulmonary embolic in emergency aid clinics.

Research was conducted on 30 patients admitted and treated in the ER of the Health Center Banjaluka, Bosnia end Herzegovina.

Analysis of results of all the tests conducted (clinical signs and symptoms, laboratory test results, ECG graphs, X-ray of heart and lungs, Doppler echosonography, perfusion scintography), and especially D-dimer lead to the following conclusions:

1. PTE patients have increased levels of D-dimers.
2. D-dimer testing is simple, fast, available and easily performed.
3. Negative D-dimer test rules PTE out.
4. Determination of D-dimer in suspected PTE events shortens time until the final diagnosis.
5. After a clinical examination and ECG in suspected PTE events, it is necessary to do D-dimer test that may rule this diagnosis out or increase probability of PTE.

P014 Emergent invasive revascularization for non ST-segment elevation myocardial infarction: The earlier, the better

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Purpose: Optimal timing of early vs. delayed invasive strategies for non ST-segment elevation myocardial infarction (NSTEMI) remains unsettled. Since 50% of patients with NSTEMI have a totally occluded culprit artery (CADILLAC trial) and may inadvertently progress to STEMI, we analyzed the outcomes of performing immediate PCI for NSTEMI.

Methods: From January,2000 to February,2008, 653 consecutive patients with AMI underwent immediate PCI at our institution.

Results: 467(72%) patients had STEMI and 186(28%) had NSTEMI. 309(66%) and 90(48%) patients in the STEMI and NSTEMI groups had 100% arterial occlusion. Patients with STEMI had significantly higher in-hospital (8.8vs.3.2%,p=0.013), 6 months (10.5vs.4.8,p=0.022), and 1 year (11.1vs.5.9%,p=0.041) mortality rates compared with NSTEMI. Nonfatal MI (p=0.915) and TLR (p=0.854) at 1 year were not significantly different. Compared with STEMI, patients with NSTEMI who underwent immediate (≤90min.;≤2hrs;≤3hrs door-balloon time) PCI had a lower in-hospital (8.8vs.2.8%,p=0.009; 3.0%,p=0.015; 3.8%,p=0.055); 6 months (10.5vs.4.5%,p=0.018; 4.9%,p=0.031; 5.3%,p=0.067); and 1 year (11.1vs.5.7%,p=0.037; 6.1%,p=0.062; 6.8%,p=0.141) mortality rates respectively. Nonfatal MI and TLR at 1 year were not significantly different. In all patients with NSTEMI, primary PCI performed within or later than 90min, 2hrs and 3hrs after presentation, did not affect in-hospital, 6months and 1year mortality and nonfatal MI rates, but significantly influenced long-term TLR rates (p=0.005,p=0.004,p<0.001).

Conclusion: Immediate PCI should be performed in patients with NSTEMI to shorten ischemic time. Immediate PCI performed within 2-3hrs after presentation reduced in-hospital and late mortality rates compared with STEMI. The benefit was lost when PCI was performed after $2^{1/2}$-3hours of presentation. Comparing very early and late PCI in NSTEMI, very early PCI (<90min-3hours) did no harm and reduced long-term TLR rates.

P015 Novel homozygous mutation in the KCNQ1 gene associated with the Long QT syndrome

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Background: Long QT syndrome (LQTS) is a cardiac disorder characterized by the prolonged QT interval on electrocardiogram (ECG), ventricular arrhythmias, and sudden death. Clinically, two inherited forms of LQTS have been defined: autosomal dominant LQTS or Romano-Ward syndrome (RWS) not associated with deafness and autosomal recessive LQTS or Jervell and Lange-Nielsen syndrome (JLNS) associated with deafness. This study investigated the molecular pathology of family with symptoms of Romano-Ward syndrome.

Methods and Results: The Czech family with clinical evidence of LQT syndrome was analysed for mutations in all known LQT genes by use of multiplex PCR, single-strand conformation polymorphism, and DNA sequencing analyses. Novel homozygous mutation R190L/R190L in the region between transmembrane segments S2-S3 of KCNQ1 was identified in both affected sibling, the parents each carried only one of the mutant alleles and were asymptomatic with the normal native QTc but modestly prolonged QTc interval after cessation of the stress test (father - 0,5 and mother 0,48 seconds). The parents are relatives.

Both sisters had experienced syncopal episodes in the past, usually preceded by physical or emotional stress and exercise. Current ECG analysis revealed a markedly prolonged QTc (0.670 to 0.620 s), both sisters were treated by the implantation of the ICD system for a secondary preventive indication. The younger sister is also affected with the subclinical hypacusia.

Conclusion: A novel homozygous KCNQ1 mutation R190L/R190L cause RWS in a Czech family. Genotypic characterization of LQTS patients and their family members can improved gene-specific prognostic determinations and therapeutic interventions.

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P016 Beta 2 agonists and Tako Tsubo syndrome – case report

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Background: Tako Tsubo syndrome (TTS) is clinical entity mimicking an acute coronary syndrome. Although several mechanisms have been proposed, the pathogenesis of TTS remains to be elucidated. Relationship between beta 2 agonists and TTS has not been established yet.

Case report: We report the case of a 66-year old woman, with history of bronchial asthma who admitted to coronary care unit (CCU) with prolonged chest pain and shortness of breath. The chest pain followed an excessive use of beta 2 agonists in previous 24h. Physical examination revealed tachycardia, tachypnea and holo-systolic murmur. Resting ECG showed sinus rhythm and 2 mm ST elevation in II, III, aVF and V3-V6. Laboratory results revealed significantly elevated creatin kinase (CK) and CK-MB enzyme levels. Echocardiography showed apical akinesis, basal hyperkinesis, severe systolic dysfunction and severe mitral regurgitation (MR). Continuous wave Doppler echocardiography showed a high velocity jet across the left ventricular outflow tract and a pressure gradient was about 80 mmHg. Systolic anterior motion (SAM) of the mitral valve anterior leaflet was also observed. Coronary angiography revealed no significant coronary stenosis. Left ventriculography, however, disclosed apical ballooning with concomitant compensatory basal hyperkinesis and also severe MR. The patient rapidly recovered, and one week later, LVEF was documented as normal at echocardiography without any sign of regional dyssynergy, with a mild mitral regurgitation and ECG showed presence of negative T waves in previous described leads. One month later ECG was normal. After one year of follow up, myocardial stress scintigraphy was normal, and the patient was without adverse coronary events.

Conclusion: Tako Tsubo syndrome should be included in the differential diagnosis of female patients who admitted to CCU with an apparent acute coronary syndrome after excessive use of beta 2 agonist and with the absence of obstructive coronary artery disease.

P017 Ethical considerations related with the donation of organs and tissues in a multi-ethinic population

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The Spanish Autonomous City of Melilla, located in the North of Africa, has a population of 70,000 inhabitants and a very important daily flow of people through its border with Morocco. This population is composed of four different social groups: Christians and Muslims accounts for 94% and Jews and Hindus make up the remaining 6%.

The general position of these four groups related to the Organ and Tissue Donation is as follows:

- the higher is the cultural level, the better is the understanding of the concept and the acceptance of the diagnosis of brain death
- the higher is the social level the more frequent is the willingness to organ donation
- the frequency of family negative to accept donation is drastically reduced in the families of Christian faith or those with no religious affiliation, and increases significantly in families with strong cultural and religious attachments.
- the attitude towards the donation is more positive in the urban environment than in rural areas.
- increased willingness to donate can be observed more frequently in young people than in mature or old persons.
- understanding of the donation is increased in women
- increased acceptance of donation can be observed in the social circle of a transplanted patient, and in the social circle of persons who has donated organs and tissues.

Spain is the first country in the world in number of organs and tissue transplants per million of habitants. The success rate in the extraction and implantation of organs and tissues is highly successful and internationally recognized. Waiting time for recipients of organs in Spain is the shortest among the neighbouring countries.

The Hospital of Melilla is included within the National Transplant Organization of Spain and is responsible of the donor activity in its area. The donation rate in Melilla is similar to other areas of the country (40 donors / million habitants), which reflects a great solidarity.

P018 Tele-training of nursing personnel in cardiac intensive care

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Ongoing education is crucial to achieve an adequate level in the quality of care in cardiac nursing. But often, the teaching resources (courses, congresses, conferences ...) are at a great distance from the nurse who is interested in their own training. New technologies applied to telecommunications may be useful to solve this problem.

The aim of this paper is to analyze the procedures and preliminary results of the first inter-hospital educational activities in the field of cardiovascular nursing in a remote town, including the simultaneous connection via videoconference from several hospitals during the scientific sessions.

The basic equipment currently used in telemedicine consists of a video-conference camera, flat screen monitor, projector, digital imaging and computer (with software for transmission of radiographic images, electrocardiogram and vital signs). It uses the PCP-IP Internet protocol, with 5 ISDN lines which allow a transmission speed of 512 Kb / sec and a multi-band conference in real time with excellent image and sound quality. The signal is transmitted in a coded and secure format. The network currently consists of 22 nodes located in health facilities, mainly hospitals.

Tele-medicine and tele-nursing (videoconference, tele-consulting, e-learning, digital transmission of images, presentations, videos and all kind of teaching materials, ...) are tools increasingly used for continuing education in health sciences. However, this modern pedagogical resource currently has little presence in the training of nurses. The preliminary result of the first multiband inter-hospital conference has been excellent. As hospitals incorporate telemedicine units to its educational resources, assistance may be extended use of this tool in the continuing education of nursing personnel to access to cardiac teaching resources available in remote locations to their workplace and residence.

P019 Nursing workload in the air evacuation of patients with acute coronary syndrome for heart catheterization

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Cardiac catheterization is a unique diagnostic and therapeutic tool for the management of the acute coronary syndrome. But not all the hospitals have hemodynamic facilities, so it is often inevitable the transfer of patients between distant hospitals. The problem aggravates if the geographical conditions make it impossible to move by road and air transport is needed. A crucial part of patient care during transport falls on the nursing staff.

A case-control retrospective study of patients admitted to the intensive care unit of the hospital of the Autonomous City of Melilla, requiring urgent air evacuation in the years 2006 to 2007 was performed. 3 different scores were quantified for each patient in order to estimate the workload of nursing: Therapeutic Intervention Scoring System (TISS 28), Nine Equivalents of Manpower Score (NEMS) and Nursing Activities Store (NAS). Comparative analysis was conducted between the patients evacuated for hemodynamic study and the rest of the evacuated patients, using SPSS ® 14.0 (t test). A value of $p < 0.05$ was accepted as a statistical significance.

The study included 47 patients (28 men and 19 women). The mean age was 53.81 (SD: 23.94) years.

	TISS 28		NEMS		NAS	
	MEAN	SD	MEAN	SD	MEAN	SD
CARDIAC CATHETERIZATION	27.64	9.07	26.64	7.91	50.99	13.08
OTHER CAUSES	30.84	7.5	31.73	9.1	57.88	15.3
P	0.024		0.009		0.048	

All the scores studied for the nursing workload estimation showed significantly lower values in patients transferred for coronary catheterization than in the rest of the patients.

The nursing staff plays a vital task in the surveillance and treatment of critical cardiac patients during air transport. Knowing the estimated nursing workload of patients requiring cardiac catheterization can help in the planning and performance of such transfers in the best possible conditions for each patient.

P020 Left atrial size as a predictor for atrial fibrillation in patients with chronic lung disease

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Aims: Patients with enlarged left atrial size have high cardiovascular risk for develop atrial fibrillation (AF), especially in patients with chronic lung disease (CLD). Even when pneumologist s control this contingent in most of the cases the cardiologic control is aborted in absence of cardiac factor. A simple transthoracic echo-cardiography imaging can help us to predict the possibilities to determine left atrial sizes and prescribe a treatment for avoid dilatation.

Methods and Results: We performed transthoracic echo-cardiography Doppler study to 300 hundred patients with CLD, without any episode of atrial fibrillation and without history of coronary heart disease, well known for our Hospital for this Observational Cohort Study. During a follow-up of 36 months there were 35 deaths for complications of fibrosis pulmonary, Cerebral Vascular Accidents, and others no in relations with atrial or ventricular arrhythmias. Increased indexed left atrium (LA) diameter was associated with a high rate of AF.

Conclusions: In patients with Chronic Lung disease, the enlarged size of left atrium is a predictor for AF and the consequently anticoagulation and antiarrhythmic therapy. We must consider a simple Doppler study, as a protocol, for a simple measurement of cavities as a prognostic tool in this patient population.

Table 1 Basic characteristics

	Indexed LA diameter < 24mm/m2	Indexed LA diameter > 24mm/m2	P- value
Age	59 (43-75)	58 (45-70)	58,5 (39-78)
Diabetes insulin-requiring	25%	18%	1,8%
Diabetes non-insulin requiring	14%	10%	2,9%
Hypertension	23%	37%	4,5%
Glucose control	152-225	138-176	1,03%
Hyperlipidemia	37%	42%	0,7%
Smoking	21%	39%	35%
Tread mile	2% (+)	2,6% (+)	0,6%
Echo cardiography Doppler			0,3%
EF	48-63%	47-74%	
Contractility alterations	23% hipokinesia inferior; 12% hipokinesia antero-lateral	35% hipokinesia inferior; 21,5% hipokinesia apical- lateral	
Vessel disease	2,5%	7,5%	0,4%

P021 Comparision of quality of care - age and gender differences in acute pharmacotherapy in myocardial infarction patients

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Background: Current non-ST elevation myocardial infarction (MI) guidelines recommend immediate treatment with antithrombotic agents along with anti-ischaemic drugs as well as early initiation of lipid-lowering therapy. The primary objective was to compare quality of care by comparing acute pharmacotherapy provided in different age and gender groups.

Methods: The data were obtained from hospitalization records of 2,241 consecutive cases of non-ST elevation MI from years 2003-2007. We followed administration of antiplatelet drugs, anticogulation therapy, betablockers and statins within the first 24 hours after admission.

Results: We evaluated therapy of 1,054 women and 1,187 men. Women were in average significantly older (62.6 % of them over 75 yrs) than men (only 37.2 % over 75 yrs), p-value ≤ 0.001. There was an evident decrease in administration of all therapeutic agents along with increasing age (p-value ≤ 0.01). The proportion of antiplatelet therapy was highest in men under 75 yrs (aspirin in 85.9 % and thienopyridin in 36.1 %), the lowest proportion of aspirin therapy was observed in women under 75 yrs (in 75.4 %) and thienopyridin therapy in women over 75 yrs (24.8 %). In the group of women over 75 yrs aspirin therapy was provided in 81.5 %. Heparin therapy (unfractionated heparin or LMWH) was similar in all groups – from 89.1 to 91.3 %. Betablockers were administered most frequently in younger women and men (61.2 % and 61.1 % respectively), least frequently were administered in older women (47.7 %). The same difference was observed in statin therapy - 53.8 % and 52.3 % in men and women under 75 yrs, and 36.8 % in women over 75 yrs.

Conclusions: Increasing age is an important predictor of less intensive pharmacotherapy in 24 hours after admission. The highest proportion of evidence-based pharmacotherapy in all assessed variables was provided to men under 75 years. With the exception of aspirin, combination of advanced age and female gender were predictors of minor adherence to guidelines in pharmacotherapy of acute phase of non-ST elevation MI.

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P022 Elderly patients with STEMI are suboptimally treated with reperfusion therapy

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Objective: To evaluate delivery of primary reperfusion treatment (PPCI or fibrinolytic therapy) in a group of unselected patients over 75 years with STEMI primary admitted to non-PCI hospitals) and impact of this therapy on in-hospital complication and mortality.

Methods: A total of 744 consecutive STEMI pacients (mean age 66.9 ± 12.6 years) from years 2003-2006 were included into the study, and data on their demographics, reperfusion therapy and in-hospital management and complications were collected.

Results: The proportion of patients over 75 years was 30.2 %(223/744). Among the STEMI patients over 75 years the majority were women (60.5 %) as contrasted to younger age group with domination of men (72.1 %). There was a significant difference in proportion of elderly pts in reperfused group – 22.8 % and non-reperfused group – 46.1 % ($p<0.001$). For patients over 75 years, the OR for reperfusion in comparision with younger patients was 0.35. In group over 75 years there were 47.7 % patients who did not receive reperfusion treatment – primarily because of extended delay between the onset of chest pain and presentation, the other reasons were advanced age and/or multiple comorbidities. The proportion of non-reperfused patients in younger age group was significantly lower 24.0 % ($p<0.001$). The prevalent form of reperfusion in our cohort was PPCI (97%). The most frequent in-hospital complication was heart failure - in elderly patients who underwent some form of reperfusion therapy it was present in 23.2 %, and 31.4 % in non-reperfused group ($p=0.222$). Mortality rates in this age group substantially differed according to reperfusion therapy - 6.3 % in reperfused and 42.9 % in non-reperfused patients ($p<0.001$).

Conclusions: A substantial proportion (47.7 %) of patients over 75 years presenting with STEMI did not receive any primary reperfusion therapy (PPCI or fibrinolytic therapy) In comparison with younger age groups, the OR for primary reperfusion in elderly patients was 0.35. Delivery of primary reperfusion therapy offered a marked survival advantage even in patients with advanced age compared with those in whom such therapy was omitted .

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P023 Cardiac rehabilitation program provides a recovery of self-sufficiency in elderly patients after acute myocardial infarction

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Objective: Rehabilitation after acute myocardial infarction is aimed at restoring the patient to as full life as possible. This work was designed to retrospectively evaluate the effect of hospital-based cardiac rehabilitation program in myocardial infarction survivors over 75 years.

Design and methods: We studied 654 consecutive patients with myocardial infarction in age over the 75 years from years 2003-2008. Rehabilitation process (supervised aerobic exercise) was offered to all patients with myocardial infarction and started within the first day after hospital admission. An assesed outcome was ability to be discharged home from cardiology department after myocardial infarction – or need for nursing care in medical institution.

Results: From the total of 654 myocardial infarction patients over 75 years the majority were women (409 pts, 62.5 %). The most frequent cardiovascular co-morbidity was arterial hypertension (present in 82.4 %), than diabetes mellitus (47.1 %) and hyperlipidaemia (43.4 %). The mean lenght of hospital stay was 10.9 ± 8.0 days in this age group. 463 patients (70.8 %) was discharged home directly from department of cardiology, 111 patients (17.0 %) died, and 80 patients (12.2 %) required prolonged hospitalization in nursing care medical institution. In the group of myocardial infarction survivors over 75 years 85.5 % of them was capable of discharge after standard myocardial infarction therapy combined with cardiac rehabilitation program.

Conclusions: Regular hospital-based cardiac rehabilitation program after myocardial infarction (along with improvements in diagnostic and therapeutic procedures) provides a good quality of life in elderly survivors of acute myocardial infarction and facilitates restoration of their pre-infarction activity.

P024 Radiofrequency energy- a promising approach to treat mitral regurgitation

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Backgound: Mitral Regurgitation (MR) is a progressive disease that results in left ventricular failure, pulmonary hypertension and a reduced life span. New non-surgical techniques are being applied to treat MR. The mitral and tricuspid annuli are areas of dense collagen. Application of heat has shown to shrink collagen. By delivering Radiofrequency (RF) generated thermal energy, optimal shrinkage of mitral annuli can be achieved

Methods: Linear segements of mitral annulus of porcine (in situ), human (in situ) and sheep (in vivo) were treated with RF heat at 65°C, 50W for 60 seconds. All these segements were measured pre and post treatment with a pair of calibers. The annuli were segemented into 4 different sites by placing sutures. The ovine hearts were prepared in vivo, on cardiopulmonary bypass.

Results: All segements showed shrinkage. The percent shrinkage of porcine segements was 8.9±2.4%, that of humans was 8.5±3.7% and that of sheep was 11.8± 4.4%. The P value based on the t-test for means between human and porcine values was 0.4, and between human and ovine values was 0.05. The results suggested similarity in the outcome of RF energy application on these different annular tissues. The reasonably large amount of calcification in human annular tissues and the thermal response of thawed-out tissue to live collagen probably made the difference between human, porcine and ovine shrinkage.

Conclusion: By shrinking mitral annular collagenous tissue, RF energy offers a promising noninvasive approach to the treatment of MR. This study suggest that the pecentage shrinkage in various tissues are similar. Ovine and human mitral annular fibers are similarly arranged. Based on the above observation, human mitral annular treatment with RF generated heat should shrink similarly to sheep in vivo.

P025 NT-pro BNP at the emergency department in octogenarians patients with heart failure. The way to justify the hospitalization to the intensive care unit

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Chronic heart failure (CHF) is a common disease with very difficult control in older patients and a bad prognosis during a not optimized pharmacological treatment. The creation of Heart Failure Units in most of the Health Public System Hospitals have given wonderful results and represents an economical

Background and Aim of the Study: The study aim was to identify the patients with heart failure (HF) using NT-pro BNP analyses coming to the Emergency Department and the correct decision to be delivered to the Intensive Coronary Care Unit or not.

Methods: We realized a control with 500 patients visited in a period of 2006-2008 at our Emergency Department with suspected HF. Before hospitalization an ECG, Rx-thorax and blood analyse were performed. In those patients with an acute episode was performed an Echo-Cardiography.

Results: NT pro BNP levels (range: 68-100pg/mL) was associated with a 81% risk for hospitalization in patients with cardiac anamnesis, and for a range between 167-225 pg/mL was associated to other pathologies as Chronic Lung Disease, Chronic Kidney disease and Core Pulmonale.

Conclusion: We identified in NT-pro BNP peptide a wonderful tool for a prognosis no only for Acute Heart Failure but for Chronic also in primary care. Now, we can use our results for stratify the risk of our patients and take the right decision before the Hospitalization.

P026 Outcomes of intravascular ultrasound guided management of intermediate lesions in non left main coronary arteries by angiography in patients presenting with acute coronary syndrome

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Background: Multiple coronary lesions may exist in patients who present with acute coronary syndrome (ACS). There is no data on the outcomes of such patients with intermediate lesions by coronary angiogram, managed with Intravascular Ultrasound (IVUS) guidance.

Methods: All patients presenting with ACS between 10/05 and 10/08 and at least one intermediate lesion (40-70%) by visual estimation, in non-left main coronaries further evaluated with IVUS, were included. Quantitative angiography was used in selected cases. If the mean luminal area (MLA) by IVUS was <4.0 mm^2 in a 3.0 mm vessel, revascularization was performed. Myocardial infarction (MI), deaths and any revascularizations were recorded during follow up period ending 12/08.

Results: 41 (LAD-28, Circumflex-6, RCA-7, all proximal to mid vessel) patients were analyzed, 51% (21) male, 49% (20) had non-ST elevation MI (nstemi), 37% (15) diabetic, 71% (29) hypertensive with mean age of 56.2±10.9 years. By IVUS criteria, 61% (25) vessels were revascularized (20-percutaneous intervention, 5-bypass surgery). Sexes (p=0.07), diabetes (p=0.47), hypertension (p=0.52) and nstemi vs. unstable angina (p=0.44) were similar between those with and without significant IVUS findings by chi square test. Mean follow up was 20.6 (2.3-38) months. 1 patient in the non-revascularized group based on IVUS criteria developed unstable angina again in 2 months and was revascularized and 2 in the revascularized group developed nstemi at 3 and 18.5 months respectively and were managed conservatively. None of the study patients died during follow up.

Conclusions: Patients presenting with ACS who have intermediate lesions by angiography should be evaluated with IVUS as majority of them have significant lesions. Revascularization can be deferred safely if IVUS criteria are not met.

P027 Polymorphic ventricular tachycardia in acute myocardial infarction treated by thrombolysis: complication, reperfusion or iatrogenic sign?

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Quinolones therapy by the increasing QT interval may determine a type of polymorphic ventricular tachycardia named torsade de pointes. This ventricular arrhythmia could also appear after thrombolysis of acute myocardial infarction.

Case reports: A 57 years old man was admitted 2 hours after the onset of a posterior-inferior-lateral acute myocardial infarction (reinfarction) in a community hospital. He underwent pharmacological revascularization with rt-PA. In the first 24 hours after thrombolysis a sustained polymorphic ventricular tachycardia was unregistered after the second dose a quinolone recommended for a urological problem. Despite of the normal serum potassium and magnesium, QTc suffered an augmentation from 400 ms to 480 ms. Thus after beta-blocker augmentation dose and the antibiotic changing, ventricular arrhythmia disappeared without repetition during hospitalization. This ventricular tachycardia episode was considered secondary to quinolones therapy by QT interval increasing. She could also be considered a reperfusion sign or a complication of the reinfarction in the same area. One month after that during the electrophysiologic study the ventricular vulnerability was absent.

Conclusions: The arrhythmias induced by non-cardiac drugs could be an important problem in critical situations. These life menacingly iatrogenic complications probably are more frequently in daily practice.

P028 Hypertensive patients with acute coronary syndrome – clinical findings and outcomes of treatment

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Objectives: Comparison of basic clinical characteristics, extent of coronary affection, the effect of revascularization therapy and complications in patients (pts) with and without arterial hypertension (AH), hospitalized in the coronary care unit due to the acute coronary syndrome (ACS).

Methods: We examined 313 consecutive pts (group of 200 AH pts; group of 113 pts without AH) who underwent urgent catheterization and percutaneous coronary intervention (PCI) for ACS in our department during last year. Statistical analysis clinical findings and catheterization data were made.

Results: Patients with AH were significantly older (53.8±9 yrs vs 62.0±10;<0,001), significantly higher number of women (15/13.3% vs 55/27.5%; <0,03), the incidence of diabetes (4/12.4% vs 72/36.0%; <0,001), hyperlipidemia (25/22.1%, vs 96/48.0%, <0,003), previous stroke (1/0.9% vs 18/9.0% <0,01) and more frequent involvement of all three main vessels (15/13.3% vs 65/32.5%, <0,005). By contrast, the pts without AH had a more frequent one – vessel involvement (57/50.4% vs 30/15.0%; <0,0001). Although coronary artery surgery was more needed (2/1.8% vs 18/9.0%, <0.003) and hospital mortality was higher in AH group (4/2.0% vs 1/0.9%, it did not rearch statistical significance.

Conclusion: Despite the risk profile Of AH pts with ACS thanks to prompt revascularization by PCI and modern pharmacotherapy, the incidence of hospital complications, mortality and angiographic successfulness of PCI did not differ from the group of pts with ACS but without AH. Assessment of the prognosis of high risk AH pts after successful immediate therapeutic outcome reguires further follow up.

P029 Importance of pulmonary catheter in acute heart failure: Case report

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Background: The routine use of pulmonary catheter in acute heart failure today is not recommended with high class of recommendation in American and European task forces for acute heart failure. There is still a situation where only with given parametres by right heart catheterisation we are able to manage the patients properly.

Methods: The 65 year old lady with history of diabetes, hypertension and 1 month fever, was admited to our hospital with the symptoms of acute heart and respiratory failure and increased body temperature. After initial diagnostic evaluation, with normal ehocardiografic finding and laboratory testing (leucocytosis, high level of CRP and procalcytonin) and diffuse spotted areas in chest radiography, we concluded severe pneumonia. The patient was tansferred to coronary care unit. After 3 days of intensive monitoring and treatment the patient's condition suddenly went from bad to worse, with acutization of heart and respiratory failure. Because of lack of previous treatment we inserted the pulmonary catheter and find severe capilary pulmonary hypertension and borderline CO and CI ! Repeated echocardiography find this time severe acute aortic regurgitation, provoked by endocarditis destructed and prolapsed aortic cusp! The patient was intubated and emergency coronary angiography was done. We find no stenotic lesions on coronary arteries. The patient was immediately transferred to operation room, and emergency aortic valve replacement was done with successful and full recovery.

Conclusion: In this case the key point of return to right route of treatment was use of pulmonary catheter. The use of pulmonary catheter in certain cases is still necessary in differential diagnostic algorhytm of acute heart failure.

P030 Acute aortic regurgitation - challenge in acute heart failure setting

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Background: The presence of acute aortic regurgitation is not very often and it is one of the most dramatic situations in the clinical practice. It needs good organisation, minutios, acurate and prompt diagnostic and therapeutic strategy in achieving the goal of the best possible surviving rate.

Methods: During the same week the 2 consecutive patients were admited to coronary care unit with the dubious diagnosis of severe pneumonia and infective endocarditis of aortic valve respectivily, NYHA 4 class grade. After the admition, because of not adequate and accurate initial admiting diagnosis, different diagnostic strategy was done including laboratory testing, chest RTG, TTE in first and TEE in the second case and right heart catheterisation. After the diagnosis of acute aortic regurgitation was achieved, complicated with acute pulmonary oedema and low output heart state, in both of cases we have used the same method of treatment. We have performed endotracheal intubation, coronary angiography, medicamentose stabilisation with predominantly with sodium-nitropruside infusion and urgent aortic valve replacement in 3,5 hour and 4,5 hours respectivily. Both patients had complete recovery. Three months later both patients are well without having symptoms and signs of heart failure.

Conclusion: In the presence of acute aortic regurgitation, the accurate and different diagnostic procedure, brisk energetic intensive medical and finally operative treatment is essential for patient survival. In achieving this goal the rapid connection and correspondence among intensivist, interventional cardiologist and surgeon must be achieved.

P031 Different physical conditions accompanying acute myocardial infarction (AMI) and intermediate coronary syndrome (ICS)(codes 121-122/versus 120.0, ICD 10)

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In recent studies it was shown that blood coagulation and inflammation markers are raising at high geomagnetic activity; acute myocardial infarction and all his subtypes, mostly related to atheromatous plaque disruption –with higher Cosmic Ray (Proton) activity.The **aim** of this study was to explore physical conditions related to monthly distribution of AMI and ICS.

Patients and methods: the data was a part of MONICA study in Kaunas, Lithuania in years 2000-2005 (72 consecutive months). 4633 patients with AMI (2461 men) age up to 75 and 961 with ICS (654 men), (age up to 65) were studied. For comparison four indices of Solar (SA), three of Geomagnetic (GMA), Cosmic Ray (CRA) measured by Neutron activity imp/min. were used. Cosmophysical data were from space science institutions in the USA and Russia. Pearson correlation coefficients and their probabilities were obtained.

Results: monthly number of AMI and ICS show different links with the physical parameters: AMI were significantly inverse related to SA (r=-0.37, p=0.0021) and direct to CRA (Neutron) activity (r=0.23, p=0.048). ICS was not correlated with these two parameters, but show significant links to GMA (r=0.246, p=0.037) . Gender differences were evident, men more close related to changes in the mentioned physical parameters.

Conclusion: monthly number of AMI and ICS are different related to fluctuations of environmental physical parameters .

The described connections can affect differences in the pathogenesis of these two forms of Acute Coronary Syndrome.

P032 Virtual histology in coronary arteries

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Objectives: The purpose of this observational study is to evaluate the in-vivo plaque composition and characteristics in coronary arteries in patients with stable coronary heart disease and acute coronary syndrome and compare with carotids using Virtual Histology Intravascular Ultrasound (IVUSVH).

Methods and Results: IVUSVH were done in 22 patients with mild to severe stenotic lesions in coronaries and 18 of them also in carotids.8 months clinical and IVUS follow up were done.IVUS VH produces color coded map of the different histological components.IVUSVH derived thin cap fibroatheromas (IDTCFA) were found in 33.3% of cases;66.6% of them were found in symptomatic patients,but in 26.6%- in asymptomatic (p=0.2). Fibrous plaque component were similar in IDTCFA and NON-IDTCFA, necrotic core was 24.17% and 9.81%,p=0.006; dense calcium13.83% and 9.81%,p=0.029 in IDTCFA and NONIDTCFA respectively.In 18 cases we did IVUSVH for both carotid and coronary vessels.There were more dense calcium in conary arteries (10.81% vs. 3.82,p=0.035) and they tend to consist more necrotic core (15.54% vs. 9.4%; p=NS).

Conclusions: IDTCFA are frequently found in symptomatic coronary/carotid patients and quite often in asymptomatic. TCFA detected by IVUSVH in carotids contain more necrotic core and dense calcium than NON-IDTCFA. Coronary arteries in the same patients ar more calcified and tend to be less stable.

P033 Molecular diagnostics of catecholaminergic polymorphic ventricular tachycardia, identification of mutation in the cardiac ryanodine receptor gene

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Catecholaminergic polymorphic ventricular tachycardia (CPVT) is an arrhythmogenic disease characterized by stress- or exercise-induced ventricular arrhythmia, syncope, or early sudden death. No morphological abnormalities have been reported in hearts from CPVT patients.

The cardiac ryanodine receptor (RyR2) gene (chromosome 1q42-q43) has been identified as a gene responsible for CPVT inherited as an autosomal dominant trait, with 50% of offspring from an affected individual being at risk of developing the same disease. The RyR2 gene, which consist of 105 exons, encodes the cardiac Ca^{2+} release channel, which is localized across the sarcoplasmic reticulum (SR) of cardiomyocytes. RyR2 plays a crucial role in the excitation-contraction coupling in cardiac muscles, by its involvement in the storage and release of Ca^{2+} from SR, which subsequently activates cardiomyocyte contraction. There are over 70 human RyR2 mutation discovered so far that are clustered in several discrete regions of the polypeptide, which are important for the modulation of channel function.

We collected CPVT probands and their family members with documented polymorphic ventricular arrhythmias occurring during physical or emotional stress with a normal heart. The aim of this work was establish the genetic characterization on DNA level of the CPVT probands and their family members. Mutation screening of RyR2 gene was performed on genomic DNA samples extracted from peripheral blood lymphocytes. PCR amplified fragments covering areas with known functions or mutations were analysed by sequencing. This methodical approach enabled us to identify CPVT causal RyR2 mutations in clinically affected probands and detect their asymptomatic but genetically affected family members. Genetic analysis achieve early diagnosis, and subsequent preventive strategies such as
β-blocker therapy.

This work was carried through the financial support of The Ministry of Education, Youth and Sports Czech republic (grant MEYS-MŠMT2B08061)

P034 Preventing stent thrombosis by faster endothelialisation with a new biodegradable polymer stent

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Background: Drug-eluting stents have required extension of dual antiplatelet therapy up to 12 months and beyond due to delayed endothelialization. We present the first in man results regarding endothelialization of a drug-eluting stent with biodegradable polymer after 3 months of implantation, evaluated by OCT.

In comparison to the current gold standard, intravascular ultrasound (IVUS), OCT shows basically to major differences: first, its high resolution (10 – 20 µm instead of 100 – 150 µm); and second, that the image generation is based on the optical, rather than the acoustic properties of the tissue (1,2).

In one recent study, OCT showed qualitatively superior delineation of the vessel wall compared to IVUS. In addition, the intimal thickness could be evaluated by OCT and correlated well with the histological examination results (3).

In another study neointimal stent coverage of drug eluting stent and bare metal stents was examined after 2 months (4). Every strut on all successive images was analysed in this study. Neointimal stent coverage was observed in 88% of struts for the drug – eluting stent, and in 95% of struts for the bare metal stent (non-significant).

Methods: We examined 8 Nobori Stents after elective PCI by OCT 3 Months after Implantation (between 3 months and e months, 20 days). All patients were pretreated with Aspirin and Clopidogrel and in addition were treated with Bivalirudin i.v. for the duration of PCI.

After discharge all patients received Aspirin 100 mg daily, Clopidogrel 75 mg daily, Atorvastatin 80 mg daily, Tritace 2,5 mg twice daily, Nevibolol 5 mg daily, as well as Lansoprazol 20 or 40 mg daily.

At T0 + 3 months all patients were readmitted for elective angiography and OCT examination.

Results: OCT images showed complete endothelialization of all 5 stents after 3 months in all planes. There were no exposed stent struts and there was also no area of stent malapposition.

Conclusion: This novel drug-eluting stent with a biodegradable polymer may show far earlier endothelialization than currently used drug-eluting stents. This may considerably shorten the duration of dual antiplatelet therapy and thereby reduce the risk of bleeding significantly. Further studies at our institution are under way.

References

1. Jang IK, Bouma BE, Kang DH, et al. Visualization of coronary atherosclerotic plaques in patients using optical coherence tomography: comparison with intravascular ultrasound. J Am Coll Cardiol 2002; 39: 604-9
2. Yabushita H, Bouma BE, Houser SL, et al. Characterization of human atherosclerosis by optical coherence tomography. Circulation 2002; 106: 1640-5
3. Kume T, Akasaka T, Kawamoto T, et al. Assessment of coronary intima-media thickness by optical coherence tomography: comparison with intravascular ultrasound. Circulation 2005; 69: 903-7
4. Ito T, Terashima M, Takeda Y, et al. Optical coherence tomographic analysis of neointimal stent coverage in sirolimus-eluting stent, compared with bare metal stent. Abstract, TCT 2005

P035 Lessons from Latvian Registry of Acute Coronary Syndromes

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Introduction*:* The management of acute coronary syndromes (ACS) continues to undergo major changes based on evidence derived from well conducted clinical trials and guidelines developed by cardiology societies. Registry of ACS may help to understand if the knowledge coming from clinical trials is being properly applied in different hospitals in our country. The aim of this study was to identify and compare therapeutic and diagnostic approaches of ACS patients in selected hospitals in Latvia.

Methods*:* The Latvian registry of ACS was designed as a retrospective - prospective, national study of patients hospitalized with the diagnosis of ACS. In this registry participated 27 hospitals.Statistical analyses were performed with SPSS software.

Results*:* We analysed 6577 patients with ACS in year 2008. 3807 (57.88%) of patients were in age group between 61-80 years and 55.27% of patients were men. Patient transfer from community hospitals to LCC increased through years and corresponding to 10%, 13%, 15% and 22% of transferred patients in years 2005, 2006, 2007 and 2008, respectively. Hypertension, diabetes mellitus, dislipidaemia, smoking and overweight (BMI>25) were analysed.. Mean hospital stay in patients with STEMI was 8.3 and in patients with NSTEMI - 8.4 days in comparison with 5.6 and 7.2 days at LCC. Troponins were not determined in 3% of patients. 68% and 95% of patients received clopidogrel and 16% and 54% of patients received GPIIb/IIIa blockers in Latvia and LCC, respectively. ACE-inhibitors, beta blockers and statins were used in 83%, 68% and 84% of patients in Latvia and in 88%, 80% and 91% of patients in LCC.

Conclusions*:* High proportion of patients has modifiable risk factors such as hypertension, diabetes mellitus, dislipidaemia, smoking and overweight. Over years use of clopidogrel and GP IIb/IIIa blockers steadily increased but still patients eligible for this therapy do not receive it. Patient transfer from community hospitals to LCC increased reasonably through years.

P036 C-reactive protein in acute coronary syndrome: Corelation with clinical,echocardiographic and angiographic findings

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Background: C-reactive protein level increase in acute coronary syndrome (ACS).Corelation between CRP level and myocardial demage remain to define.We investigate CRP level with clinical,echocardiographic and angiographic findings,and major cardiac events(MACE) in all observated patients.

Methods: 98 patients with ACS included in study.67(68,36%) patients admited and discharged as myocardial infarction with ST elevation /STEMI/.40 patients(59,70%)with non anterior localisation,and 27 patients(40,29%) with anterior localisation.13(13,26%) patients admited and discharged as myocardiail infarction without ST elevation(NSTEMI),18 patients (18,36%)admited and discharged as unstable angina (UA).CRP,SPK,CK-MB and Troponin I concentration,evaluated every12 hours for 48 h,and every 24 h following four days of onset of symptoms.Systolic function estimated by ejection fraction,myocardial lysis by cardiac enzime release and clinical course by Killip classification. Follow up was 6 month.Results:CRP was significantly increase in STEMI, compare to NSTEMI($p<0,05$),and UA ($p<0,01$) .In STEMI there was a corelation between CRP and CPK(0,25,$p=0,05$)and with Troponin I(0,32,$p=0,01$),but low correlation with CK MB.No correlations was found between CRP and ejection fraction.Weak correlation was found between CRP and angiographic findings..CRP level were ,associated with a increase incidence of major adverse cardiac events in STEMI group..No increase incidece of major adverse cardiac events was found in NSTEMI and UA group.

Conclusions: CRP plasmatic concentrations increase in patients with STEMI in comparation in patients with NSTEMI and UA.CRP plasmatic concentrations did not correlate with ejection fraction and angiographic findings.There was correlations with Troponin I in STEMI group.Increase CRP in STEMI group associated with MACE in same group.The increase of CRP levels in STEMI,seems to be linked to the extension of myocardial damage,rather pre-exsisting inflamation.

INDEX

Chairmen, Speakers and Authors

Abraham, Z. 15
Abramson E. 103
Abu Zmiro, I. 12
Abu-Tailakh, M. 2, 16
Agmon, Y. 2, 11
Alcalai, R. 2, 16
Alpert, J.S. 2, 11, 13, 15, 16, 72
Ambarus, V. 99
Amir, O. 2, 14, 56
Amit, G. 2, 13, 38
Aravot, D. 2, 16
Aronson, D. 2, 16
Atar, S. 2, 13, 16, 39, 77
Avisar Caspi, N. 12

Balkin, Y. 2
Banai, S. 2, 11, 13, 15, 45
Bartal, M. 15
Battler, A. 2, 11, 13, 15
Behar, S. 2
Beigel, R. 83
Beltrame, J.F. 47, 51
Ben Gal, T. 2, 15
Ben Harosh, K. 12
Ben Zvi, S. 2, 13
Benbenishty, J. 2, 16, 70
Benhorin, I. 2, 16
Berger, P. 2, 11, 12
Bernotiene G. 103
Birnbaum, Y. 2, 13, 37
Bittnerová, A. 87
Bitzur, R. 2, 12, 15
Bossaert, L. 2, 12, 13, 32
Brezis, M. 2, 15
Brill, S. 2, 13, 43
Bronislav, H. 84
Brosh, S. 83

Cafri, C. 2, 11, 14
Canji, T. 102
Carballo Fernández, D. 89
Cemerlic-Adjic, N. 88, 101, 102
Cercek, B. 2, 16, 74
Chan, Y.P.A. 53
Chen, Y. 86
Chirkov, Y.Y. 53
Chouraqui, P. 83
Ciutea, M. 99
Cohen, M. 2, 12, 28
Cohen, T. 15
Coma Canella, I. 2, 13, 16
Correa, E., 97
Crea, F. 2, 16, 73
Croitoru, M. 11

Dadashev, Z. 2, 15
Danenberg, H.D. 2, 11, 12, 14

Eldar, M. 2, 12
Erglis, A. 104, 108

Faltus, V. 93, 94
Fang, C.C. 86
Fintel, D. 2, 11, 14
Floria, M. 99
Flugelman, M. 2, 13
Freimark, D. 2, 64
Fuchs, S. 2, 13, 46

Gaillyová, R. 87, 105
García Olert, A. 91
García-Wandervalle, R. 90
Geist, M. 2, 12
George, J. 2, 13, 42
Gepstein, L. 2, 13
Gheorghiu, O. 99
Gilutz, H. 2, 13
Glick, S. 2, 15
Glikson, M. 2, 12
Goitein, O. 83
Goldberger, J. 2, 12, 16
Goldman; D. 64
Gottlieb, S. 2, 11, 14
Granot, D. 12
Grave, A. 104
Gregor, D. 106
Grünfeldova, H. 93, 94
Guetta, V. 2, 14

Hadžić-Hadžibegović; R. 85
Halkin, A. 2, 11
Hammerman, H. 2, 11
Hasdai, D. 2, 11, 12, 15, 16
Hasin, Y. 2, 11, 14, 15
Heinz Rupp, H. 2
Henkin, Y. 2, 14

Hernández de Andrés, S. 90
Heuser, R.R. 96
Hidalgo Rey, I.M. 91
Hochman, J. 2, 15, 16, 79
Hod, H. 2, 12, 13, 29, 41, 44
Hod, H. 83
Horowitz, J. 2, 13, 14, 47,
.... 51, 53, 65, 67

Ilia, R. 2, 14
Israelevich, P. 103

Jaffe, A. 2, 13, 14, 16, 57, 71
Jaffe, R. 2, 13, 31
Jansky, P. 93, 94
Jao, Y.T.F.N. 86
Jegere, S. 104, 108
Jovelic, A. 88
Juhnevica, D. 108

Kadlecová, J. 87
Kalter-Leibovici, O. 64
Kaňovský, J. 87
Kapeliovich, M. 2, 12
Kasher, A. 2, 15
Kaufman, G. 2, 15, 64
Kaul, S. 2, 11, 12
Kennedy, J.A. 47
Keren, G. 2, 11, 14
Khalaila, R. 12
Kiyanovsky, V. 11
Klein, J. 2, 13, 48
Konen, E. 83
Kornowski, R. 2, 11, 15
Koster, R. 2, 12, 13, 30
Kovacevic, M. 88, 101, 102
Kovačević; P. 85
Kracoff, O. 2, 13
Kraemer Muñoz, M.C. 90
Kriwisky, M. 2, 13
Kucia, A.M. 2, 15, 65, 67
Kutajeva, I. 104

Lavee, J. 2
Lazarovits, S. 11
León Benítez, F. 89
Leor, J. 2, 13
Lerman, A. 2, 11, 23
Lev, E. 2, 11, 14
Levy Abitbol, R. 90, 91
Levy Aserraf, A. 89, 90, 91
Levy, N. 11, 12
Lewis, B. 2, 12
Liel, N. 2, 14
Londono, O. 92, 97
Lotan, C. 2, 11, 12, 15

Maca, A. 108
Madhusudhannair, V. 98
Maisel, A.S. 2, 14, 15, 54
Malik, J. 100
Marian, I. 99
Markiewicz, W. 2
Matetzky, S. 2, 11, 83
Matic, S. 109
Meisel, S. 2, 14, 55
Mintale, I. 108
Miralles Andújar, J. 91
Mohr, R. 2, 14
Monhart, Z. 93, 94, 95
Monhartova, L. 95
Moriah, R. 15
Moriel, M. 2, 14
Morris, R.G. 47
Mosseri, M. 2, 14, 15
Mundi, A. 98
Murarka, S. 96

Nahir, M. 2, 15
Narbute, I. 104, 108
Neil, C., ... 67
Nguyen, T.H. 67
Northey, D. 65
Novotný, T. 87, 105

Oieru, D. 83
Oller, J. 97

Pacak, J. 100
Pacreu; S. 92
Panic, G. 102
Paredes, L. 92
Pati, P. 47
Petrovic, M. 102
Pollak, A. 2, 11, 13

Pons, C. 97
Popov, T. 88, 101, 102
Porter, A. 2, 14

Qarawani, D. 2, 11
Quinn, T. 2, 11,21, 63

Raanan, O. 2, 11, 16
Rab, A. 106
Radishauskas R. 103
Rajaram, V., 98
Rajendran, S. 53
Rajkovača, Z. 85
Rezus, C. 99
Riečansky, I. 100
Ríos Ortiz, F. 89
Rivkovsky, I. 2, 15, 69
Rosenschein, U. 2, 16
Rotem, A. 2, 13, 52
Roth, A. 2
Rozenman, Y. 2, 12, 13, 14, 15, 50, 59
Rubinshtein, R. 2, 16, 76
Rupp, H. 2, 12, 24

Sagie, A. 2, 11, 14, 19, 60
Sallustio, B.C. 47
Sarbu, O. 99
Schneider Mendlowitz, N. 2, 16, 69
Schultz, A. 12
Segev, A. 2, 11
Shamiss, A. 83
Shani, M. 64
Sharoni, E. 2, 14
Shiran, A. 2,11
Shmein, O. 12
Shotan, A. 2, 14
Shpektor, A. 2, 16, 78
Silber, H. 64
Sondore, D. 104
Srdanovic, I. 88, 101, 102
Steg, G. 2, 11, 14, 15
Steinberg, A. 2, 15
Stelbauma, Z. 104
Stoupel E. 103
Strasberg, B. 2, 12
Strenge, K. 104
Sulkes J. 103
Susak, S. 101, 102
Svandová, E. 105
Sverdlov, A. 47
Swahn, E. 2, 14

Tamoshiunas A. 103
Trusinskis, K. 104, 108
Tubaro, M. 2, 11, 14, 58
Tunuguntla, A. 98
Turgeman, Y. 2
Tzivoni, D. 2, 11

Unger, S. 47

Vahanian, A. 2, 14
Val Carrascón, M.I. 89
Valaskova, I. 105
Varma, J. 98
Vasilieva, E. 2, 11, 22
Vasiljevic, Z. 109
Velicki, L. 101, 102
Vered, Z. 2, 11
Villanueva Serrano, S.J. 89, 90, 91
Viskin, S. 2, 12, 13
Vujin, B. 88

Wang, S.P. 86
Weber, H. 106
Weiss, A.T. 2, 14, 15
Wolak, A. 2, 16, 75
Wolf, C. 106
Wright, D. 65

Yu, C.L. 86

Zabunova, M. 104
Zahger, D. 2, 12
Zaid, G. 2, 15
Zakke, I. 104, 108
Zeitz, C.J. 51
Zivkovic, S. 109