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Stillbirth risks and rate for Aboriginal and Torres Strait Islander women and their babies in North Queensland

RUNNING HEAD: Stillbirth: Indigenous families in Nth Qld

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Abstract

Background: The stillbirth rate for Australian Aboriginal and Torres Strait Islander infants remain higher than non-Indigenous rates. Risks for stillbirth include maternal factors such as ethnicity, age, geographic location, and physical health. Fetal risk factors include gestational age, birthweight, and congenital anomalies. The total stillbirth rate for all babies born at the xxx during the study period was 11 per 1000 births.

Aims: To identify Aboriginal and Torres Strait Islander stillbirth rates, risk factors and causes in North Queensland.

Materials and Methods: A retrospective chart audit was conducted to identify Indigenous women who had experienced stillbirth in the Townsville University Hospital between January 2005 and December 2014.

Results: Thirty-two charts were available for audit. The stillbirth rate for non-Indigenous infants was 10.3 per 1000 births. The stillbirth rate for Indigenous infants was 11.7 per 1000 births. Almost half of the women lived in rural, remote or very remote areas. Maternal risk factors included poorer physical health, such as obesity, diabetes, hypertension, and smoking, fertility issues and lack of antenatal care. Fetal risk factors included congenital anomalies, including cardiac and skeletal abnormalities, placental disorders, and preterm birth.

Conclusions: Stillbirth risk remains higher for Aboriginal and Torres Strait Islander women and their babies. Supporting women to enhance their health is paramount, particularly during pregnancy. Further, increasing awareness of stillbirth risk factors through education for both

women and health care professionals will support culturally responsive care for women and their families to mitigate stillbirth risk and enhance pregnancy outcomes in non-urban Queensland.

Short Communications: The stillbirth rate for Aboriginal and Torres Strait Islander infants remains higher than rates for non-Indigenous infants. The rate for all births in North Queensland is similar across cultural groups. Stillbirth risk factors includes poorer maternal health, including fertility issues, diabetes, obesity and smoking, and fetal risk factors such as congenital anomalies, placental disorders, and preterm birth. Ethnicity, geographical location, and a lack of antenatal care are risk factors for stillbirth in North Queensland. Education for women and health care professionals will help to support women and their families to enhance pregnancy outcomes in non-urban Queensland.

Introduction

The estimated worldwide stillbirth rate is 18.4 per 1000 birth and has declined from 24.7/1000 births in 2000¹. While definitions of stillbirth differ across countries, there are clear disparities across population groups²⁻¹¹. For example, in Latin America, the rate ranges from 3.1 to 24.9, 1000 births, with over 10 countries in that region with stillbirths over 10/1000 births¹⁰. In low to middle income countries, the rate is estimated at 26.4/ 1000 births with an average decline of 3% between 2010 and 2016¹¹. In the US, the estimated rate is 6.1/1000 births, with disparities between groups ranging from 4.9 for non-Hispanic white Americans, to 10.6 for non-Hispanic black Americans⁸.

The rates of stillbirth rates for Indigenous peoples globally are generally much higher than rates for non-Indigenous people, ranging between 5.7/1000 births for Quebec's First Nations people³, 7.0/1000 births for Aotearoa New Zealand Maori people, and 7.5/1000 births for Pacific peoples⁹. In Australia, while the overall stillbirth rate is 7.0/1000 births, the stillbirth rate for Australian Aboriginal and Torres Strait Islander people¹ remains stubbornly higher at 11.5/1000 births⁴. The stillbirth rates for Australian Indigenous people varies across states^{2,6,7}, and while there has been a reported reduction in absolute numbers of Indigenous stillbirths², overall there has been little reduction in rates since 2008 (11.2/1000 births)^{2,4,6}.

There are similarities in maternal risk factors for stillbirth across population groups. Demographic risk factors include maternal age (less risk between 20-35 years)^{2,11}, lower education, living in a non-urban area and lower GDP country¹⁰. Poorer social contexts, including a lack of social support, financial and relationship issues, or domestic violence also increased the risk of stillbirth^{2,5}. Stillbirth risk also rose for women with increasing number of births (>3), lower fertility^{5,10}, delivered outside of area with a larger health facility¹⁰, or

¹ We respectfully refer to Aboriginal and Torres Strait Islander peoples as Indigenous people throughout the paper and acknowledge the distinct cultural groups

received no antenatal care ¹¹. However, others have noted a lack of risk for antenatal care ⁵, particularly if mothers received more than eight antenatal care visits ⁷. Maternal medical risk factors include hypertension ^{2,3,7}, diabetes ^{3,5,7}, smoking ^{3,7}, a Body Mass Index over 40 ^{2,5}, placental dysfunction, including antepartum haemorrhage, and pre-term birth ^{4,7}.

Fetal risk factors include poor fetal growth ^{2,3,7,9}, congenital anomalies ^{3,4,9}, placental disorder ³, gestational age and birthweight ^{5,9}. In Australia, the leading causes of Indigenous stillbirth are fetal congenital anomalies (16%) and spontaneous pre-term birth (12%) ⁴. Other causes include being small for gestational age, low birthweight, with most families in low social-economic circumstances regardless of birth outcome ⁴.

The Townsville University Hospital provides tertiary perinatal care for people of North Queensland and has an annual birth of 10,000. The catchment area includes a population of over 720,000 people and an area of approximately 750,000 square kilometres. There is little accurate data across states to inform care for these women and families, and very few autopsies are conducted to enhance understanding of causation of stillbirth or potential risk factors ¹². In the current pilot study, we sought to identify Aboriginal and Torres Strait Islander stillbirth rates, risk factors and causes in the regional, rural and remote catchment of the Townsville University Hospital.

Materials and Methods

Approximately 8% of Townsville population are people of Aboriginal and Torres Strait Islander descent. This percentage is significantly higher than the estimated Queensland (4.6%) and Australian (3.3%) Indigenous population. Further, in the research site, the Queensland Outer regional, remote, and very remote persons are 2.5 times higher than national rate ¹³. Approximately 40% of Queensland's Aboriginal and Torres Strait Islander population live in the Townsville University Hospital's catchment area ¹⁴. The Townsville

University Hospital is the tertiary referral service for Northern and parts of central Queensland. The Townsville University Hospital Maternal Fetal Medicine (MFM) service provide care for high risk pregnancies and early preterm births across the catchment area.

A retrospective chart audit was conducted to identify Indigenous women who had experienced stillbirth in the Townsville University Hospital between January 2005 and December 2014. A ten-year time frame was selected to ensure a sufficient number of cases available for analysis. Furthermore, MFM services became part of standard care since 2008. The local perinatal mortality audit data indicated 46 Indigenous stillbirths for this time period, however, 32 patient charts were available for audit. Of these, 29 women identified as an Aboriginal woman and 3 identified as an Aboriginal and Torres Strait Islander woman. These 32 stillbirths represented 0.81% of all Indigenous births and 0.14% of all births at the Townsville University Hospital during the study time period. Most women were partnered or in a defacto relationship. Approximately half of the women lived in a regional centre, while almost 50% lived in the greater rural/remote/very remote area. See Table 1 for demographic details of the women and infants. Ethics approval for this study was obtained from the Townsville University Hospital Health Research Ethics Committee (15/QTHS/91).

INSERT TABLE 1 HERE

Results

The Indigenous and non-Indigenous stillbirth rate for births at the Townsville University Hospital in North Queensland are similar (see Table 2).

INSERT TABLE 2 HERE

Of the 32 identified patient charts, stillbirths included 18 (56%) female infants and 14 (44%) male infants. Stillbirth occurred in the 2nd (n=17; 53%) and 3rd (n=15; 47%) trimester. Results of 12 (37.25%) autopsies were recorded. Other families either declined permission to autopsy, were not asked or the reason for not conducting an autopsy was not recorded in the

chart. As indicated in Table 3, most stillbirths were of high-risk pregnancies and approximately a quarter of women attended less than 2 antenatal appointments.

INSERT TABLE 3 HERE

Cause of death – autopsy and other postpartum investigation results

We used the Perinatal Society of Australia and New Zealand's Clinical Practice Guideline¹⁵ to classify the causes of stillbirth. Autopsy was carried out in 12 of the fetuses. In nine fetuses, the cause of death was classified as congenital anomaly (N=4), placental dysfunction (N=3), perinatal infection (N=1) and maternal condition (N=1). Table 4 provides a more detailed diagnosis for stillbirth. In the remaining 20 fetuses, cause of death was determined in five fetuses (perinatal infection (N=2), placental dysfunction (N=3) based on other tests such as placental histopathological examination and culture. In the majority of the patients without autopsy, cause of death could not be identified.

INSERT TABLE 4 HERE

Discussion

The Aboriginal and Torres Strait Islander stillbirth rates in North Queensland (11.5/1000) are approximately twice the non-Indigenous stillbirth rates in Australia^{2, 4, 6, 7} and the US⁸, however reflect those of other global disadvantaged groups^{8, 10, 11}. The stillbirth rates in the current manuscript are approximately twice that of other First Nations peoples in Quebec (5.7)³ and Aotearoa New Zealand and Pacific peoples (7.0 and 7.5 respectively)⁹, and on parity with the overall Australian Indigenous stillbirth rates^{2, 4, 6, 7}. More than half of the women in the current study lived in a regional centre and more than a third lived in rural, remote, or very remote areas. Such geographical isolation from large tertiary healthcare facilities has been identified as a risk factor for stillbirth¹⁰. Distance is often a deterrent to

receiving health care. Women often travel many hours for health care thus increasing the burden on these women during pregnancy.

As others have identified, social risk factors were also identified in the current study. These factors included smoking (62.5%)^{3,7}, other substance use (12.5%), and domestic violence^{2,5}. While others have identified a lack of social support as a risk factor^{2,5}, in the current study, despite these poor social indicators, almost three quarters of women enjoyed family support. Mental health and mood disorders were also present for women in the current study. These disorders may also represent risk for these women. It may be that poorer mental health disrupted help-seeking and receiving standard care when attending routine appointment. Given the relationship between mental health and stillbirth, it is important for health care professionals to conduct mental health screening during the perinatal period.

Maternal risk factors in the current study are similar to those identified by others, including increased number of pregnancies and fertility issues, including miscarriage^{5,10}, and receiving little to no antenatal care¹¹. Other identified maternal risk factors include diabetes^{3,5,7} and hypertension^{2,3,7}. While BMI >40 has been identified by others as stillbirth risk^{2,5}, in the current study, a BMI >30 was present for several women. It may be that a lower BMI, but still in the obese range, with concomitant risk of diabetes and hypertension contributes risk of stillbirth for Aboriginal and Torres Strait Islander women.

Mirroring the leading causes of Indigenous stillbirth in Australia^{4,7}, the causes identified in our study included congenital anomalies, including skeletal and cardiac anomalies^{3,4,94,5,7,9} placental disorders^{3,4,7} and hydrops. For those women who did not consent for autopsy after stillbirth, other test results also identified placental disorders, including structural and functioning disorders, hydrops, hypoxia, fetal infection and cord restrictions as stillbirth risk factors. Additionally, maternal infection and autoimmune disorder were also present in those women who experienced stillbirth.

Limitations

Only 32 cases were included in this study and this is an important limitation of study. Nevertheless, the paucity of information in this area makes the information obtained by this study valuable despite its sample size. There was a discrepancy between the identified number of Indigenous stillbirths and available charts for audit in the current study. Therefore, stillbirth risks identified in these charts is unknown and may not be represented in the current study. There was difficulty reviewing all the individual patient records and for those cases we were reliant on summary perinatal mortality data following review of each perinatal death, as some paper charts could not be located or had been destroyed. During the time period of the chart audit (2005-2014), all charts were paper based with hand-written notes. Given the complex nature of health care for vulnerable women, complete files often comprised several charts. Knowledge of how many charts to include was required so that all charts were ordered and retrieved. Further, the financial implications of charging work groups within the hospital for file retrieval may have further hampered gathering complete data. A further difficulty was a lack of consistency in taxonomy, particularly in the use of acronyms, between files and encounters, which often made it difficult to group similar experiences and greatly increased the time to complete the audit. The hospital has since moved to an electronic system for medical records. Moving to the electronic system may improve the record keeping for actual numbers of stillbirths and retrieving of files for audit.

Conclusions

In Australia, the rates of Indigenous stillbirth are almost twice as high as non-Indigenous stillbirth, however, this was not the case in this study. Indigenous and non-Indigenous stillbirth rates recorded in North Queensland were similar (11.7 and 10.3 respectively) and higher than the national average (Indigenous: 11.5 vs Non-Indigenous: 7). This rate is unacceptably high. However, the tertiary referral service for Northern and parts of

central Queensland and the high stillbirth rate may reflect the high risk pregnancies referred to our Maternal Fetal Medicine service, especially preterm complications as reflected in mean gestation of our Indigenous stillbirths of 27 weeks gestation. Additionally, for our regional, rural, remote, and very remote women, it may be that living in a non-urban area that is a strong contributing factor for stillbirth in all cases. Overall, risk factors in the current study were similar to those reported globally, with similar risk factors reported across Indigenous communities across Australia. The current study highlights the need for mental health screening to support women to gain access to health care services. As others have noted, increased access to antenatal care appears to ameliorate stillbirth risk. The rates of substance use, including smoking and other substances, and gynaecological issues were also high in this study. Supporting women to enhance their health is paramount, particularly during pregnancy. Leveraging established family kinship support networks may provide a holistic approach to supporting women during the perinatal period. Further, increasing awareness of stillbirth risk factors through education for both women and health care professionals will help to provide culturally responsive care for women and their families to mitigate stillbirth risk and enhance pregnancy outcomes in non-urban Queensland.

Table Legend

Table 1. Aboriginal and/or Torres Strait Islander women who experienced stillbirth in regional North Queensland 2005-2014

Table 2. Indigenous and non-Indigenous stillbirth rates in North Queensland

Table 3. Maternal medical history and social factors

Table 4. Cause of death determined from autopsy

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