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EDITORIAL

Echoing Concerns: Tackling Rheumatic Heart Disease in Pregnant First Nations Women

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Rheumatic heart disease (RHD), a sequel of group A streptococcal infection, is a leading cause of valvular heart disease worldwide. Australian First Nations people have some of the highest rates of RHD in the world, with a 2:1 female preponderance and a peak prevalence during the ages of 25–34 years—clearly overlapping with childbearing years [1]. One study from Australia's neighbouring country Timor-Leste previously demonstrated that one-third of women requiring cardiac intervention for RHD were pregnant or breastfeeding at time of presentation with severe RHD [2].

In addition to epidemiological overlap in populations affected, the diagnosis of RHD is often made in pregnancy, due to increased physiological demands unmasking previously occult valvular heart disease as well as increased engagement with healthcare services during the antepartum. It is important to know if RHD is present during pregnancy, as it has significant implications for a pregnant woman's care. Echocardiography is the primary modality for diagnosis of RHD, and is approximately 10 times more sensitive than auscultation alone, being able to detect milder cases of RHD [3]. Discovery of RHD then mandates secondary treatment with penicillin to prevent recurrence of acute rheumatic fever (ARF) and attenuate progression of established disease.

In this edition of *Heart, Lung and Circulation,* Marangou et al. performed a 4-year retrospective analysis of clinically-indicated echocardiograms performed in pregnant women by the major echocardiography provider in the Northern Territory (NT) of Australia [4]. The provider is affiliated with a large private hospital which delivers approximately one-tenth of babies in the NT (497 deliveries in 2017, 340 in 2020 [5]), and provides outreach echocardiography services to rural and remote areas. As such, the reach of this article is impressive, with wide capture of an at-risk population. Of note, of the 322 women assessed in this study, 195 (60.6%) were First Nations Australians.

This study found that most echocardiograms were performed with advance knowledge of existing pathology, predominantly RHD or congenital heart disease (CHD). This limits any assessment of detection rates on echocardiography in pregnancy, even in an RHD-endemic setting. As anticipated, RHD was substantially over-represented in First Nations Australians compared to non-First Nations Australians (39.5% vs 0.8%). Approximately one in 20 echocardiograms performed, or one in 10 without previously diagnosed heart disease, identified new diagnoses of RHD, but all were of mild severity, with echocardiograms mainly ordered due to the clinical finding of a murmur, or for screening purposes, rather than symptoms. Of those First Nations women in

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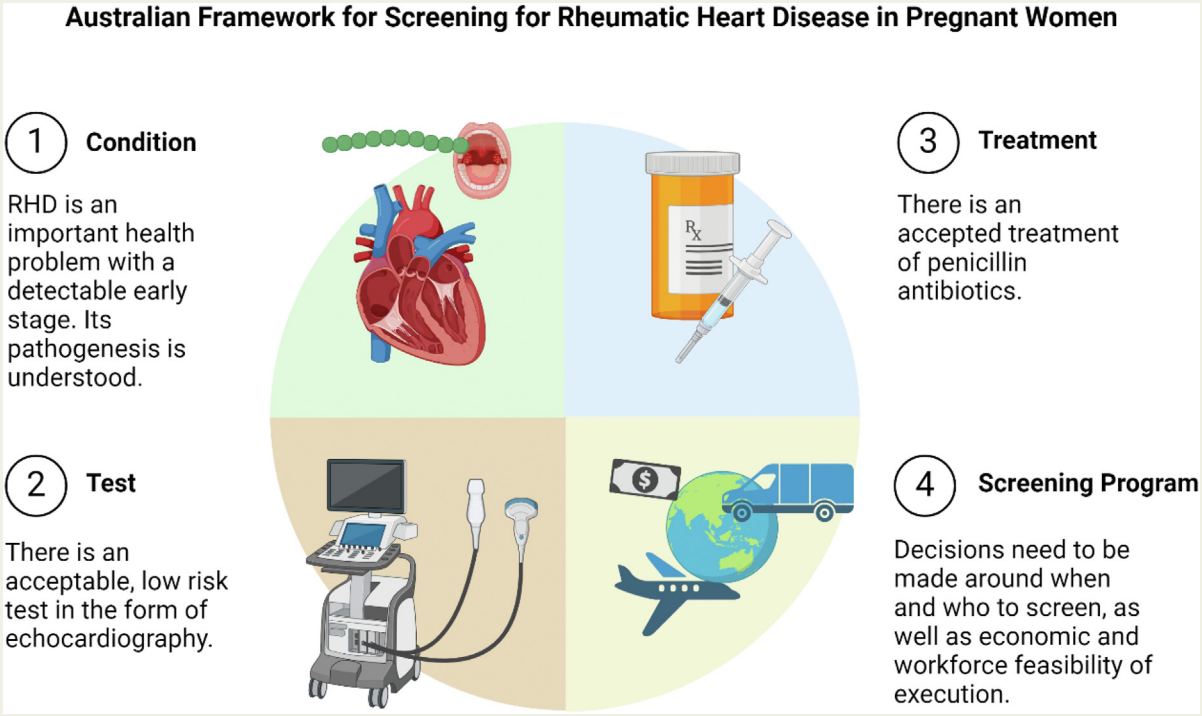

Figure Rheumatic Heart Disease (RHD) within the Australian Population Based Screening Framework (created with BioRender.com).

whom RHD was identified, 12/58 (20.7%) required interstate hospital transfer for support for delivery. Amongst this population, all had a pre-existing diagnosis of RHD.

There are important limitations to this study, acknowledged by the authors. The use of a single echocardiogram only for each woman is understandable, given the pragmatic retrospective nature of the study; however, it would be of high clinical interest to follow the haemodynamic impact of RHD throughout the pregnancy trimesters. The other major limitation is the lack of relevant pregnancy information—for example, whether cardiac interventions took place after interhospital transfer, mode of delivery, and outcomes for the women and their babies.

Despite these limitations, this study is one of only a few globally to address the important issue of RHD in pregnancy in a real-world context and opens important avenues of conversation and directions for future research.

The protocol described by the authors in this article could be simply scaled up nationally (albeit the proportion of First Nations representation would then drop substantially). National echocardiographic resources linked with extensive comorbidity data would provide scope for identification of echocardiograms, pregnancy status, extensive comorbidity data, and maternal and foetal outcomes. The authors also mention plans for a future cross-sectional study, which will be important for further informing our understanding of the prevalence of RHD in pregnancy in Northern Australia in a more equitable manner [4]. More important than this, however, is the authors' implicit call to action for prospective monitoring and screening of RHD, particularly in high-prevalence areas such as the NT.

Given this study's identification of an approximately 40% rate of RHD and/or history of ARF amongst First Nations women, should screening for RHD in pregnant First Nations Australians be a next logical step? Echocardiographic screening is becoming more feasible, given the increasing availability of low-cost, hand-held and portable echocardiography [6]. However, it is challenging to draw such a hypothesis from this article, given the heavy selection bias—all patients in this study were referred for echocardiography on clinical grounds or with a known diagnosis of RHD. Overall, it appeared that the high prevalence of RHD noted within First Nations Australians in this study was very much a function of known disease in those already engaged with medical care, with routine monitoring echocardiography being performed as part of standard antenatal practice, and with echocardiograms performed not substantially altering the trajectory of the women's care.

Despite this, echocardiographic RHD screening in high-risk populations such as First Nations Australians may be able to meet the requirements of the Australian Government Department of Health's population-based screening framework (Figure)—it has a subclinical but detectable latent stage, a low-risk, acceptable screening test, and an effective treatment [6]. Screening should be able to identify more RHD cases, earlier in their clinical course. A recent global systematic review of 23,166 screened pregnant women in areas of endemic RHD found that a new diagnosis of RHD was

made in a potentially clinically significant 0.4%–6.6% of the gravid population, albeit with a low quality of evidence and uncertainty regarding impact on obstetric outcomes [7].

The fourth and last component of the screening framework consists of the establishment of a sustainable screening program, both in terms of fiscal and workforce capability. A careful economic analysis would be required to assess the feasibility of this in the Australian national healthcare program. In the NT, with its scarce specialty resources and great geographic expanse, the capacity to expand echocardiographic services to identify all at-risk pregnant women and cope with appropriate further investigation and counselling of all screen-positive women would also demand careful consideration.

It is also critical to note the mantra of obstetrics—that the best time to diagnose any health problem is before pregnancy. In cardiac terms, pregnancy is a stress test that cannot easily be quit mid-way, and the dynamic stress of supporting two serial circulations is a frequent precipitant for unmasking RHD or causing decompensation of (particularly stenotic) valvular lesions [2]. The peak incidence of ARF with associated carditis is between 5–14 years old in Australia [8], and as such a focus on primordial, primary and secondary prevention in younger age groups with future-forward pregnancy planning is probably the ideal mode of healthcare delivery [9]. Diagnosis of decompensated RHD in the second trimester should be regarded as an adverse event rather than an ideal time to have conducted screening. Community initiatives such as the Deadly Heart Trek (established by one of the authors of this study) [10] already impressively deliver in-community RHD diagnosis, discussion and care in younger at-risk generations in a more cohesive model that will hopefully preclude late in-pregnancy diagnoses of RHD.

Ultimately, Marangou et al.'s article highlights many important issues in the modern multidisciplinary Australian healthcare system. We echo key concerns raised by the authors and share their encouragement for future prospective investigations in the intersecting challenges of RHD and pregnancy.

Disclosure

The authors report no conflicts of interest.

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