



Maternal and Perinatal outcomes in Gestational Diabetes Mellitus versus group with no Gestational Diabetes Mellitus: a comparative study from Malaysian tertiary hospitals

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INTRODUCTION

Pregnancy is a diabetogenic state manifested by insulin resistance and hyperglycaemia. Gestational Diabetes Mellitus (GDM) is glucose intolerance with the onset first recognized during pregnancy. Women with GDM give birth to healthy babies when their blood glucose levels are well controlled by diet, exercise and appropriate body weight.

OBJECTIVE

The objective of this study was to see the maternal and perinatal outcomes in pregnancies complicated by Gestational Diabetes Mellitus versus non Gestational Diabetes Mellitus pregnancies in Malaysian tertiary hospitals

Table 1 : Socio demographic characteristics of mothers

Variable	Total deliveries	Mother with GDM compare to mother without any medical problem						
		No GDM		Yes GDM		Crude OR	(95% CI)	P value ^a
n	(%)	n	(%)					
Age								
10-14	397	293	0.10	7	0.02	1.20	(0.56, 2.55)	0.643
15-19	19546	14921	5.32	298	0.92	1.00		
20-24	77066	57312	20.43	2699	8.35	2.36	(2.09, 2.66)	<0.001
25-29	139231	101107	36.05	9210	28.49	4.56	(4.06, 5.13)	<0.001
30-34	97893	67584	24.09	9458	29.26	7.01	(6.24, 7.87)	<0.001
35-39	49968	30848	11.00	7755	23.99	12.59	(11.19, 14.15)	<0.001
40-44	13912	7803	2.78	2671	8.26	17.14	(15.16, 19.38)	<0.001
45-49	1098	580	0.21	217	0.67	18.73	(15.44, 22.73)	<0.001
>=50	78	50	0.02	8	0.02	8.01	(3.77, 17.05)	<0.001
Ethnicity								
Malay	274,535	193,278	69.13	25,077	77.65	1.00		
Chinese	25,024	17,816	6.37	2,158	6.68	0.93	(0.89, 0.98)	0.004
Indian	19,632	13,074	4.68	2,414	7.48	1.42	(1.36, 1.49)	<0.001
Others	46,579	31,222	11.17	1,255	3.89	0.31	(0.29, 0.33)	<0.001
Foreigner	32,460	24,208	8.66	1,389	4.30	0.44	(0.42, 0.47)	<0.001
Parity								
1	137,732	99,325	35.45	8,490	26.28	1.00		
2-5	238,219	166,753	59.52	20,677	64.00	1.45	(1.41, 1.49)	<0.001
>5	22,770	14,103	5.03	3,141	9.72	2.61	(2.49, 2.72)	<0.001
Maternal BMI								
<16.0	2,919	2,318	0.85	128	0.41	0.84	(0.70, 1.01)	0.058
16.0-18.4	20,634	16,620	6.10	850	2.73	0.78	(0.72, 0.84)	<0.001
18.5-22.9	101,686	81,318	29.85	5,345	17.18	1.00		
23.0-27.4	118,630	92,489	33.95	9,131	29.35	1.50	(1.45, 1.56)	<0.001
27.5-32.5	78,267	56,487	20.74	9,390	30.18	2.53	(2.44, 2.62)	<0.001
32.6-37.5	26,571	17,277	6.34	4,269	13.72	3.76	(3.60, 3.93)	<0.001
>37.5	10,420	5,910	2.17	1,999	6.43	5.15	(4.86, 5.45)	<0.001

METHODS

This is a retrospective cohort study over a 3 year period from 1st Jan 2010 to 31st December 2012. Data was obtained from the National Obstetrics Registry, Malaysia which is an online data base that captures data from 14 tertiary public hospitals which represents approximately one third of the deliveries in Malaysia. Statistical analysis performed using STATA 11.0. Chi square analysis was performed to test difference in proportion of categorical variations between two or more groups. Simple logistic regression was used to assess variables in order of importance of risk factor for GDM. P value <0.001 was taken as the cut off value for significance.

Table 2: Maternal complications

Variable	Total deliveries	No GDM		Yes GDM		Crude OR	(95% CI)	P value ^a
		n	(%)	n	(%)			
Cord prolapse								
Yes	740	485	0.17	92	0.28	1.65	(1.32, 2.06)	<0.001
No	398,534	280,019	99.83	32,235	99.72	1.00		
Eclampsia								
Yes	1,053	285	0.10	104	0.32	3.17	(2.53, 3.97)	<0.001
No	398,221	280,219	99.90	32,223	99.68	1.00		
Pre-eclampsia ^b								
Yes	2,799	0	0.00	460	11.13	-		
No	15,635	0	0.00	3,672	88.87			
Genital trauma								
Yes	60,446	49,685	17.71	4,531	14.02	0.76	(0.73, 0.78)	<0.001
No	338,828	230,819	82.29	27,796	85.98	1.00		
PPH								
Yes	2,019	1,208	0.43	320	0.99	2.31	(2.04, 2.62)	<0.001
No	397,255	279,296	99.57	32,007	99.01	1.00		
Macrosomia								
Yes	5,331	3,094	1.10	1,182	3.66	3.40	(3.18, 3.64)	<0.001
No	393,943	277,410	98.90	31,145	96.34	1.00		
APH								
Yes	468	320	0.11	46	0.14	1.25	(0.92, 1.70)	0.160
No	398,806	280,184	99.89	32,281	99.86	1.00		
PIH ^b								
Yes	13,113	0	0.00	2,992	9.26	-		
No	386,161	280,504	100.00	29,335	90.74			
Caesarean Section								
Elective	22,067	14,076	22.98	3,184	27.87	1.30	(1.24, 1.35)	<0.001
Emergency	72,927	47,176	77.02	8,239	72.13	1.00		
Labour								
Spontaneous	320,984	243,211	86.71	25,951	80.28	0.62	(0.61, 0.65)	<0.001
Induced	71,660	50,414	17.97	8,213	25.41	1.55	(1.51, 1.60)	<0.001

Note: ^a Simple Logistic Regression; OR = odds ratio; 95% CI = 95% confidence interval.
^b The assumptions of Logistic Regression were not met, there must be at least two cases for each category of the dependent.

RESULTS

There were a total of 399,274 deliveries in the study period of which 32,327 deliveries were complicated with GDM. The prevalence of GDM among the study group was 8.09%. Compared with non GDM subjects, GDM patients were older with mean age of 32 years whilst in the non GDM group the mean age was 28.2 years. Indian women had significantly higher GDM at 7.48% as compared to non GDM at 4.68% (p<0.001). Indian women had a 1.42 times more risk of getting GDM (p<0.001) as compared to other races. There was a higher incidence of women with GDM in para 5 and more as compared to the non GDM group (9.72% vs 5.03, p<0.001). Obesity is a significant risk factor and in this study, body mass index >27.5 had a higher incidence of GDM (p<0.001). The higher the BMI the risk of GDM was seen to be greater. Women with BMI >37.5 was seen to have a 5.15 times more risk of GDM. Eclampsia risk was 3.17 times (p<0.001) and Postpartum Haemorrhage risk was 2.31 times (p<0.001) more common among patients with GDM. Women with GDM were more likely to have a Caesarean section (CS) as compared to non GDM (35.78% vs 22.19, p<0.001). There was a higher risk of congenital anomalies, birth injuries, shoulder dystocia and macrosomia among the GDM group.

CONCLUSIONS

Women with GDM in Malaysian tertiary hospitals have increased risk of adverse obstetric and perinatal outcomes. Women aged 45-49 years, Indian ethnicity, BMI 27.5 and more have an increased risk of GDM. From our data approximately 90% of women attending antenatal clinics in the tertiary hospitals have been screened for GDM. To reduce adverse outcomes in baby and mother it is vital to have good glycaemic control and adhere to diet and exercise.

Table 3: Fetal complications

Variable	Total deliveries	No GDM		Yes GDM		Crude OR	(95% CI)	P value ^a
		n	(%)	n	(%)			
Alive;								
Apgar score;								
At 1 min; <7	22,465	15,847	5.78	1,843	5.83	1.01	(0.96, 1.06)	0.693
>7	365,163	258,402	94.22	29,753	94.17	1.00		
At 5 min; <7	5,884	4,402	1.62	406	1.30	0.80	(0.72, 0.89)	<0.001
>7	364,179	268,125	98.38	30,895	98.70	1.00		
Prematurity								
22-36	35,402	25,256	11.65	3,367	13.11	1.05	(1.01, 1.090)	0.016
36-40	221,817	167,710	77.34	21,319	83.03	1.00		
>40	29,024	23,876	11.01	990	3.86	0.33	(0.31, 0.35)	<0.001
Dead;								
FSB	888	598	31.77	49	19.22	1.00		
MSB	1,947	1,284	68.23	206	80.78	1.96	(1.41, 2.71)	<0.001
Congenital Anomaly								
Yes	645	439	0.16	81	0.25	1.60	(1.27, 2.03)	<0.001
No	398,629	280,065	99.84	32,246	99.75	1.00		
Birth injuries								
Yes	107	71	0.03	16	0.05	1.96	(1.14, 3.36)	0.015
No	399,167	280,433	99.97	32,311	99.95	1.00		
Shoulder dystocia								
Yes	758	457	0.16	174	0.54	3.32	(2.78, 3.95)	<0.001
No	398,516	280,047	99.84	32,153	99.46	1.00		
Baby weight								
<2500	66,259	45,188	16.30	4,577	14.30	0.89	(0.86, 0.92)	<0.001
2500-4000	319,675	226,913	81.83	25,836	80.75	1.00		<0.001
>=4000	8,530	5,211	1.88	1,583	4.95	2.67	(2.52, 2.83)	<0.001

Note: ^a Simple Logistic Regression; OR = odds ratio; 95% CI = 95% confidence interval.
^b The assumptions of Logistic Regression were not met, there must be at least two cases for each category of the dependent.

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