

A Survey of Gestational Diabetes in Broken Hill

Dr Grace Ting (MD/Bsc), Dr Max Mongelli (MBBS (Syd), Dip Obs, DM (Notts), FRANZCOG, FRCOG)

Background

Gestational diabetes (GDM) is a common health issue in Australia, affecting around 16% of pregnancies. It is a routine to screen all pregnant women with a test known as 75g OGTT. This survey is to determine the prevalence and characteristics of GDM in pregnant women in Broken Hill. In addition to that, the secondary objective is to study the birth outcomes of pregnancies complicated by GDM in Broken Hill.

Methodology

The clinical details of all singleton live births in the past 24 months until March 2021 were retrieved from the Obstetric database in Electronic Medical Record (EMR), and downloaded as an electronic Excel spreadsheet. IBM SPSS 24 was used to analyse and generate the statistics. After excluding cases with missing data, the final number of patients was 364.

Outcome

Among the data gathered, 28.3% had some form of diabetes. Maternal obesity had a significant effect. The caesarean section rate was higher in patients with GDM (37.9%) as compared to patients without diabetes (29.9%). Similarly, the rate of instrumental birth was higher in GDM group (8.7%) as compared to group without diabetes (6.5%). Patients without diabetes were found to have higher rate of normal vaginal delivery (63.6%) compared to patients with GDM (53.4%). Patients with GDM were noted to have higher percentage of emergency birth (14.6%) than non-diabetic patients (13.0%). Newborns of patients without diabetes had lower median weight (3350±688.17) as compared with patients with GDM

As for ultrasound findings, the median foetal BPD was found to be lower (84.5±18.22) in patients without diabetes as compared to patients with GDM. Amongst patients with GDM, those who were on insulin control had the highest foetal BPD (91.0±2.83).

Conclusion

As this is the preliminary survey, more studies need to be carried out in the future to strengthen the understanding of gestational diabetes in Broken Hill community. Nevertheless, gestational diabetes is an important health issue in pregnancy that needs to be addressed in order to formulate a more wholesome and comprehensive care for both the mother and the fetus. Given the high incidence, it would be justified to adopt a policy whereby early screening for GDM is carried out on all women, rather than just those with risk factors.



Illustration 1.1 Diabetes status of pregnancy from 2019-March 2021 in Broken Hill Hospital

Diabetes status	Frequency	Percentage
No diabetes	261	71.7
GDM on diet control	68	18.7
GDM on oral hypoglycaemic	31	0.09
GDM on insulin	2	0.01
Pre-existing T2DM	2	0.01

Illustration 1.2 Percentile of maternal age (years)

Diabetes status	Median	Interquartile range
No diabetes	28	8
GDM on diet control	29	6
GDM on oral hypoglycaemic	30	9
GDM on insulin	35	nil
Pre-existing T2DM	31	nil

Illustration 1.3 BMI in subgroups of GDM (kg/m²)

Diabetes status	25% percentile	50% percentile	75% percentile
No diabetes	21.8	25	29.1
GDM on diet control	23.6	28.7	33.5
GDM on oral hypoglycaemic	26.4	31.5	36.1
GDM on insulin	38.8	39.8	nil
Pre-existing T2DM	22.3	31.8	nil

Illustration 1.4 Percentile of gestation age (weeks)

Diabetes status	25% percentile	50% percentile	75% percentile
No diabetes	38.4	39.3	40.2
GDM on diet control	38.4	39.1	39.9
GDM on oral hypoglycaemic	38.6	39.3	39.6
GDM on insulin	36.1	37.6	nil
Pre-existing T2DM	39.1	39.3	nil

Illustration 1.5 Frequency of mode of delivery in GDM and non-diabetic

Diabetes status	Frequency	Normal vaginal birth	Instrumental birth	Caesarean section
No diabetes	Count	166	17	78
	% within Diabetes status	63.60%	6.50%	29.90%
	% within Mode of Delivery	75.10%	65.40%	66.70%
GDM/Pre-existing T2DM	Count	55	9	39
	% within Diabetes status	53.40%	8.70%	37.90%
	% within Mode of Delivery	24.90%	34.60%	33.30%

References

Nankervis A, Price S, Conn J. Gestational diabetes mellitus: A pragmatic approach to diagnosis and management. *Australian Journal of General Practice*. 2018;47(7):445-449.

Nankervis A, McIntyre H, Moses R, Ross G, Callaway L, Potter C et al. ADIPS Consensus Guidelines for the Testing and Diagnosis of Hypertension in Pregnancy in Australia and New Zealand [Internet]. 2014. Australasian Diabetes in Pregnancy Society and Advance Pregnancy Outcomes: The HAPO Study Cooperative Research Group. *Obstetrical & Gynaecological Survey* [Internet]. 2008;6(10):615-616. Available from: <https://pubmed.ncbi.nlm.nih.gov/18403374/>

Metzger H, Buchanan T, Coustan D, de Leiva A, Dugan D, Hodson D et al. Summary and Recommendations of the Fifth International Workshop-Conference on Gestational Diabetes Mellitus. *Diabetes Care*. 2007;30(Supplement 2):S223.

Falanga M, Schmidt M, Dupuis J, Averb L, Wendland E, Jakob M et al. Effectiveness of gestational diabetes treatment: A systematic review with quality of evidence assessment. *Diabetes Research and Clinical Practice*. 2012;98(3):379-384.

Hawkins J, Casey B. Labor and Delivery Management for Women With Diabetes. *Obstetrics and Gynecology Clinics of North America*. 2007;34(2):323-331.

Wassenaar N, Kemp M, Hoek M. Short and long-term complications in offspring of diabetic mothers. *Journal of Diabetes and its Complications*. 1996;10(5):294-301.

Li Z, Cheng Y, Wang D, Chen H, Chen H, Meng W et al. Incidence Rate of Type 2 Diabetes Mellitus after Gestational Diabetes Mellitus: A Systematic Review and Meta-Analysis of 170,139 Women. *Journal of Diabetes Research*. 2017;2017:1-11.

Perinatal and Regional NSW Local Health Network [Internet]. Health.nsw.gov.au. 2011 [cited 4 March 2022]. Available from: https://www.health.nsw.gov.au/publications/PerinatalandRegionalReport2010-11/14NSW_H110-Rank-HealthStatusNSW [Internet]. Population health data in your finger tip. 2021 [cited 4 March 2022]. Available from: http://www.healthstatus.nsw.gov.au/indicators/mab_bbb_mab_bbb_jgmsup_trend

Broken Hill City | Community profile [Internet]. Profile.com.au. 2022 [cited 4 March 2022]. Available from: <https://www.profile.com.au/broken-hill/communities/broken-hill>

NSW Mothers and Babies 2018 [Internet]. Health.nsw.gov.au. 2022 [cited 4 March 2022]. Available from: <https://www.health.nsw.gov.au/news/Publications/mothers-and-babies-2018.pdf>

Incidence of gestational diabetes in Australia [Internet]. 2019 [cited 4 March 2022]. Available from: <https://www.aihw.gov.au/getmedia/281608c-5095-2d41-6979-685164f0023/incidence-of-gestational-diabetes-in-australia.pdf>

Nankervis A, McIntyre H, Moses R, Ross G, Callaway L, Potter C et al. 2014. Australasian Diabetes in Pregnancy Society consensus guidelines for the testing and diagnosis of gestational diabetes mellitus in Australia. Sydney: Australian Diabetes in Pregnancy Society; 2014.

Australian's Mothers and Babies 2017 in Brief [Internet]. Aihw.gov.au. 2017 [cited 4 March 2022]. Available from: <https://www.aihw.gov.au/getmedia/2a0c222-ba27-4b0b-a477-6b6e1854c66/aihw-per-106-in-brief.pdf.aspx?inline=true&:text=The%20report%20of%20mothers%20and%20babies%20in%2019%25%20to%2021%25%20&:text=The%20average%20age%20of%20first%20birth%20in%202019%25%20to%2021%20>



Illustration 1.6 Frequencies of elective/emergency birth in different diabetes status

Diabetes status	Frequency	Elective	Emergency	Total
No diabetes	Count	227	34	261
	% within Diabetes status	87.00%	13.00%	100.00%
GDM/Pre-existing T2DM	Count	88	15	103
	% within Diabetes status	85.40%	14.60%	100.00%

Illustration 1.7 Frequencies of parity in different diabetes status

Diabetes status	Frequency	Primipara	Multipara	Total
No diabetes	Count	108	153	261
	% within Diabetes status	41.40%	58.60%	100.00%
GDM/Pre-existing T2DM	Count	39	64	103
	% within Diabetes status	37.90%	62.10%	100.00%

Illustration 2.1 Percentile of newborn weight (g)

Diabetes status	Median	Standard Deviation
No diabetes	3350.0	688.17
GDM on diet control	3445.0	388.07
GDM on oral hypoglycaemic	3565.0	481.82
GDM on insulin	3248.0	632.15
Pre-existing T2DM	3545.0	7.07

Illustration 2.2 Percentile of foetal USS BPD (mm)

Diabetes status	Median	Standard Deviation
No diabetes	84.5	18.22
GDM on diet control	89.0	4.91
GDM on oral hypoglycaemic	89.0	4.48
GDM on insulin	91.0	2.83
Pre-existing T2DM	89.0	12.73

Illustration 2.3 Percentile of foetal USS HC (mm)

Diabetes status	Median	Standard Deviation
No diabetes	308.0	63.15
GDM on diet control	317.5	18.58
GDM on oral hypoglycaemic	318.0	14.62
GDM on insulin	316.5	13.44
Pre-existing T2DM	317.0	14.14

Illustration 2.4 Percentile of foetal USS AC (mm)

Diabetes status	Median	Standard Deviation
No diabetes	304.0	75.34
GDM on diet control	323.0	23.78
GDM on oral hypoglycaemic	325.0	26.40
GDM on insulin	326.5	20.51
Pre-existing T2DM	311.0	9.90

Illustration 2.5 Percentile of foetal USS FL (mm)

Diabetes status	Median	Standard Deviation
No diabetes	65.5	15.88
GDM on diet control	68.0	4.41
GDM on oral hypoglycaemic	68.0	7.54
GDM on insulin	65.0	4.24
Pre-existing T2DM	63.0	9.90



RANZCOG *Regional*
SYMPOSIUM
2023 Hobart