

Summaries of Articles

Clinical Investigations

Comparative Study of Diltiazem, Nitroglycerin, and Sodium Nitroprusside for Controlling Hypertension Following Coronary Artery Bypass Surgery

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Hypertension following coronary artery bypass grafting is a common problem. Various drugs are used for the control of hypertension during this period which is known to be vulnerable for postoperative myocardial infarction and bleeding. The aim of this study was to compare the hemodynamic effects of diltiazem, nitroglycerin, and sodium nitroprusside. For this reason 45 patients were equally allocated into 3 groups. In group 1, diltiazem was administered as a 0.3mg/kg IV-bolus within 5 minutes followed by an infusion of 0.1-0.8mg/kg/hr; in group 2, nitroglycerin as a 1-3µg/kg/min infusion, and in group 3 sodium nitroprusside as a 1-3µg/kg/min infusion. Hemodynamic measurements were done before treatment (T1), and 30 min (T2), 2 hours (T3) and 12 hours (T4) thereafter. Mean arterial pressure decreased significantly within all groups ($p<0.001$). There were no differences between groups at T1 and T2 time points. At T3 time point heart rate was found to be 84 ± 14 , 98 ± 13 , and 94 ± 15 beats/min in the 3 groups, respectively (group 1 vs 2; $p<0.05$). Rate-pressure product was 10975 ± 1476 in group 1, 13071 ± 2476 in group 2, 13788 ± 2965 in group 3 (group 1 vs 3; $p<0.001$). At T4 time point rate pressure product was 10079 ± 1567 in group 1, 12099 ± 2674 in group 2 and 14416 ± 4240 in group 3 (group 1 vs 3; $p<0.001$). The results of this study suggest that the hemodynamic effects of the three drugs are similar within the first 30 minutes. However, after 30 minutes, diltiazem offers a better myocardial performance and more effective control of hypertension compared to nitroglycerin and nitroprusside.

Key word: Hypertension, bypass, intensive care unit

Primary Coronary Stent Implantation for Acute Myocardial Infarction in Diabetic versus Nondiabetic Patients: In-hospital and Clinical Follow-up Results

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Diabetic patients had poorer clinical outcomes during acute myocardial infarction (AMI) compared to nondiabetic patients in the prethrombolysis era. Less is known about the impact of diabetes on early and late clinical outcomes in patients undergoing coronary stent implantation during AMI. This study compares the in-hospital and long term clinical outcomes of AMI patients with and without diabetes. Seven-hundred seventy-four patients who underwent primary coronary stent implantation for AMI in our clinic between 1997 and 2001 were included in the study. We compared the angiographic and clinical outcomes of nondiabetic (aged 55.9 ± 10.6 years; 82.6% male) and diabetic (aged 56.8 ± 11.7 years; 63.1% male) patients treated by primary stenting for acute MI. The in-hospital results and follow-up clinical outcomes of each group were retrospectively analyzed.

Results: The nondiabetic group consisted of 633 (81.8%) patients and the diabetic group of 141 patients. Diabetic patients had a higher incidence of hypertension, hyperlipidemia, and unstable hemodynamic status compared to nondiabetic patients ($p=0.001$, 0.003, 0.001 respectively). Smoking and male gender rates were significantly higher in nondiabetic patients ($p=0.001$, and 0.001, respectively). Angiographic success rates and prominent clinical improvement rates were 96.4% and 90.7% vs 96.7% and 95.1% in diabetic and nondiabetic patients, respectively ($p=NS$, 0.04, respectively). Diabetic patients had a higher incidence of in-hospital deaths and overall events ($p=0.028$). At 1-month follow-up, diabetic patients had required more target vessel revascularization (5.6% vs. 1.6%; $P=0.006$), which

accounted for the majority of the major cardiac events at 1 month (20.6% vs. 7.4%; $P = 0.003$). At a mean follow-up of 7.2 ± 2.7 months, 92.9% of nondiabetic and 88% of diabetic patients were alive ($p = 0.05$). Overall survival from a major cardiac event (death, MI, target vessel revascularization) at 7.2 ± 2.7 month follow-up was 75.8% for nondiabetics and 58.1% for diabetic patients ($P < 0.01$). By multivariate analysis, age, diabetes, shock, hemodynamic instability and female gender were the most important predictors for development of 1-month and late major cardiovascular events.

Conclusion: Primary stenting in the setting of acute MI is effective in restoring immediate TIMI 3 coronary flow both in diabetic and nondiabetic patients. This procedure may prove to be of benefit in reducing mortality in both groups, particularly in diabetic patients, where this benefit is more prominent compared to thrombolytic therapy. Nevertheless, major cardiovascular events at 1 month and intermediate term follow-up are more frequent in diabetic patients.

Key words: Diabetes mellitus, coronary artery disease, myocardial infarction, coronary stent

Reoperations After Arterial Switch for Transposition of the Great Arteries

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Arterial switch operation (ASO) provides anatomic correction for transposition of the great arteries (TGA). Although most patients after an ASO have normal development and cardiac function, a few require reoperation. In this study, among 153 patients who underwent ASO between October 1990 and March 2002, we analyzed 6 patients who needed reoperation after ASO operation. Reoperation was necessary due to pulmonary stenosis (PS) and aortic insufficiency (AI) in 3 patients each. Two patients with AI underwent reoperation in the early postoperative period (1-23 day), while others needed reoperation in the late follow-up period (3-6 years). PS was relieved by using extracardiac conduit in 2 patients with coronary artery anomaly and

supraannular pericardial patch for the other. Neo-aortic valve replacement using mechanical prosthesis was performed in patients with AI. To implant available size mechanical valve, Manouguian aortoplasty was employed in two patients who needed AVR in the early postoperative period. There was no fatality. Left-ventricular assist device was necessary for 48 hours in one of the two patients who underwent AVR in early postoperative period. Long duration of intubation was needed in two patients.

Hence, we think that pulmonary sinus reconstruction with glutaraldehyde-treated autologous pericardium and coronary anomaly may be a risk factor for the development of pulmonary stenosis after ASO. Preoperative pulmonary artery dilatation and two-stage ASO may lead to neo-aortic incompetence. Available size aortic valve replacement with Manouguian aortoplasty is feasible in these patients. Reoperation can be performed with low mortality and morbidity in patients with pulmonary stenosis after ASO.

Key words: Arterial switch operation, reoperation

Transcranial Ultrasonographic Evaluation Microembolism Risk After Cardioversion for Atrial Fibrillation in Anticoagulated Patients

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At least three weeks of oral anticoagulation (OA) is usually recommended for the prevention of thromboembolic events after external cardioversion (EC) in patients with atrial fibrillation (AF). In the past years, along with the use of transesophageal echocardiography (TEE), short-term heparin utilization has been shown to reduce the risk of thromboembolism.

Recently, several studies on the use of transcranial Doppler (TCD) have elucidated absence of microemboli formation after EC in patients undergoing 3 weeks of OA before procedure. At the same time it is not yet known whether there is a risk of microemboli after short-term heparin infusion and EC. We aimed to compare the risks of microemboli

formation after EC using TCD in patients with AF undergoing long-term oral anticoagulation and short-term heparinization before the procedure.

Methods: Forty-three patients scheduled for elective EC due to chronic AF, without signs of intracardiac thrombi on TEE and with sufficient temporal window for transcranial Doppler (among them 21 women, mean age 62 ± 13), were included into the study. While nineteen of the patients received effective OA with INR between 2-3 due to AF (Group 1), 24 patients were heparinized (aPTT=70-80ms) before EC (Group 2). Transcranial Doppler sonography of right and left cerebral arteries, accomplished using two channels 2 MHz probe through temporal bone approach, was performed 30 minutes before and 30 minutes after the EC for the detection of microemboli.

Results: Sinus rhythm was attained in 33 (76%) patients after EC (15 patients in group 1, 18 patients in group 2). No clinical signs testified on thromboembolic event were observed in patients who underwent EC. Microemboli were not recorded by TCD, performed before and after EC, in patients of both groups.

Conclusion: EC is not associated with microembolism in patients anticoagulated using either long-term oral anticoagulation or heparin. Because, short-term treatment with heparin seems to be as effective as long-term OA, EC could be performed early and safely.

Key words: Cardioversion, transcranial Doppler, microemboli

Efficacy and Safety of Single Lead Internal Cardioversion Technique in Patients with Atrial Fibrillation Resistance to External Cardioversion

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Internal cardioversion (ICV) has been suggested as an effective method to restore sinus rhythm in patients with atrial fibrillation (AF). Recently, a new single-lead system with a balloon-tipped

cardioversion catheter was introduced. The aim of this study was to assess the feasibility and efficacy of the balloon-tipped single-lead ICV technique in patients with permanent AF. Eighteen patients (11 were female, mean age 59 ± 14 years) with permanent AF were submitted to single-lead ICV after an unsuccessful external cardioversion attempt. A new balloon-tipped single-lead catheter (ALERT, EP MedSystems, Inc.) with distal and proximal shock electrodes and biphasic shocks ≤ 15 J was used for ICV. The distal shock array was placed in the left pulmonary artery and the proximal one placed into the right atrial tissue under fluoroscopy guidance. All patients were mildly sedated using midazolam. Internal shocks were R-wave synchronized to the single right ventricular (RV) electrode and delivered between distal and proximal array using a new external defibrillation system after the defibrillation impedance was tested. **Results:** In 14 of 18 pts (77%) sinus rhythm was restored with a mean energy of 9.3 ± 5.4 J and mean of 4.2 ± 2.3 shocks delivered. The mean fluoroscopy time was 4.6 ± 2.2 min and mean shock impedance was 61 ± 13 Ω . No complications occurred during the procedure. **Conclusion:** Internal cardioversion using single-lead balloon-tipped catheter is a feasible and effective technique for permanent AF. This technique might increase and expand the clinical use of ICV in patients with permanent AF.

Key words: Atrial fibrillation, single lead catheter technique, internal cardioversion.

Review

How to Treat Patients With Low HDL-cholesterol Levels

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The long-term clinical benefits of reducing elevated levels of low-density lipoprotein cholesterol (LDL-C) have been demonstrated. The reduction in coronary event rate in the statin trials was about 30-35%, so the majority of the patients whose LDL-C was lowered by treatment still had a cardiovascular event. To optimize the efficacy of LDL-lowering therapy different or additional therapeutic targets

need to be considered. An appropriate approach is to increase high-density lipoprotein cholesterol (HDL-C) level in addition to decreasing high levels of LDL-C to reduce the risk of coronary heart disease (CHD).

The association between low HDL-C and increased CHD morbidity and mortality has been demonstrated in many epidemiologic studies. The data of VA-HIT showed for the first time that raising low levels of HDL-C in patients with CHD and normal LDL-C reduces CHD event rate significantly. According to VA-HIT findings for every 1 mg/dl increase in HDL-C there was a 2-3% decrease in CHD death or MI. The data of the study suggest that elevation of low HDL-C may have an equally large impact on cardiovascular events as lowering LDL-C.

Further therapy should be considered for patients who have reached target LDL-C levels and having low HDL-C or patients who have isolated low HDL-C. Life-style changes that include weight reduction, a diet low in carbohydrates moderate in unsaturated fat rather than low-fat, regular exercise, smoking cessation can effectively increase low levels of HDL-C and may reduce the need for drug therapy. Niacin, fibrates, and estrogens are pharmacological agents which increase low HDL levels effectively.

In this review we focused on epidemiological and clinical studies suggesting the importance of HDL-C and overviewed the efficacy of lifestyle changes and available drugs for raising serum HDL-C levels.

Key words: low HDL-C, treatment, lifestyle changes, pharmacological agents