Heartbeat: Highlights from this issue

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Clinical cardiovascular research primarily is conducted in high-income countries where highly sophisticated medical care is widely available. We have little data on disease patterns and outcomes in low and middle-income countries (LMIC) where medical resources often are limited. In the Editor's choice in this issue of *Heart*, Professor Sliwa and colleagues (*see page 1967*) present a prospective cohort study of 225 pregnant women with cardiovascular disease seen at a single center in South Africa. In high risk women, 32% had congenital heart disease, 26% valvular disease and 27% had a cardiomyopathy. In contrast to higher-income countries where congenital heart disease is the primary concern, in this cohort rheumatic valve disease, hypertensive heart disease and cardiomyopathy were more common; often complicated by comorbid HIV/AIDS. In the 152 women who had cardiovascular symptoms, 6% died within 6 months, with most deaths occurring more than 6 weeks post-partum. The perinatal infant mortality rate was 7 per 1000 live births.

In an editorial, Professors Ribeiro and Freire (*see page 1901*) comment that further studies on the clinical disease spectrum and outcomes of cardiovascular disease in LMICs are needed. However, they caution that "although LMICs have been frequently treated as a group, they have very distinct economic, cultural and geographical situations, and the risk of oversimplification and generalisation of the findings should be avoided." Ribeiro and Freire also point out that despite a high risk group of women with a disease profile different from high-income countries, Sliwa and colleagues were able to achieve good outcomes with a feasible and low cost clinical protocol. This report of how to organize a cardiac disease and maternity clinic in a low resource setting should be valuable to others facing similar clinical challenges.

The pulmonic autograft, or Ross operation, for treatment of aortic valve disease in children remains controversial. Professor Luciani and colleagues (*see page 1954*) provide further data relevant to this controversy with 23 years of experience

Figure 1 Referral algorithm to joint Cardiac Maternity Clinic, Groote Schuur Hospital. BMI, body mass index; BP, blood pressure; ESC, European Society of Cardiology; ASD, atrial septal defect; VSD, ventricular septal defect; NYHA FC, New York Heart Association Functional Class; PPCM, peripartum cardiomyopathy; RHD, rheumatic heart disease; HT, hormone therapy; AV, aortic valve.

from 11 centers in 305 children who underwent the Ross operation between 1990 and 2012. Overall operative mortality was 3.3% with a 15-year survival of $89 \pm 3\%$. However, overall freedom for any reoperation was only $67 \pm 6\%$ at 15 years, with 34 children requiring autograft re-operation, most often with valve replacement, and 25 requiring replacement of the pulmonic conduit.

Professors Yacoub and El-Hamamsy (*see page 1905*) put these findings into

perspective, reminding us of the advantages of the Ross procedure, which include growth of the autograft with the child, and avoidance of anticoagulation, both of which are especially important in children. They also note that both mortality rates and risk of aortic reoperation were highest in infants, with a mortality of only 0.2% and aortic reoperation rate of only 10.5% in older children in the Italian experience. They conclude: "It is hoped that lessons learned from large

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Figure 2 Examples of discrepancies between echocardiographic and cardiac magnetic resonance (CMR) quantification of aortic regurgitation (AR). Example 1: transthoracic echocardiography showing jet arc length in the short-axis view that covers <30% of circumference (A) consistent with severe AR, whereas CMR shows a regurgitant fraction (RF) of 14% (B), which is consistent with mild AR by CMR. Example 2: transthoracic echocardiography showing jet arc length in the short-axis view that covers 10%–20% of circumference (C) consistent with moderate AR, while CMR showed a RF of 36%, which is consistent with severe AR.

registries with long careful follow-up like that of the Italian multicentre registry will help in optimising the results of the Ross

operation at all ages, and address the major concerns regarding the current under use of this operation.”

Figure 3 Kaplan-Meier survival by grade of aortic regurgitation (AR) in transfemoral balloon expandable valve cases.

This issue of Heart also includes 3 articles on paravalvular aortic regurgitation (AR) after transcatheter aortic valve implantation (TAVI). Compared to cardiac magnetic resonance imaging (CMR), echocardiography significantly underestimated the severity of post-TAVI paravalvular AR with moderate AR in 25% by CMR versus 8% by echocardiography in one study (*see page 1933*). Similarly, another study found that while there was a good correlation between CMR and echocardiographic measures of native valve AR pre-TAVI, echocardiographic measures of paravalvular AR post-TAVI showed a poor correlation with CMR (*see page 1924*). In an editorial commenting on both of these papers, Dr Grayburn and colleagues suggest: “While colour Doppler imaging of AR is excellent for ruling out paravalvular leak (PVL), CMR should be used when PVL is present and of uncertain severity. When a single small round PVL is present posteriorly by colour Doppler, PVL is likely mild and CMR not needed. When multiple jets are present or the orifice is not round, colour Doppler will likely underestimate PVL and CMR should be considered.” (*see page 1903*).

In a series of 2584 TAVI procedures, predictors of moderate-to-severe paravalvular AR were a large aortic annulus, a high baseline transaortic gradient and a self-expanding prosthetic valve (*see page 1939*). In addition, the presence of moderate-to-severe paravalvular regurgitation with a self-expandable TAVI was associated with a higher one-year mortality, compared to those with no or mild AR. Hopefully, improvements in valve design will reduce the rate and severity of paravalvular AR after TAVI in the future.

In the Education in Heart article for this issue by Dr. Brugada and colleagues (*see page 1975*) summarize the utility of CMR for guiding electrophysiology procedures. The ability to combine anatomic imaging of the left atrium with electrical voltage maps is nicely illustrated along with how this data is used guide the procedure.

The Image Challenge case (*see page 1932*) tests your skills in identifying the mechanism of a wide complex tachycardia, an ECG pattern which we all see frequently in clinical practice!

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