Correlates of Delayed Recognition and Treatment of Acute Type A Aortic Dissection: The International Registry of Acute Aortic Dissection (IRAD)

An acute aortic dissection is a surgical emergency with a high mortality if left untreated. Given the varied presentations, including similarity to the far more common acute coronary syndromes, diagnosis and appropriate treatment are often delayed. This report evaluates the reasons for delay in the diagnosis of 894 patients in the International Registry of Acute Aortic Dissection Registry. Patients with the most typical presenting signs and symptoms, including abrupt onset of severe chest pain, and those with pulse deficits or hypotension, were diagnosed more quickly. In contrast, patients transferred from referral hospitals had significantly longer times to diagnosis and ultimately to surgery, perhaps related to the physician’s experience with dissection at these hospitals. Delays from diagnosis to surgery also occurred in nonwhites, those with prior cardiac surgery, and those without ongoing shock or hypotension. Education directed at recognition of both typical and atypical presentations of aortic dissection, particularly to those centers with low exposure to aortic emergencies, may be of benefit. The fact that the median times from presentation to diagnosis and from diagnosis to surgery exceeded 4 hours suggests that there is substantial room for improvement. The development of systematic care pathways for diagnosis and management of aortic dissection, similar to those in place for acute myocardial infarction, may be of benefit. The focus of these pathways should include recognition of both typical and atypical presentations, with rapid diagnostic imaging in appropriate candidates and prompt transfer and surgery. See p 1911.

Isolated Atrioventricular Block in the Fetus: A Retrospective, Multinational, Multicenter Study of 175 Patients

Isolated congenital complete atrioventricular block in the fetus is a rare but potentially lethal condition, most frequently associated with transplacental passage of maternal anti-Ro/SSA autoantibodies. With the assumption that this triggers an inflammatory reaction and subsequent fibrosis in the atrioventricular node, transplacental steroid treatment has been used with the aim to mitigate cardiac damage, but the effect of steroid treatment on outcome is still unclear. In this retrospective multicenter study of 175 fetuses with second- or third-degree atrioventricular block, 38% were treated with fluorinated steroids. Ninety-one percent were alive at birth, and survival in the neonatal period was 93%, without any difference between steroid-treated and untreated patients. A gestational age <20 weeks, a ventricular rate ≤50 bpm, the presence of fetal hydrops, and impaired left ventricular function at diagnosis were associated with an increased risk of death. The presence of ≥1 of these risk factors was associated with a 10-fold increase in mortality before birth and a 6-fold increase in the neonatal period independently of treatment. Except for a slightly lower gestational age at diagnosis in treated than untreated patients, risk factors were equally distributed between groups. Reversion of incomplete atrioventricular block was seen in 5 steroid-treated patients, but only 2 of them remained in sinus rhythm at 1 and 2.7 years of age. Our results do not support universal treatment with steroids for antibody-exposed fetuses with complete atrioventricular block, but because of the retrospective design, we cannot rule out a possibly beneficial, or even harmful, effect of steroids. See p 1919.

Maternal and Fetal Factors Associated With Mortality and Morbidity in a Multi–Racial/Ethnic Registry of Anti-SSA/Ro–Associated Cardiac Neonatal Lupus

The cardiac manifestations of neonatal lupus include advanced conduction disease and rarely an isolated cardiomyopathy. This study, which included 325 offspring exposed to maternal anti-SSA/Ro antibodies with cardiac neonatal lupus, was used to determine the mortality, morbidity, and associated risk factors in a multi–racial/ethnic US-based registry. The case fatality rate was 17.5%. A third of the cases died in utero. The cumulative probability of survival at 10 years for a child born alive was 86% (most dying within a year of birth). Fetal echocardiographic risk factors associated with a statistically significant increase in mortality in a multivariate analysis included hydrops, endocardial fibroelastosis, an earlier diagnosis of cardiac neonatal lupus, and a lower ventricular rate. Overall, isolated advanced heart block was associated with a 7.8% case fatality rate, whereas the concomitant presence of dilated cardiomyopathy or endocardial fibroelastosis more than quadrupled the case fatality rate. There was a significantly higher case fatality rate in minorities compared with whites, who were at a lower risk of hydrops and endocardial fibroelastosis. Pacing was required in 70% by 10 years, and 4 children underwent cardiac transplantation. Data from this cohort reveal that nearly one fifth of fetuses who develop cardiac neonatal lupus die of complications predicted by echocardiographic abnormalities consistent with antibody-associated disease beyond the atrioventricular node. See p 1927.

Transcoronary Concentration Gradients of Circulating MicroRNAs

MicroRNAs (miRNAs) are short, noncoding RNAs that control gene expression on a posttranslational level. Recent studies show that miRNA can be detected in circulating blood, and selected miRNAs have been shown to be elevated in the blood after acute myocardial infarction. Here, we demonstrate that muscle-enriched miR-499 and miR-133a are released from the heart into the coronary circulation on myocardial injury and that this release closely correlates with the extent of myocardial injury. In contrast, the endothelial cell–enriched miR-126 is consumed during transcoronary passage in patients with evidence of myocardial injury. These data suggest a differential regulation of muscle versus vascular miRNAs across the coronary circulation. Because muscle-related miRNAs closely correlate with the extent of myocardial injury, future studies should evaluate their usefulness as biomarkers for cardiac injury. See p 1936.

Effects of a Novel Aldosterone Synthase Inhibitor for Treatment of Primary Hypertension: Results of a Randomized, Double-Blind, Placebo- and Active-Controlled Phase 2 Trial

A growing body of literature links aldosterone to the development and/or progression of a variety of cardiovascular disease processes, including endothelial dysfunction, hypertension, ventricular remodeling, and congestive heart failure. Blockade of the mineralocorticoid receptor with antagonists such as spironolactone has shown benefit in blunting or reversing many of the unfavorable effects attributed to aldosterone. An alternative approach to blocking the effects of aldosterone is to prevent its production by inhibiting aldosterone
valve replacement because of prohibitive operative risk. In a cohort of many patients with severe aortic stenosis do not undergo surgical valve replacement due to the prohibitive operative risk. The deadly nature of the disease, with death documented for 62 patients (operable and nonoperable) received off-label pulmonary endarterectomy with a mortality rate of 4.7%. Although clinical symptoms, New York Heart Association class, and hemodynamics were not different between operable and nonoperable patients, nonoperable patients were older, had a lower 6-minute walk test, had smaller pulmonary emboli in the past, were less likely to receive thrombolytic therapy with their prior pulmonary embolus, and were more likely to have other causes of pulmonary hypertension. The large difference in rates of pulmonary endarterectomy between countries suggests other local factors influenced the decision to operate on patients with chronic thromboembolic pulmonary hypertension. The indication for pulmonary endarterectomy is not clearly defined, and is dependent on the experience of the surgical team. About one third of patients (operative and nonoperative) received off-label pulmonary hypertension–targeted treatments. Finally, these data emphasize the deadly nature of the disease, with death documented for 62 patients out of 679 during the observation period of the study (≥10 months). See p 1973.

Association of Physical Activity With Vascular Endothelial Function and Intima-Media Thickness: A Longitudinal Study in Adolescents

The development and progression of subclinical atherosclerosis in adolescence are associated with functional and structural changes of the arteries, including impairment of the arterial vasodilatory function and thickening of the arterial wall. Flow-mediated dilatation of the brachial artery, assessed noninvasively by ultrasound, is a widely used marker of systemic arterial endothelial function. Although the carotid artery has commonly been the target for ultrasonic assessment of early structural changes, the earliest morphological alterations emerge in the abdominal aorta. Intima-media thickness of the abdominal aorta may therefore be a better surrogate marker of atherosclerosis than carotid intima-media thickness especially at young age. Physical activity has a beneficial effect on vascular function and structure by enhancing endothelial function and decreasing the progression of carotid intima-media thickness. To date, data on the effect of physical activity on vascular function and structure in adolescents are scarce and longitudinal studies are lacking. Our study shows the favorable effect of leisure-time physical activity on flow-mediated dilatation and intima-media thickness in nearly 500 adolescents studied repeatedly at 13, 15, and 17 years of age. Importantly, even a moderate increase in physical activity among those who were sedentary was related to a decreased progression of intima-media thickness. These results emphasize the potential of promoting physical activity, especially in inactive adolescents, to support cardiovascular health. Clinicians should encourage physical activity among adolescents, and enjoyable ways to increase physical activity should be paid attention to, especially for those who are sedentary. See p 1956.

Health-Related Quality of Life After Transcatheter Aortic Valve Replacement in Inoperable Patients With Severe Aortic Stenosis

Many patients with severe aortic stenosis do not undergo surgical valve replacement because of prohibitive operative risk. In a cohort of such patients, the Placement of Aortic Transcatheter Valves (PARTNER) trial recently showed that transcatheter aortic valve replacement increased 12-month survival by an absolute margin of 20% but was associated with increased risks of vascular complications and stroke compared with standard therapy, which included balloon aortic valvuloplasty in the majority of subjects. In this trial, quality of life was assessed prospectively with the Kansas City Cardiomyopathy Questionnaire and the Short Form-12 General Health Survey. We found that the overall summary score of the Kansas City Cardiomyopathy Questionnaire, the primary quality-of-life end point, improved 20 to 30 points on a 100-point scale at 1, 6, and 12 months after transcatheter aortic valve replacement, whereas the improvement in the control group was 10 to 12 points at 1 and 6 months and only 4 points at 12 months. Similar patterns were observed for the other quality-of-life measures. Thus, during the first year after intervention, quality of life was substantially better in the transcatheter aortic valve replacement group than in the control group in this clinical trial population. See p 1964.

Chronic Thromboembolic Pulmonary Hypertension (CTEPH): Results From an International Prospective Registry

We present short-term data from a large, prospective, international (mostly European) noninterventional registry of newly diagnosed patients with chronic thromboembolic pulmonary hypertension, including operable and nonoperable cases. In this registry, the diagnosis of chronic thromboembolic pulmonary hypertension was often delayed, with a median of 14 months after the initial symptoms. Three quarters of patients had a history of prior acute pulmonary embolism. One third of patients received pulmonary endarterectomy with a mortality rate of 4.7%. Although clinical symptoms, New York Heart Association class, and hemodynamics were not different between operable and nonoperable patients, nonoperable patients were older, had a lower 6-minute walk test, had smaller pulmonary emboli in the past, were less likely to receive thrombolytic therapy with their prior pulmonary embolus, and were more likely to have other causes of pulmonary hypertension. The large difference in rates of pulmonary endarterectomy between countries suggests other local factors influenced the decision to operate on patients with chronic thromboembolic pulmonary hypertension. The indication for pulmonary endarterectomy is not clearly defined, and is dependent on the experience of the surgical team. About one third of patients (operative and nonoperative) received off-label pulmonary hypertension–targeted treatments. Finally, these data emphasize the deadly nature of the disease, with death documented for 62 patients out of 679 during the observation period of the study (≥10 months). See p 1973.