Recent Advances in Cardiovascular Medicine: The Tenth Iranian Congress on Cardiovascular Update

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The 10th National Congress on Cardiovascular Update, organized by the Iranian Society of Atherosclerosis, was held in Tehran, Iran (June 11 – 14, 2008). A variety of issues related to advances in diagnostics and treatment in cardiovascular medicine were covered during the congress. Current problems of atherosclerosis, the role of platelets, and inflammatory biomarkers in its accelerated course were comprehensively discussed. Novel antiplatelet agents were indicated to improve outcomes of secondary cardiovascular prevention. The latest achievements in coronary artery disease, arrhythmias, echocardiography, cardiovascular surgery, congenital heart disease, and stem cell research were also overviewed.

The 10th National Congress on Cardiovascular Update, organized by the Iranian Society of Atherosclerosis, was held in Razi Convention Center in Tehran, Iran (president: M. Ghasemi, copresident: M. H. Mandegar, secretary general: M. R. Mohammad-Hasani). Though it was primarily aimed at advancing knowledge and experience of Iranian invasive and noninvasive cardiologists, updated information on the latest achievements in cardiovascular medicine was of interest for participants representing academic and clinical centers of Tehran and other cities of Iran, other Middle Eastern countries (Iraq, Saudi Arabia, and United Arab Emirates), USA, UK, Switzerland, Russia, and Armenia. The program of the congress was quite extensive and covered a broad spectrum of issues related to atherosclerosis, coronary artery disease, stroke, arrhythmias, echocardiography, cardiovascular surgery, congenital heart disease, stem cell research, coronary and peripheral arterial interventions, and cardiovascular prevention. A number of state-of-the-art lectures and oral communications were delivered by distinguished experts during plenary sessions and satellite meetings. Additionally, there was a medical exhibition where advanced medical technologies, cardiac ultrasound and computed tomography devices, different coronary stents, antiplatelet, lipid lowering, and antihypertensive drugs were advertised. In this report, we will discuss some of the recent achievements in cardiovascular medicine presented during the congress.

Presentations by K. D. Tourbaf (USA) and A. Y. Gasparyan (UK, Armenia) were concerned with an important role of platelet function in atherosclerosis. Much attention was paid to the interaction of activated platelets with erythrocytes and leukocytes, expression of a variety of inflammatory and thrombotic biomarkers on the surface of platelets at different stages of coronary atherosclerosis. Platelet aggregometry with different agonists was referred as an old, but ‘gold standard’ of the assessment of platelet function in coronary artery disease. A number of antiplatelet agents with antiatherosclerotic and antithrombotic properties were presented. Aspirin as the most widely used antiinflammatory and antiplatelet agent was also considered as a relatively safe
means of long-term secondary cardiovascular prevention at a dose of 81 mg daily. Referring to the recently published clinical reviews, it was noted that in clinical conditions associated with chronic inflammation, diabetes, hypertension, and heart failure aspirin therapy may fail to fully inhibit platelet function with subsequent increase of cardiovascular risk. In this regard, definition, detection by laboratory tests, possible causes and treatment options of so called aspirin resistance were discussed in depth. It was stressed out that one of the available options to tackle ‘aspirin resistance’ is to switch to dual antiplatelet therapy (i.e., aspirin plus clopidogrel) or to a potent ADP receptor antagonists such as AZD6140, cangrelor, and prasugrel.

Several presentations were devoted to the prospects of stem cell research in biomedicine and cardiology (H. Hoseinkhani, USA; A. Ghodsizad, USA). The first successive experience of autologous bone marrow-derived stem cell transplantation in ischemic cardiomyopathy was discussed in a presentation from Immunogenetics Laboratory, Department of Immunology, Tehran University of Medical Sciences (M. R. Mohammad-Hasani). This treatment modality was used in eight patients with old myocardial infarction and heart failure with the aim to ameliorate functional capacity of the heart, dampen fibrotic processes, and replace necrotized cardiomyocytes with functioning cells. Enrolled patients were followed up for a year and were found to have a significant improvement in functional class of heart failure, ejection fraction of the left ventricle, and reduction of myocardial infarction size. Results of this pilot study indicate clinical efficiency and safety of transplantation of stem cells with known immune markers in cardiovascular disease. Clinical experience in stem cell therapy gained by Iranian cardiologists is an exemplary and may be of interest for scientists from other research centers in the Middle East and elsewhere in the world.

M. R. Mohammad-Hasani (Iran) presented strategic directions for cardiovascular risk factor prevention and pointed out community-based preventive interventions. Quite interesting was demonstration of figures of cardiovascular morbidity and mortality in the Middle East and ways to avoid preventable causes of cardiovascular mortality. In the Middle East, the highest absolute number of patients with cardiovascular disease is estimated in Iran (15,337,125 patients; population : more than 67 million inhabitants), where combatting major risk factors, including hypertension, smoking, and hyperlipidemia, is crucial for improving health of the nation.

Importance of the problem of metabolic syndrome in the developing and developed world was emphasized in several presentations: ‘Genetic Etiology of Metabolic Syndrome’ (A. Mani, USA), ‘Metabolic Syndrome in the Young’ (S. Nouri, USA), and ‘Prevalence of Metabolic Syndrome in Hospitalized Patients’ (A. A. Kolahi, Iran). Participants of the congress had an opportunity to learn more about definition, prevalence, and prognosis of metabolic syndrome in adolescents and young subjects and get acquainted with an Iranian experience in tackling epidemics of this syndrome. It is suggested that the constellation of cardiovascular risk factors defined as metabolic syndrome may be associated with certain missense mutations in a short arm of chromosome 12p, leading to premature manifestation of coronary artery disease. Due to the lack of universally acceptable definition of the syndrome, its prevalence in developing and developed world is still unknown. Recently, urbanization and westernized lifestyle in the most Middle Eastern countries, including Iran, were distinguished as the main factors of unprecedented urgency of the problem of overweight, obesity, and insulin resistance in Asian nations, supposedly, genetically predisposed to metabolic syndrome. The magnitude of the problem is alarming in the pediatric population of the region. For example, over a period of 1993 – 1999, the number of overweight children aged six to 18 years doubled to 8.3%. Extensive evidence derived from the recently conducted multicenter national survey, entitled Childhood and Adolescence Surveillance and Prevention of Adult Non-communicable Disease (CASPIAN), among a large cohort of 21,111 Iranian school students aged six to 18 years further expanded our knowledge of high prevalence of cardiovascular risk factors among Iranian children, in whom the gap between underweight and overweight is narrowing, thus, putting them at risk of premature cardiovascular disease and diabetes. This landmark study has also outlined key directions for future community-based preventive interventions aimed at increasing physical activity and changing dietary habits in children and adolescents.

Mechanisms of atherogenesis and targets of preventive cardiovascular interventions in children
were analyzed in a talk by H. Darban (Saudi Arabia). Atherogenesis starts markedly early in the life of humans, and its natural course over the period of childhood is a subject of interrelations between traditional risk factors, first of all hyperlipidemia, and inflammatory, immune, and endothelial biomarkers. A significant amount of evidence suggests that excessive production of C reactive protein and other inflammatory biomarkers in chronic inflammatory disorders, such as inflammatory bowel disease, reactive arthritides, may accelerate atherogenesis in children and lead to atherothrombotic events. In some pediatric patients cardiovascular events are caused by coronary artery inflammation and thrombosis due to vasculitis, rather than atherosclerosis. One such example is coronary pathology in patients with Kawasaki disease. An increasing number of reports, observational, and cohort studies distinguish extensive inflammation of intimal and medial layers of coronary arteries with subsequent aneurysm formation as the main source of coronary pathology in these patients, who are at risk of coronary aneurysm rupture. Possibly, the same mechanisms are involved in cardiovascular disease secondary to Adamantiades-Behcet's disease and other vasculitides. Overall, investigations on atherosclerosis and coronary pathology in pediatric population may have further implications for clarifying pathophysiology of myocardial infarction in adults, particularly in cases where coronary atherosclerosis is overlapped or even outweighed by coronary artery destruction and spastic reaction due to systemic vasculitides or other rare causes of cardiovascular disease.

Better understanding of pathways of inflammation, immune response, and endothelial dysfunction in coronary atherosclerosis may provide important clues for coronary angioplasty and stenting with different types of bare-metal and drug-eluting stents. The advantages and disadvantages of bare-metal, sirolimus/paclitaxel eluting, and titanium oxide-coated stents were highlighted in presentations by M. Honarvar (Iran; 'Coronary stent fracture and restenosis'), M. Mehrpouya (Iran; 'Improvement in the left ventricular ejection fraction and wall motion abnormality after successful angioplasty and stenting in patients with chronic coronary occlusion'), and R. Corti (Switzerland; 'Update on drug-eluting stents'). There are still uncertainties over the use of coronary stents in different cohorts of patients. Numerous factors should be carefully weighed to make a decision over the deployment of a particular stent: number of affected coronary arteries, size and character of an affected area, functional state of the myocardium, comorbidities such as diabetes and hematological disorders, risk of major bleedings posed by long-term (six to 12 months) dual antiplatelet therapy, history of previous coronary interventions with stenting. Of note, a recent analysis of angiographic and clinical data of the SIRTAX trial (Sirolimus-Eluting Stent Compared with Paclitaxel-Eluting Stent for Coronary Revascularization) demonstrated superiority of sirolimus-eluting stents over paclitaxel-eluting stents in reducing adverse cardiovascular events over a period of up to two years after percutaneous coronary intervention in small-vessel disease (size of the treated coronary vessels less than 2.75 mm). However, there was no difference in the efficiency of these stents in large-vessel disease.

To date, the issues of neointimal intrastent hyperplasia, early, late, and very late restenosis of the stented coronary arteries deserve serious consideration. Current international guidelines provide solutions for only some problems associated with the use of drug-eluting stents. One of the most important unresolved issues, very late restenosis and thrombosis, necessitate prolonged use of clopidogrel and aspirin therapy (six to 12 months or even longer). However, this approach increases the risk of major bleedings and expenses related to antiplatelet therapy. From this standpoint, bare-metal stenting seems more appropriate, though a high rate of target vessel revascularization and some other drawbacks of these stents complicate the issue. Furthermore, prospects of improvement of stenting with the stainless-steel stents coated with titanium-nitride-oxide and bio-absorbable everolimus-eluting stents (M. Hashemian, Iran), highlighted during the congress, raise another question as to whether there is an ultimate solution to the problem of coronary stenting.

Elegant reviews on minimally invasive cardiovascular surgery were provided by H. Hassoun (USA, UAE), M. Ghasemi (Iran), and M. H. Mangedar (Iran), who demonstrated advantages of novel endovascular devices in acute and chronic carotid and aortic pathology. Nowadays, percutaneous abdominal aortic aneurysm repair, transthoracic endovascular aortic repair, or minimally invasive valvular surgery are seen as highly effective alternative approaches to
traditional surgical interventions with large incisions, an increased risk of bleedings, hematomas, and associated high cardiovascular morbidity and mortality.

Last, but not least important, multislice computed tomography coronary angiography as a noninvasive method of visualization of coronary arteries in patients with coronary artery disease and valvular pathology was a subject of several presentations of Iranian scientists (R. Shafian, M. Ghasemi, L. Miralizadefard, N. Shirvandehi). It was noted that noninvasive assessments of coronary arteries may assist cardiologists in clarifying source of chest pain, evaluating coronary stents and coronary artery bypass grafts, and visualizing pattern of blood flow at sites non-visible by traditional angiography. Notably, computed tomography coronary angiography appears to hold diagnostic accuracy in detecting coronary artery lesions and, at the same time, to avoid the risk associated with the use of conventional invasive method of coronary angiography.

References