

Hapū with Omicron—the Wellington experience. Maternal and neonatal outcomes of pregnant people diagnosed with COVID-19

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International research demonstrated that pregnant people had more severe illness and pregnancy outcomes when infected with COVID-19.¹⁻³ However, much of these data were obtained prior to the availability of vaccinations. COVID-19 vaccination and booster doses were made available in Aotearoa in 2021 and were recommended for pregnant people.

In Wellington, the first COVID-19 outbreak to significantly affect pregnant people occurred in early 2022, when the predominant strains were the Omicron variants BA.1 and BA.2.⁴ This cohort of pregnant people differed from those described in international literature as vaccination was mandated and over 90% of the eligible population were vaccinated,⁵ but presumed to have no natural immunity.

In Wellington (Capital & Coast District Health Board [CCDHB]), from February to June 2022, pregnant people diagnosed with COVID-19 were notified to hospital maternity services and followed up as required with phone calls, clinical review and an additional third trimester ultrasound. Hospital obstetric staff reviewed all notifications and contacted pregnant people, liaised with community midwives and general practitioners and provided follow-up as required.

We aimed to describe the obstetric and neonatal outcomes of pregnant people diagnosed with COVID-19 between February and June 2022 in CCDHB.

Methods

A retrospective review of paper and electronic records was undertaken of pregnant people diagnosed with COVID-19 and notified to hospital maternity services between February and June 2022. Select demographic information, vaccination status and clinical outcomes were collected from multiple data sources (Table 1). Self-identified

ethnicity was classified in the clinical records according to Manatū Hauora – Ministry of Health prioritised ethnicity.⁶ If a customised birthweight centile was not available, a customised GROW chart was created retrospectively, and the baby's birthweight plotted. Where there was variation in data such as body mass index (BMI), the perinatal information management system (PIMS) information was used. If clinical information differed, it was cross checked against clinical coding and medical records, including radiology findings.

We did not have a control group to compare our data to, as some people would have had asymptomatic or unreported infections or had COVID-19 during their pregnancy but not within the five months we collated data from.

Medical records of pregnant people who were admitted to hospital with COVID-19 were reviewed retrospectively, and the COVID-19 was classified by an obstetrician (JO) as being coincidental to admission, contributing to admission or the direct cause of the admission. Coincidental admissions were events such as labour or planned caesarean section. COVID-19 contributed to the admission when someone had a pre-existing condition made worse by COVID-19 (e.g., hyperemesis) or was directly responsible for the admission when a previously well person developed symptoms attributed to COVID-19, e.g., pneumonia.

This was classed as a service evaluation and approval was granted by the CCDHB Women's Health Service Research and Audit Committee.

Results

Obstetric services were notified of 532 pregnant people diagnosed with COVID-19. Pregnancy outcomes were obtained for 514/532 pregnant people (97%) and 520 babies (the cohort included six sets of twins). Three pregnant people had

Table 1: Data sources and variables.

Data source	Obstetric or neonatal variable
Medical App Portal (MAP)	Age, pregnant person ethnicity, BMI, gestation at diagnosis of COVID-19, COVID-19 vaccination status, hospitalisation with COVID-19, ICU admission, mode of birth, gestation at birth, diagnosis of preeclampsia, birthweight centile
Perinatal Information Management System (PIMS)	Age, parity, BMI, induction of labour, mode of birth, blood loss at birth, gestation at birth, NICU admission, birth weight centile
Community radiology providers	Additional third trimester ultrasound
Hospital coding	Hospital admission, gestation at birth, birth outcome, mode of birth, induction of labour, birthweight, pre-eclampsia, BMI, ICU admission, venous thromboembolism (VTE)
NZDep2018 online map tool ⁷	Area deprivation based on residential address

Table 2: Ethnicity and deprivation quintiles of our cohort of those diagnosed with COVID-19 in pregnancy and the total 2022 CCDHB birthing population.

	Cohort of people diagnosed with COVID-19 in pregnancy		Total CCDHB birthing population	
	N	%	N	%
Deprivation quintile				
1 Least deprived	144	27.1	930	28.9
2	105	19.7	568	17.7
3	98	18.4	547	17.0
4	69	13.0	640	19.9
5 Most deprived	116	21.8	532	16.5
Prioritised ethnicity				
Māori	97	18.2	504	15.7
Pasifika	81	15.2	327	10.2
Asian	46	8.6	361	11.2
Indian	38	7.1	241	7.5
NZ European	199	37.4	1,291	40.1
Other European	48	9.0	375	11.7
Other	23	4.3	118	3.7
	532		3,217	

Table 3: Pregnancy outcomes for people diagnosed with COVID-19 and total for CCDHB in 2022.

	Cohort of people diagnosed with COVID-19 during pregnancy		Total CCDHB birthing population	
	N	%	n	%
Hypertensive disorders of pregnancy (gestational hypertension and pre-eclampsia)	22	4.3	201	6.2
Caesarean section	152	29.6	1,182	35.3
Postpartum haemorrhage $\geq 1,000\text{mL}$	49	9.5	328	10.2
Induction of labour	126	24.5	852	26.5
Pre-term birth (<37 weeks)	30	5.8	205	6.4
NICU admission	58	11.2 ^a	530	16.5
Total	514		3,217	

^aThere were 520 babies (six sets of twins), so the denominator here is 520.

COVID-19 twice in the five-month follow-up period. Of this cohort, 39 (7.3%) were unvaccinated, 7 (1.3%) had received one dose of vaccine, 197 (37%) 2 doses, 287 (53.9%) 3 doses and 2 (0.4%) 4 doses.

Ethnicity data and deprivation quintiles of those diagnosed with COVID-19 in pregnancy are shown in Table 2, alongside those of the total 2022 CCDHB birthing population.

There were no maternal deaths, intensive care admissions or diagnosed thromboembolisms in our cohort. Thirty-seven pregnant people (7%) were admitted to hospital. COVID-19 was deemed the direct cause of hospitalisation for three, contributed to admission in 16 cases (e.g., hyperemesis exacerbated by COVID-19) and was coincidental (e.g., at time of labour) in the remaining 18 admissions. Of the 3/514 people admitted to hospital with COVID-19 classed as the direct cause of their hospitalisation, they were admitted for a maximum of 2 nights in hospital. One person had received 1 dose of vaccine, one person 2 doses and one person 3 doses. Seventy-nine percent of the 385 people eligible for a third trimester growth scan had one. Eight percent of babies (40/520) were small for gestational age or low birth weight (defined as a birthweight <2,500g or <tenth customised centile on a GROW chart). There were two stillbirths.

Rates of caesarean sections, pre-term birth, induction of labour, post-partum haemorrhage >1,000mls, hypertensive disorders and NICU admission are shown in Table 3 alongside total rates for the 2022 birthing population within CCDHB (over the same time of the study period).

Conclusions

Wrap-around care, planning and cooperation between primary and hospital services and high vaccination rates of a recently vaccinated population allowed most pregnant people diagnosed with COVID-19 between February and June 2022 to be managed in the community, and likely contributed to mitigating the adverse outcomes seen overseas.¹⁻³ Our findings differed from the INTERCOVID 2022 data cohort describing pregnancy outcomes when Omicron was the dominant strain.⁸ This study reported COVID-19 in pregnancy was associated with an increased risk of maternal morbidity and mortality, although unlike in our cohort, one third of this population were unvaccinated.

Strengths of this dataset were obtaining birth outcomes for 97% of people reported to have had COVID-19 during the study period and a high representation of non-Pākehā ethnicities.

We acknowledge the limitations of our data

cohort. All data was collected retrospectively. Direct comparisons with pregnant people who did not contract COVID-19 were unable to be made, as it is not known how many pregnant people experienced asymptomatic infections or if every case diagnosed with COVID-19 was referred to maternity services. Some pregnant people will have been diagnosed with COVID-19 outside of the February to June study period. While birthing outcomes in this cohort were comparable to the Wellington birthing population, causality cannot be made from these findings. We have not been able to assess whether the timing of the COVID-19 infection or vaccination status influenced pregnancy outcomes. Despite these limitations, these data are noteworthy for the lack of serious complications experienced in this high-risk group

(pregnant people) of a diverse population in Aotearoa.

The data collection process was challenging, requiring the manual and time-consuming review of multiple databases. This highlights the need for a national, integrated maternity database, which would also allow ongoing epidemiological surveillance and outcome monitoring. We are not aware of any ongoing collection of pregnancy outcomes in Aotearoa in people who have had COVID-19 during their pregnancy, nor are we able to collect these data locally given the limitations of our current databases. As vaccination booster rates drop, we have some natural immunity and COVID-19 becomes endemic, it will be important to monitor and assess any ongoing impact of COVID-19 on birthing and childhood outcomes.

COMPETING INTERESTS

Nil.

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