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Commentary

The ongoing effect of diabetes during pregnancy and the impact on infants

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In this issue of *The Lancet Regional Health-Western Pacific*, Hare and colleagues have reported on over three decades of data on hyperglycaemia (defined as pre-existing and gestational diabetes) during pregnancy and birthweight trends in a cohort of Aboriginal and non-Aboriginal women from the Northern Territory, Australia. [1] The authors report on the increase in rates over time in gestational diabetes (3.4% in 1987 to 13% in 2016) and pre-existing diabetes (0.6% in 1987 to 5.7% in 2016) in pregnant Aboriginal women. A similar increasing trend for gestational diabetes was also reported for non-Aboriginal women (1.9% in 1987 to 11% in 2016), with no change in pre-existing diabetes ($\leq 0.7\%$ throughout). Along with the increase in hyperglycaemia over time there was also a decrease in small-for-gestational-age for both Aboriginal and non-Aboriginal mothers. Despite this important decrease, there was a significant concurrent increase over time for large-for-gestational-age and high birthweight ($>4000\text{g}$) infants for both Aboriginal and non-Aboriginal mothers with the average increase for Aboriginal mothers greater than non-Aboriginal mothers. Importantly when investigating the contribution of hyperglycaemia during pregnancy on large for gestational age infants, the authors found that there was a strong association over time.

High quality antenatal care plays an important role in the health and wellbeing of mothers and their infants. We agree with the authors that improved rates in small-for-gestational age infants is likely the result of improved timing of early first antenatal visits and a reduction in teenage mothers. Current clinical practice guidelines advise on several discussion points for women with diabetes during pregnancy. [2] These include but are not limited to the role of diet, physical activity and weight gain during pregnancy and the importance of monitoring and controlling blood glucose during the perinatal period. In addition to these, advising

women of the risk to their infants including developing obesity, heart disease and diabetes in the future are included. In practice, these messages are important but as rightly pointed out by the authors difficult to implement in practice when Aboriginal families are faced with the challenges associated with the social determinants of health. The ongoing issue of food security including availability and cost, particularly for remote Australian Aboriginal communities, has and is an ongoing concern. Currently, there is a national inquiry into food security and cost in remote Aboriginal communities, however, we may not see any immediate change as a result of this inquiry. [3]

There have been many public health approaches that have been identified to improve hyperglycaemia during pregnancy such as providing outreach programmes and diabetes prevention programmes whilst ensuring that culturally safe care is provided. [4] In addition to these, we also believe the delivery of family-centred care programs where the focus is on the child and stresses the importance of immediate and extended family, as well as the home environment, is important to delivering public health messages. [5] Ideally family-centred care programs also consider other points of care delivery including antenatal care, early childhood programs, family support and early intervention, domestic violence programs which are all aimed at creating a safe and supportive family unit. Aboriginal Community Controlled Health Organisations and First Nation health services are well placed to deliver this program of care to their families. [6,7]

With the advances in technology, big data and a better understanding of diseases and in particular the heterogeneity of diabetes, First Nation's peoples must have the same access to advances in healthcare. This includes precision medicine, which is an emerging approach to disease prevention and treatment that is based on individual variability in genes, environment and lifestyle. Although this has yet to be translated into clinical practice, the time to consider how communities are part of the conversation and have access to these treatments is paramount to ensuring eq-

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uitable access to these services. [8] Already researchers have successfully worked with Aboriginal communities for the collection of genomic data in chronic disease an important precursor to delivering precision medicine. [9]

Although not in the scope of the current study we notice a downward trend in gestational diabetes for Aboriginal women from just before 2015. We believe this would be good to explore and perhaps provide some insight into promising public health messages or programs that are currently being trialled. We are interested in seeing if this downward trend continues.

The authors have provided compelling evidence of the ongoing and increasing issue of diabetes in pregnancy, its impact on the infant and the implications of these to the broader community. The relationship the authors have with this important cohort and their ability to analyse data with an understanding of the issues and nuances, reinforces the outcomes presented in this study. This evidence supports further research on the impact of high birth weight and the long term effects it will have on the health and well-being of these children as they grow and get older.

Author contributions

NAS and DM contributed to the overall concept of the work, NAS drafted the first version and DM revised for interpretation and intellectual content.

Declaration of Competing Interest

We declare no conflict of interests.

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