Maternal Obesity and Pregnancy outcomes

A cross sectional study from the Malaysian National Obstetrics Registry

SD Karalasingam[1] J Ravichandran[2] SA Soelar[3]

1. National Clinical Research Centre , Kuala Lumpur Hospital 2. Sultanah Aminah Hospital, Johor 3. Clinical Research Centre, Sultanah Bahiyah Hospital, Kedah

INTRODUCTION

Obesity has become a worldwide epidemic. There are concerns to women's reproductive health which ranges from infertility to a wide spectrum of diseases such as hypertensive disorders, coagulopathies, gestational diabetes mellitus, respiratory complications, and fetal complications such as large-for-gestational-age infants, congenital malformations, stillbirth, and shoulder dystocia.

It has been reported that Malaysia is the most obese country in Asia. This study aims to see if obesity is associated with adverse pregnancy outcomes among Malaysians. And if the risk increases with the degree of obesity

METHODOLOGY

This is a 5 year (2010-2015) retrospective cross-sectional study based on data from the National Obstetrics Registry (NOR). NOR is a clinical database that compiles obstetric data from 13 tertiary hospitals and 1 hospital in the Federal Territory in Peninsular and East Malaysia. Ethical approval for the NOR was provided by the Medical Research and Ethics Committee of the Ministry of Health, Malaysia (Approval number: NMRR15-620-25530).

A total of 588,533 singleton vaginal deliveries from the participating hospitals were analysed.

BMI was calculated as weight at antenatal booking (kg), divided by height (m) squared. The subjects were divided into three groups, Non-Obese=BMI <24.9, Overweight=BMI 25.0–29.9 and Obese=BMI >30.0.

The analyses were performed with R version 3.5.0. To study the association between demographic characteristics and BMI group, Pearson's chi-square test for independence was used. Multiple logistic regression was used to test each outcome variable in antenatal, maternal and fetal complications with BMI group, age group, ethnic group, parity, diabetes mellitus and hypertension are included in the model. All probability values were two-sided, and a level of significance of less than 0.05 (p-value < 0.05) was considered as statistically significant.

RESULTS

29.6 % of mothers were overweight whilst 20.5 % of mothers were obese from Malaysian tertiary hospitals. Highest prevalence of severe obesity was in Indian women at 23.2%. 1 in 4 women in their first pregnancy are overweight.2/3rd of women with Diabetes complicating pregnancy are overweight and obese. In this study obesity had no correlation to induction of labour, breech delivery, instrumental delivery, preterm delivery, small for gestational age and low birth weight.

Compared to women with normal BMI and overweight women, the following outcomes was observed in obese women. Emergency Caesarean Section (OR 2.01;95%CI:1.97-2.04) P<0.001, Elective Caesarean section (OR 2.31; 95%CI:2.25-2.38) P<0.001, Macrosomia (OR 4.70; 95%CI: 4.52-4.90) p<0.001 and Shoulder dystocia (OR 2.16; 95%CI: 1.86-2.51) p<0.001.

RESULTS

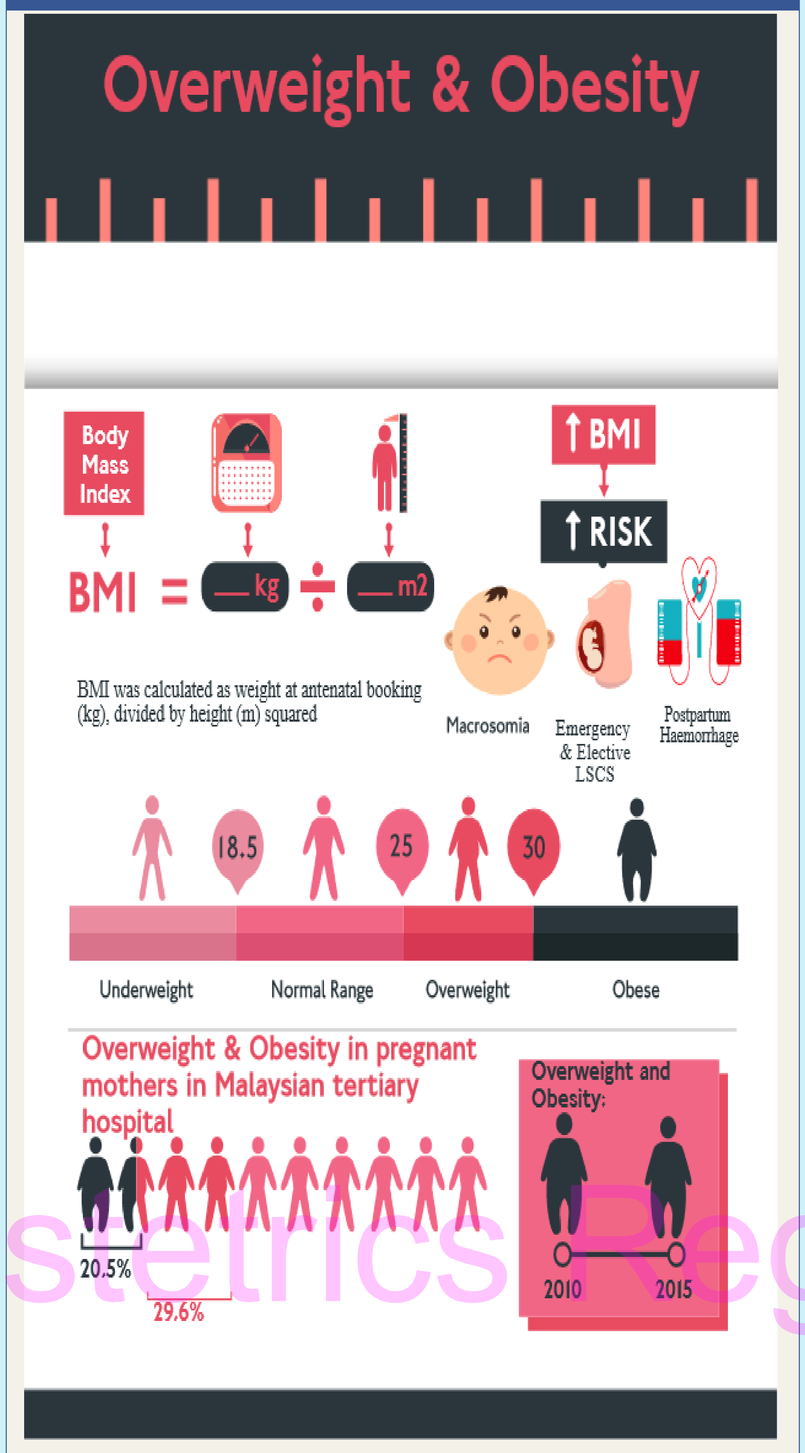

Table I. Association between Maternal complications and BMI

Outcome	BMI Group	n	%	Multiple logistic regression	
				Adj OR (95% CI)	p-value
Gestational diabetes	BMI <24.9	16,516	(5.63)	1.00 (ref)	
	BMI 25.0–29.9	16,691	(9.57)	0.92(0.85,1.00)	0.048
	BMI >30.0	17,310	(14.36)	0.87(0.80,0.94)	<0.001
Pre-eclampsia	BMI <24.9	996	(0.34)	1.00 (ref)	
	BMI 25.0–29.9	1,048	(0.60)	0.86(0.78,0.95)	0.002
	BMI >30.0	1,314	(1.09)	0.69(0.63,0.76)	<0.001
Anaemia	BMI <24.9	30,861	(10.51)	1.00 (ref)	
	BMI 25.0–29.9	13,867	(7.95)	0.75(0.74,0.77)	<0.001
	BMI >30.0	8,354	(6.93)	0.67(0.66,0.69)	<0.001
Genital tract trauma	BMI <24.9	82,357	(28.05)	1.00 (ref)	
	BMI 25.0–29.9	52,171	(29.91)	0.97(0.96,0.99)	<0.001
	BMI >30.0	33,302	(27.62)	0.85(0.84,0.87)	<0.001
Retained placenta	BMI <24.9	386	(0.13)	1.00 (ref)	
	BMI 25.0–29.9	253	(0.15)	1.03(0.88,1.21)	0.699
	BMI >30.0	148	(0.12)	0.84(0.69,1.02)	0.078
Uterine Atony	BMI <24.9	786	(0.27)	1.00 (ref)	
	BMI 25.0–29.9	526	(0.30)	1.04(0.93,1.16)	0.501
	BMI >30.0	451	(0.37)	1.18(1.05,1.33)	0.007

RESULTS

Table II. Association between fetal complications and BMI

Outcome	BMI Group	n	%	Multiple logistic regression	
				Adj OR (95% CI)	p-value
Induction of labour	BMI <24.9	68,950	(23.49)	1.00 (ref.)	
	BMI 25.0–29.9	41,049	(23.54)	1.01(1.00,1.03)	0.134
	BMI >30.0	29,821	(24.73)	1.04(1.02,1.06)	<0.001
Breech delivery	BMI <24.9	674	(0.23)	1.00 (ref.)	
	BMI 25.0–29.9	315	(0.18)	0.74(0.65,0.85)	<0.001
	BMI >30.0	176	(0.15)	0.59(0.50,0.70)	<0.001
SVD	BMI <24.9	221,637	(75.50)	1.00 (ref.)	
	BMI 25.0–29.9	121,462	(69.64)	0.72(0.71,0.73)	<0.001
	BMI >30.0	72,184	(59.86)	0.48(0.47,0.48)	<0.001
Instrumental Del	BMI <24.9	13,183	(4.49)	1.00(ref.)	
	BMI 25.0–29.9	6,511	(3.73)	0.97(0.94,1.01)	0.101
	BMI >30.0	3,586	(2.97)	0.82(0.79,0.85)	<0.001
Emergency CS	BMI <24.9	45,546	(15.51)	1.00(ref.)	
	BMI 25.0–29.9	34,555	(19.81)	1.39(1.37,1.41)	<0.001
	BMI >30.0	32,343	(26.82)	2.01(1.97,2.04)	<0.001
Elective CS	BMI <24.9	11,682	(3.98)	1.00(ref.)	
	BMI 25.0–29.9	11,092	(6.36)	1.48(1.44,1.52)	<0.001
	BMI >30.0	11,972	(9.93)	2.31(2.25,2.38)	<0.001
Primary PPH	BMI <24.9	1,489	(0.51)	1.00(ref.)	
	BMI 25.0–29.9	1,017	(0.58)	1.06(0.98,1.15)	0.129
	BMI >30.0	867	(0.72)	1.21(1.11,1.32)	<0.001
Preterm delivery	BMI <24.9	31,283	(10.66)	1.00(ref.)	
	BMI 25.0–29.9	16,912	(9.70)	0.89(0.87,0.90)	<0.001
	BMI >30.0	12,460	(10.33)	0.89(0.87,0.91)	<0.001
SGA	BMI <24.9	71,854	(24.48)	1.00(ref.)	
	BMI 25.0–29.9	31,399	(18.00)	0.72(0.71,0.73)	<0.001
	BMI >30.0	18,096	(15.01)	0.58(0.57,0.59)	<0.001
Low birth weight	BMI <24.9	50,167	(17.09)	1.00(ref.)	
	BMI 25.0–29.9	21,348	(12.24)	0.69(0.68,0.71)	<0.001
	BMI >30.0	13,511	(11.21)	0.59(0.58,0.61)	<0.001
Macrosomia	BMI <24.9	3,799	(1.29)	1.00(ref.)	
	BMI 25.0–29.9	5,627	(3.23)	2.31(2.21,2.41)	<0.001
	BMI >30.0	7,954	(6.60)	4.70(4.52,4.90)	<0.001
Shoulder dystocia	BMI <24.9	347	(0.12)	1.00(ref.)	
	BMI 25.0–29.9	442	(0.25)	1.86(1.61,2.14)	<0.001
	BMI >30.0	387	(0.32)	2.16(1.86,2.51)	<0.001

CONCLUSION

Pre pregnancy counselling should be an integral part of care for women in reproductive health.

Nutritional counselling for establishment of a healthy and balanced diet is important. Physical exercise and close monitoring of weight preconceptionally is important in women planning pregnancy with an elevated body mass index to reduce maternal and fetal complications. To improve outcomes, measures must be taken to promote healthy weight prior to pregnancy.

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Contact Information

Dr Shamala Devi Karalasingam

Address: Tel: +60133365957
shamaladevi@crc.gov.my