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Title: PERINATAL OUTCOMES FOR AUSTRALIAN WOMEN WITH ARF/RHD: A MULTI-JURISDICTIONAL POPULATION-BASED DATA LINKAGE STUDY

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Background & Aims: The burden of acute rheumatic fever (ARF) and rheumatic heart disease (RHD) is concentrated in young Indigenous women of child-bearing age because of inequity in social determinants of health, despite well-recognised pathways to prevention. Underlying haemodynamic changes in pregnancy may complicate existing RHD status. This can potentially increase the risk of negative perinatal outcomes. However, the current literature inadequately describes perinatal outcomes for Australian women with ARF/RHD. This study aimed to investigate detailed perinatal outcomes for Australian women with ARF and RHD using linked data.

Methods: This retrospective cohort study used previously assembled End RHD in Australia: Study of Epidemiology (ERASE) administrative data collection linked to jurisdictional perinatal birth data collections to identify women with ARF/RHD from four Australian jurisdictions, from 2002-2017. Perinatal outcomes of 650 unique pregnancies from 411 women during this period, were stratified by maternal ARF/RHD status at birth relative to the status at 20 weeks' gestation (ARF-only; uncomplicated RHD; uncomplicated to complicated RHD; complicated RHD). RHD complications were defined as cases of RHD, requiring surgical intervention, or as having developed RHD related complications. Multiple univariate and multivariate logistic regression models were constructed to determine pregnancy level associations between ARF/RHD status, demographic, antenatal and birth related factors and composite adverse perinatal outcomes (fatal and non-fatal) and specific outcomes including intrauterine growth restriction (IUGR) and preterm birth. The findings were expressed as odds ratio (OR) with their 95% confidence intervals (CI).

Results: Our study comprised of birth records of mothers with a median age of 24 years (interquartile range (IQR): 20 - 28 years), predominantly Indigenous (89%), belonging to the Northern Territory (71%), living in remote or very remote areas (74%) and socioeconomically disadvantaged (89.9%). Among identified maternal co-morbidities, anaemia (25%), diabetes (16%) and hypertension (14%) were common. Additionally, slightly more than half of the women smoked during pregnancy (52%; 219/423). Furthermore, about 34% of births were delivered via caesarean section. Three of five births (377/644, 59%) resulted in one or more adverse perinatal outcomes. Perinatal mortality was less common in our cohort (3%). Among non-fatal outcomes, respiratory distress (212/649, 33%), preterm birth (180/630, 29%) and IUGR (118/650, 18%) were most common. The crude odds of any adverse perinatal event in pregnancies where maternal RHD progressed from uncomplicated to complicated was 2.23 times higher than ARF-only pregnancies (OR 2.30, 95% CI 1.25 - 4.62). This effect remained significant after adjustment for demographic, antenatal and birth related factors (adjusted odds ratio: 2.16, 95% CI 1.12 - 4.46). Furthermore, similar but less stark odds of an adverse perinatal event were observed for uncomplicated RHD (adjusted OR: 1.37, 95% CI 0.84 - 2.26) and pre-existing complicated RHD (adjusted OR: 1.54, 95% CI 0.94 - 2.51) relative to ARF-only pregnancies. Similarly, the crude odds of preterm birth were higher in the uncomplicated to complicated RHD pregnancies compared to ARF-only pregnancies (OR 2.42, 95% CI 1.21 - 4.90). However, no such difference was observed for IUGR.

Conclusions: This study is the first to provide population level evidence of adverse perinatal outcomes among births to Australian mothers with different ARF/RHD complication status. We found higher odds of adverse perinatal outcomes among mothers developing RHD complications during the episode of pregnancy. Our findings reiterate the importance of provision of adequate supportive antenatal care and improved antenatal diagnosis for RHD women thereby reducing RHD complications and subsequent adverse perinatal outcomes. Our study builds on limited Australian evidence, to allow clinicians and expectant mothers to make informed decisions regarding antenatal care.