

Original article:

Overweight and obesity in pregnancy and its outcome

¹ Dr.Pillai Arthi Karunanithi, ²Dr.A.K.Chitra*

¹ Assistant Professor, Dept.of OBG, Dhanalakshmi Srinivasan Medical College and Hospital, Perambalur

² Assistant Professor, Dept.of OBG, Dhanalakshmi Srinivasan Medical College and Hospital, Perambalur

Corresponding author *

Abstract:

In general, pregnancy in women is considered unique, physiologically normal episode in women's life. However preexisting morbidity of the mother or fetus can complicate pregnancy as well as those arising during pregnancy and intrapartum making it a high risk one. "A pregnancy is defined as high risk, when the probability of an adverse outcome for the mother or child is increased over the base line risk of that outcome among the general population by the presence of one or more ascertainable risk factors".¹The magnitude of the obesity prevalence has been increasing in developed and developing nations, though in varying degrees. Also coming with the increase in obesity prevalence, inevitably, are the morbidities obesity promotes, including cardiovascular disease, diabetes, hypertension, stroke etc. It becomes a major issue when it affects the women of reproductive age group, as obesity makes a pregnancy high risk, by the increased incidence of gestational diabetes, preeclampsia, gestational hypertension, labour induction, increased cesarean rates, anaesthetic complications, postoperative morbidity, prolonged hospital stay etc.They are at increased risk of delivering large babies and NICU admission.

INTRODUCTION

In general, pregnancy in women is considered unique, physiologically normal episode in women's life. However preexisting morbidity of the mother or fetus can complicate pregnancy as well as those arising during pregnancy and intrapartum making it a high risk one. "A pregnancy is defined as high risk, when the probability of an adverse outcome for the mother or child is increased over the base line risk of that outcome among the general population by the presence of one or more ascertainable risk factors".¹The magnitude of the obesity prevalence has been increasing in developed and developing nations, though in varying degrees. Also coming with the increase in obesity prevalence, inevitably, are the morbidities obesity promotes, including cardiovascular

disease, diabetes, hypertension, stroke etc. It becomes a major issue when it affects the women of reproductive age group, as obesity makes a pregnancy high risk, by the increased incidence of gestational diabetes, preeclampsia, gestational hypertension, labour induction, increased cesarean rates, anaesthetic complications, postoperative morbidity, prolonged hospital stay etc.They are at increased risk of delivering large babies and NICU admission.

MATERIALS AND METHODS

Pregnant women attending antenatal outpatient department, at Dhanalakshmi Srinivasan Medical College and Hospital were enrolled in our study. Women with prepregnancy BMI 25-29.99 were classified as overweight and BMI >30 as obese. Similar number of normal BMI 18-24.9 were taken as control.

Pregnancy outcome analysis included preeclampsia, gestational diabetes mellitus, urinary tract infection, preterm labour and postdatism. subsequently need for induction and incidence of operative delivery were recorded. Information collected regarding birth weight, APGAR Score at 5 minutes, gestational age at birth need for admission at neonatal intensive care unit.

Inclusion Criteria:

1. All Pregnant women with early booking
2. No history of previous medical illness.

Exclusion Criteria:

1. Mothers not booked at First Trimester
2. Miscarriage
3. Essential hypertension
4. Overt diabetes mellitus

Study Design : Prospective Randomized comparative Study

Period of Study: February 2015- June 2016

Method of Study : Pregnant mothers were selected according to the criteria and in all women detailed history followed by complete general and physical examination was done. Relevant hematological, biochemical investigations, USG were done. They were followed up to delivery and postpartum until discharge and outcome studied.

History : In these women relevant history such as age, parity, socioeconomic status, menstrual history, infertility, hypertension, diabetes, hypothyroidism, or other medical illnesses. History of previous pregnancy outcome was obtained in detail. Family history of obesity, hypertension and diabetes, were enquired.

Physical Examination : Detailed physical examination with regards to weight gain, pulse, BP were recorded. They were examined for anaemia, pedal edema and systemic examination of Cardiovascular System, Respiratory System and Central Nervous System was done.

Lab investigation :

Relevant investigations were done in each case.

Follow-up of Cases :

With above information, the antenatal mothers were followed up during antenatal period, delivery and postpartum until discharge. They were looked for the development of,

Statistical Analysis

Differences between groups were charted using chi-square and student t test and statistical significance was deemed at a P value of < 0.05 and likelihood ratio was calculated.

OBSERVATION AND RESULTS

Fifty pregnant women with BMI 18.5-24.9 (Group A-Control) and fifty pregnant women with BMI 25-29.9(Group B-Overweight) and fifty pregnant women with BMI >30kg/m² (Group C –Obese) were selected and were followed prospectively.

TABLE:5.1MATERNAL AGE DISTRIBUTION

AGE	CONTROL		OVERWEIGHT		OBESITY	
	No	percentage	No	percentage	No	Percentage
<20	2	4%	1	2%	-	-
20-24	19	38%	14	28%	15	30%
25-29	26	52%	25	50%	25	50%
>30	3	6%	10	20%	10	20%

TABLE: 5.2 PARITY

Parity	CONTROL		OVERWEIGHT		OBESITY	
	No	percentage	No	percentage	No	percentage
NULLI	34	68	26	52	19	24
PARA1	15	30	20	40	24	48
PARA2	1	2	4	8	7	14

Pearson Chi-square =10.846, P=0.028 (significant)

Among obese women 24% were nulliparous and 62% were parous women, in overweight group 52% were nulliparous and 48% were parous women where as in control group 68% were nulliparous and 32% were parous women.

TABLE:5.3ANTEPARTUMOBSTETRIC COMPLICATION

OBS. COMPLICATION	CONTROL		OVERWEIGHT		OBESITY		Test of significance	LIKELIHOOD RATIO
	No	%	No	%	No	%		
PRE ECLAMPSIA	3	6	6	12	13	26	P=0.015	8.37
GDM	2	4	9	18	13	26	P=0.010	10.6
UTI	1	2	2	4	2	4	P=0.813	0.451
PRE TERM LABOUR	1	2	1	2	2	4	P=0.773	0.485
POST DATISIM	2	4	3	6	3	6	P=0.876	0.277

The incidence of preeclampsia was 26% in obese group and 12% in overweight and 6% in control group. The incidence of GDM was 26% in obese group, 18% in overweight and 4% in control group which was statistically significant. Incidence of UTI was 2% in control group, 4% in overweight and obese group. Incidence of preterm labour was 2% in control and overweight and 4% in obese group which was not statistically significant. (p>0.05)

TABLE: 5.4 INDUCTION OF LABOUR

INDUCTION	CONTROL		OVERWEIGHT		OBESE	
	No	%	No	%	No	%
YES	2	4	3	6	10	20
NO	48	96	47	94	40	80

Chi-square=8.444, P=0.015

The labour induction rates were 20% in obese group, 6% in overweight group and 4% in control group. Obese and overweight group had higher induction rate which was statistically significant.

TABLE: 5.5 MODE OF DELIVERY

MODE OF DELIVERY	CONTROL		OVERWEIGHT		OBESITY	
	No	%	No	%	No	%
NORMAL DELIVERY	35	70	27	54	19	38
INSTRUMENTAL DELIVERY	1	2	2	4	4	8
LSCS	14	28	21	42	27	54

Chi -square=10.838 p=0.028, Significant

Normal delivery rates were 38% in obese group, 54% in overweight group compared to 70% in control group. Incidence of lscs was 54% in obese group 42% in overweight group and 28% in control group which was statistically significant. The rate of instrumental delivery was 2% in control 4% in overweight and 8% in obese group

TABLE: 5.6 INDICATIONS OF LSCS

INDICATION	CONTROL		OVERWEIGHT		OBESE	
	No	%	No	%	No	%
	1	7.1	2	9.5	12	44.4
FAILURE TO PROGRESS	2	14.3	2	9.5	3	11.1
FETAL DISTRESS	7	50	5	23.8	3	11.1
FAILED INDUCTION	1	7.1	2	9.5	7	25.9
MALPRESENTATION	1	7.1	4	19	1	3.7
REPEAT LSCS	2	14.3	6	28.6	1	3.7

Rate of CPD and failed induction were significantly higher in obese individuals 44.4% and 25.9% respectively compared control and overweight. (p=0.005).

POSTNATAL

TABLE: 5.7 BIRTH WEIGHT

BIRTH WEIGHT	CONTROL		OVERWEIGHT		OBESE	
	No	%	No.	%	No	%
1.5-1.9	1	2	-		1	2
2-2.49	1	2	4	8	1	2
2.5-2.9	26	52	16	32	14	28
3-3.49	18	36	25	50	25	50
3.5-3.9	4	8	5	10	9	18

P=0.142

Majority of women in overweight and obese group 50% each were between 3-3.49 kg and in control group (52%) between 2.5-2.9 kg. 18% obese women had babies weighing 3.5-3.9 kg compared to 10% in overweight and 8% in control group.

TABLE: 5.8 APGAR AT 5 MIN

APGAR AT 5 MIN.	CONTROL		OVERWEIGHT		OBESE	
	No	%	No	%	No	%
<7	1	2	2	4	1	2
≥7	49	98	48	96	49	98

TABLE: 5.9 NICU ADMISSION

NICU ADMISSION	CONTROL		OVERWEIGHT		OBESE	
	No	%	No	%	No	%
NO:	4	8	6	12	10	20

DISCUSSION

In our study, women in the obese and overweight group were slightly older when compared to women with normal BMI. The mean maternal age in obese group was 26.74. And overweight group was 26.44 and control group was 25.08. Obese and overweight women were less likely to be nulliparous. This is in accordance with the results of Ehrenberg HM et al⁴ that, increasing age and parity are risk factors for obesity. In obese group, we found increased risk of pre-eclampsia (26%). The frequency was almost 4.3 times as high for obese group as it was for group with normal BMI. In overweight individuals risk of pre eclampsia was (2.1) times more than normal BMI . Obese group exhibited a higher risk of developing gestational diabetes (26%) when compared to normal BMI group (4%). There was 6.5 fold risk increase for gestational

diabetes among obese women. Overweight individuals had (18%) risk compared to normal individuals. Our study results were consistent with several studies Gross et al⁵ Ehren berg et al⁴ Gladly et al⁶ Roman et al⁷

There was increased incidence of UTI 4% in both over weight and obese individuals compared to 2% in normal BMI individuals. The incidence of preterm labour was 4% in obese and 2.% in overweight compared to 2% in normal BMI patients . Postdatism was 6% in both obese and over weight group and 4% in normal group. We observed that labour induction was more common in obese group(20%) and in overweight group (6%) when compared to control group(4%), which is in accordance with other studies, (Ekblad U et al⁸). In the obese group, our results supported a number of previous studies (JoshuaL-Weiss et al⁹ and Marie -I -

Cedergren et al¹⁰) that have demonstrated an increased risk for cesarean delivery in this group. The cesarean delivery rates were 54 % in obese group and 42% in overweight 28% in control group. Obese women had 1.9 fold increased risk of cesarean delivery when compared to control group. Instrumental deliveries were increased in obese group, 8% over weight 4% compared to 2% in normal group which is in accordance to other studies (Joshua. L. Weiss et al⁹, Marie. I Cedergren¹⁰.)

Neonates of obese mothers had increased NICU admission, the major reasons for admission being infants of diabetic mothers and macrosomia. There was no difference in Apgar score at 5 min between the two groups. This is consistent with study done by Line Rode et al¹³.

CONCLUSION

Our study points out the maternal and perinatal risks in obese and overweight pregnant women such as increased incidence of pre eclampsia, gestational diabetes, UTI, preterm labour, post datism, induction of labour, instrumental delivery , cesarean section, birth weight 3.5-3.9 kg and NICU admission which pose a considerable

challenge to the obstetrical practitioner. In addition, massive obesity among women of child bearing age is associated with a number of health risks later in life.

This stresses the importance of concentrating on trying to reduce the increasing incidence of obesity in fertile women. The best time of intervention may be before a women considers a pregnancy, because it is not recommended that obese women lose weight during pregnancy.

This implicates the need of pre-pregnancy advice and counseling to young women. Obese women considering pregnancy should be informed of the risk that maternal obesity confers on a pregnancy. Health care professionals need to encourage and assist obese women to make life style changes, to lose weight preconceptually in an attempt to optimize and potentially decrease the risk of complication in pregnancy. Pregnancies among obese women must be classified as high risk pregnancies and appropriate antenatal care should be provided with heightened surveillance, anticipation and diagnosis of the complications and intervene earlier if complications arise.

BIBLIOGRAPHY

1. High risk Pregnancy: Management options: D.K. James(text book)
2. Park's Text Book of Preventive and Social Medicine(textbook)
3. Williams Obstetrics 23rdEdition(text book)
4. Ehrenberg HM, Dierker L, Milluzzi C, et al, Prevalence of maternal obesity in an urban center. Am J Obstet Gynecol. 2002; 187:1189-1193.
5. Gross T, Sokol RJ, King KC. Obesity in pregnancy: Risks and outcome.Obstet Gynecol. 1980;56:446-450.
6. Gladys A. Ramos et al.The interrelation between ethnicity and obesity on obstetric outcomes. AM J Obstet Gynecol 193:1089-93, 2005 .

7. H Roman^{I, II, III}; PY Robillard^I; TC Hulsey^{III}; A Laffitte^I; K Kouteich^{II}; L Marpeau^{II}; G Barau^I Obstetrical and neonatal outcomes in obese women West Indian Medical Journal Print ISSN 0043-3144 West Indian med. j. vol.56 no.5 Mona Oct. 2007.
8. Ekblad U, Grenman S. Maternal weight, weight gain during pregnancy and pregnancy outcome. Int J Gynaecol Obstet. 1992 Dec;39(4):277-83.
9. Joshua L. Weiss et al. Obesity, obstetric complications and cesarean delivery rate-a population-based screening study. AM J ObstetGynecol 190:1091-7, 2004
10. Marie I. Cedergren .Maternal morbid obesity and the risk of adverse pregnancy outcome. Vol. 103, No:2, Feb 2004 ObstetGynecol 2004
11. Baeten JM, Bukusi EA, Lambe M. Pregnancy complications and outcomes among overweight and obese nulliparous women. Am J Pub Health. 2001;91:436-440.
12. Sebire NJ, Jolly M, Harris JP, et al. Maternal obesity and pregnancy outcome a study of 287, 213 pregnancies in London. Int J. ObesRelatMetab Dis. 2001;25:1175-1182.
13. Rode L, Nilas L, Wøjdemann K, Tabor A. Obesity-related complications in Danish single cephalic term pregnancies. Obstet Gynecol. 2005 Mar;105(3):537-42.