Original Article

Effect of Lifestyle Intervention on Mode of Delivery in Overweight Pregnant Women

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Abstract

Objective: To determine the effect of lifestyle interventions on mode of delivery in overweight pregnant women.

Methodology: This descriptive case series study was performed at the Department of Obstetrics and Gynaecology, Jinnah Postgraduate Medical Center, Karachi from July 2019 to December 2019. A total of 145 women with singleton fetus having BMI of 25.0-29.9 were included. At every antenatal visit, a 30 minutes group session with a dietician was done. A lifestyle brochure was given. On every antenatal visit, compliance was checked. Final outcome was measured at 42 weeks of gestation. Data was collected via study proforma and analysis was done by using SPSS version 20.

Results: Mean age of participants was 29.32±2.68 years. Mean BMI was 27.33±1.36 Kg/m2. Most (64.8%) patients complied with the lifestyle intervention. Out of all (68.3%) cases underwent vaginal deliveries and 31.7% of patients underwent Cesarean sections. Among vaginal deliveries 85.9% were spontaneous. A significant association of mode of delivery was observed with compliance (p=0.011).

Conclusion: Lifestyle intervention can improve dietary habits and physical activities during pregnancy among obese females and reduce the risk of increasing rate of Cesarean section.

Keywords: Lifestyle Interventions, Mode of Delivery, Overweight (BMI 25.0-29.9) Pregnant Women.

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Introduction

Obesity, being the 6th most significant risk factor, contributes to the overall disease burden globally. Almost 35% of Australian pregnant females and 30% of the Belgian females who have been seeking antenatal services have BMI >26 kg/m.[1,2] However according to the local study, the incidence of obesity and overweight generally in Pakistani population is 25.0%.[2]

Maternal obesity remains a significant risk factor for fetomaternal complications, like gestational diabetes mellitus (GDM),[3] pregnancy induced hypertensive disorders,[4] higher rate of Cesarean sections,[5] macrosomia, preterm births and maternal and fetal mortality.[6] A study done in Pakistan reveals approximately 7 times higher risk of induced labour in obese women.[7]

As per the Preventive Medicine Institute, it is recommended that during pregnancy females of average weight (BMI 18.5 to 24.9) should gain 11.4 to 15.9 kg of weight, while overweight females (BMI 25.0 to 29.9) should gain 6.8 to 11.3 kg of weight.[8] Addressing pregnant females has become the subject of nutritional and lifestyle initiatives, since 33% of pregnant females appear to become overweight during pregnancy. Food intake and physical exercise measures during pregnancy are successful in minimizing weight gain among pregnant females during pregnancy.[9] Lifestyle

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interventions improve the nutritional habits of overweight women during pregnancy.[10] Mild physical exercise has lately been suggested for pregnant females who are not contraindicated to exercise.[11]

In a clinical trials' systematic review involving 13 studies, it was observed that dietary recommendation seems valuable in reducing the overall gain of gestational weight [12] and continuing postnatal weight retention, though evidence regarding additional benefits on maternal and newborn's health was limited. A retrospective study done for 8 years period in UK demonstrates a raised risk of negative outcomes in overweight pregnant women.[13]

According to a case-control intervention study done in Sweden in 2007 the percentages of instrumental delivery in the intervention group is 10%, the acute Caesarean section is 14.3% and of elective Caesarean section is 9.7%.[14]

Overweight pregnancy mostly causes a good size baby resulting in a Caesarean section. NICE guidelines about lifestyle interventions have been formulated to overcome such complications but in such poor resource countries, no study so far has been carried out using NICE guidelines, therefore the current study is designed to assess the role of lifestyle interventions in reducing Caesarean section incidence and bed occupancy rates.

Methodology

This descriptive case series study was done at the Obstetrics and Gynaecology department, of Jinnah Postgraduate Medical Center, Karachi. Study was conducted from July 2019 to December 2019. The selection of patients was done by non- probability sampling technique after taking consent and approval from the Institutional Review Board. Patients' selection was based on the following inclusion criteria: age range of 25-35, BMI of 25-29.9 kg/m2, multigravida or Primigravida with singleton pregnancy without congenital anomalies, and gestational age of up to 20 weeks. Patients excluded from the study were those with medical disorders, a preexisting problem like antepartum hemorrhage, and those who were scheduled for cesarean section or with preterm deliveries. Women were followed monthly until 32 weeks and fortnightly to 42 weeks.

A dietician and a nurse were involved. At every antenatal visit, a 30 minutes group session with a dietician was done. A brochure written in Urdu with pictorial representation, mentioning nutritional advice and physical activity was given at first visit (both English and Urdu version). On every antenatal visit, compliance was checked. Adherence to the advice for more than or equal to 80 percent assessed on history was taken as being compliant.

Weight was measured wearing indoor clothes without shoes on ZT-120 health scale at 20 weeks of gestation on presentation and monthly till 36 weeks. The height of the subject was measured with bare feet on a studio meter. History was taken regarding age, parity, educational status, economical status and rural or urban background. Data was recorded on a predesigned proforma. Women were followed till delivery to see the mode of delivery.

Data analysis was done by SPSS version 20. Frequency and percentage were calculated for categorical variables. Mean and Standard deviation were computed for numerical variables. Effect modifiers like age, BMI, parity, gestational age, educational status, family monthly income, rural or urban and compliance were controlled through stratification. Post stratification chi square test was applied and P values ≤0.05 were taken as significant.

Results

A total of 145 women were involved in this study for determining the role of lifestyle interventions to decrease the C-section. The mean age of study subjects was 29.32±2.68 years and the mean gestational age was 13.39±3.30 weeks. The mean of parity was 2.52±1.09. Table-I.

The BMI was calculated with the help of weight and height. The results showed that the mean BMI was 27.33±1.36 Kg/m2. Out of all 29.7% patients belonged to rural areas and the rest of the 70.3% patients belonged to urban areas. According to the monthly income, 23.4% patients answered that their monthly

Table I: Descriptive Statistics (n=145)

Age (years)	Gestational age (weeks)	Parity	Weight gain during pregnancy	BMI	
29.32±2.68	13.39±3.30	2.52±1.09	13.39±3.30	27.33±1.36	**Mean ±SD**
28.88 – 29.76	15.22 – 27.44	2.34 – 2.70	12.85 – 13.94	27.11 – 27.55	**95%CI (LB – UB)**
29.00 (3)	19 (3.2)	3.00 (1)	14.00 (4)	27.60 (2.5)	**Median (IQR)**

income <Rs15,000 rupees, 25.5% patients had income of Rs15,000-30,000 rupees and 51.0% patients had monthly income >Rs30,000 rupees. Table-II.

According to the educational status, 10.3% of patients were illiterate, 20.0% had only primary education, 31.7% of patients had education till secondary, and 37.9% of patients had education till matric or above. Table-II.

Table: II Frequency Distribution (n=145)

		frequency (n)	(%)
Living Area	**Rural**	43	29.7%
	Urban	102	70.3%
Educational Status	**Illiterate**	15	10.3%
	Primary	29	20.0%
	Secondary	46	31.7%
	Matric and Above	55	37.9%
Socio Economic Status (monthly earnings in Rupees)	**< 15,000**	34	23.4%
	15,000 – 30,000	37	25.5%
	> 30,000	74	51.0%
Compliance	**Yes**	94	64.8%
	No	51	35.2%

The outcome in terms of mode of delivery was evaluated. Most of the patients 68.3% were delivered by normal vaginal deliveries and 31.7% underwent cesarean sections. However, from NVD 85.9% were spontaneously delivered and 14.1% by instrumental. Figure I.

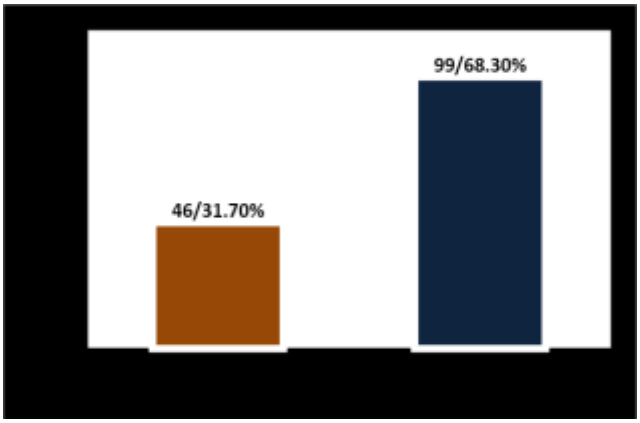

Figure 1. Mode of delivery (n=145)

There was no statistical significance in outcome according to age, parity, gestational age, BMI, living area, educational status, and socio economic status P-values were quite insignificant. However, there was a significant association of mode of delivery with compliance (p=0.011). Table III.

Discussion

Elevated maternal weight or unnecessary weight gain during pregnancy is correlated with negative pregnancy outcomes.[15] In the case of the offspring, obesity of the mother is a significant risk factor of childhood obesity, that continues to adulthood irrespective of other factors. In this study, the mean age of study subjects was 29.32±2.68 years and the mean gestational age was 13.39±3.30 weeks. The mean of parity was 2.52±1.09. The mean BMI was 27.33±1.36 Kg/m^2. Similarly, a study

Table III: Frequency and association of Mode of Delivery

		Vaginal (n=99)	**Caesarean** (n=46)	**Total**	**P-Value**
Age	< 30 years (n=79)	53	26	79	0.737**
	≥ 30 years (n=66)	46	20	66	
Parity	≤ 2 (n=71)	49	22	71	0.852**
	> 2 (n=74)	50	24	74	
Gestational age	≤ 12 weeks (n=57)	40	17	57	0.692**
	> 12 weeks (n=88)	59	29	88	
BMI	≤ 28 Kg/m2 (n=94)	69	25	94	0.072**
	> 28 Kg/m2 (n=51)	30	21	51	
Living area	Rural (n=43)	26	17	43	0.189**
	Urban (n=102)	73	29	102	
Educational status	Illiterate (n=15)	11	4	15	0.115**
	Primary (n=29)	21	8	29	
	Secondary (n=46)	25	21	46	
	Matric and Above (n=55)	42	13	55	
Socio economic status	< 15,000 (n=34)	18	16	34	0.082**
	15,000-30,000 (n=37)	28	9	37	
	> 30,000 (n=74)	53	21	74	
Compliance	Yes (n=94)	71	23	94	0.011*
	No (n=51)	28	23	51	

conducted by Praveen M et al[16] reported that the mean ages of these study cases were 30.47±4.18 years. Mean parity of these study cases was 3.31±1.15. The mean BMI values of these study cases were 29.97±2.91 Kg/m^2. Another study conducted by Fatima S et al[17] reported that the mean age of patients was 26.4 years.

In this study, most of the patients 68.3% were delivered by normal vaginal deliveries and 31.7% underwent cesarean sections. Similarly, K Sinha and Sujeet Pandey[18] reported that the non progress of labour is a more common complication faced by pregnant ladies with obesity followed by cephalo-pelvic disproportion which are major causes of increasing cesarean section rate in obese women. maternal complications increase with an increase in BMI. Frequency of cesarean section significantly raised in obese women as they found that the average of BMI was 31.47kg/m² in cases those were by delivered by spontaneous vaginal delivery, 31.66kg/m2 was in patients those having instrumental delivery and mean BMI was 32.33 kg/m² in patients those underwent cesarean section (p <0.001). Another study conducted by Thangaratinam et al[19] reported that dietary and lifestyle interventions during gestation can decrease the gestational weight gain and improve the feto-maternal outcome. Among the interventions, those based on diet are the most effective and are associated with reductions in maternal gestational weight gain and improved obstetric outcomes. However, Choudhry et al[20] reported that the women having obesity were at high risk of antepartum, intrapartum, and postpartum

complications including an elevated risk of cesarean section. Zhang et al reported[21] stated that the reduction in contractility of the obese uterus in vitro and suggested that this may be due to increased cholesterol deposits in the myometrium.

However, Buhimschi et al[22] mentioned that in the second stage of labour there was no difference in the intrauterine pressure in obese and non-obese patients. Whatever the cause, there appears to be little doubt concerning the link between obesity and cesarean section rate.

Diet and physical activity measures during pregnancy are successful in decreasing weight gain during gestation without negative effects on babies small for gestational age. In comparison to mixed approach and physical activities, dietary changes were correlated with a significant decline in weight gain during pregnancy.[19] In contrast to control, there had been a general trend towards reducing preterm birth, gestational hypertension, gestational diabetes, and intrauterine deaths with intervention. The risk of gestational hypertension, gestational diabetes, pre-eclampsia and preterm births was substantially decreased by diet in comparison to any other approach.[19]

One research indicates that diet-based pregnancy treatments would decrease weight gain during gestation nearly up to 4 kg as compared to 0.7 kg with physical exercise and 1.0 kg using a mixed approach. In minimizing complications like gestational hypertension, gestational diabetes, preterm delivery, and pre-eclampsia, dietary approaches were the most successful. The effect of nutritional and lifestyle approaches on the weight of the fetus is among the key concerns for mothers.[19]

For clinical and weight-related outcomes, interventions specifically focused on diet appeared to be more effective.[19] First, in a systematic approach, the overall benefit achieved may be attributed to the vigor with which interventional components are administered. The different components might not have been provided to the same level in "mixed approaches" as in research that rely on diet only. Secondly, due to its relative convenience and presumed comfort in comparison to physical exercise during pregnancy, compliance may have been higher in studies involving diet only interventions than other techniques.[23] Thirdly, key elements of a diet, like protein, could have advantages that may be invisible to other approaches.

Depending on age, BMI, race, parity, socioeconomic status, and risk profile in pregnancy, integration of patient-related data from a specific meta-analysis of patient data are important to determine the differential impact of the advantages identified with approaches in different groups. A specific meta-analysis of patient data will determine whether the increase in clinical results is due to the decrease of gestational weight gain solely or if there's any additional advantage from the intervention type leading to changes in weight. It will moreover enable the extent of gain to be measured for both the baby and mother from weight fluctuations during pregnancy. Factors that may potentially promote or impede adoption are the lack of descriptive data on the severity and length of action means of provision and patient enforcement. Wide prospective trials of good quality are required for the significant clinical findings found, including long-term fetomaternal effects.[19] Overweight or obese has a significant adverse impact on the mode of delivery, with risk increasing across BMI

categories. These risks have obvious implications for the management of these women during their pregnancy and labour. Lifestyle intervention is effective and safe in the management of mode of delivery among these women.

Conclusion

In conclusion, lifestyle intervention based on a brochure and sessions with dietician can improve dietary and physical activity habits throughout pregnancy in obese women and reduce the risk of cesarean section. Further large sample size studies should be conducted to assess the mechanism which is still controversial.

References

1. Dodd JM, Grivell RM, Crowther CA, Robinson JS. Antenatal interventions for overweight or obese pregnant women: a systematic review of randomized trials. BJOG. 2010;117:1316-26.
2. Jafar TH, Chaturvedi N, Pappas G. Prevalence of overweight and obesity and their association with hypertension and diabetes mellitus in an Indo-Asian population. CMAJ. 2006;175(9):1071-71.
3. Sebire NJ, Jolly M, Harris JP, Wadsworth J, Joffe M, Beard RW, et al. Maternal obesity and pregnancy outcome: a study of 287,213 pregnancies in London. Int J Obes Relat Metab Disord. 2001;25(8):1175-1182.
4. Asim SS, Naeem H. Pregnancy with obesity: a risk factor for PIH; J Liaquat Uni Med Health Sci. Sep-Dec 2010;09:125-129.
5. Fatima S, Rehman A, Gangat SA, Kamal A, Ahmad Z. To compare maternal and fetal outcome in obese verses non-obese laboring mothers. J Uni Med Dent Coun.2011;2:28-32.
6. Kristensen J, Vestergaard M, Wisborg K, Kesmodel U, Secher NJ. Pre-pregnancy weight and the risk of stillbirth and neonatal death. BJOG. 2005;112:403-408.
7. Shabab U, Tahir S. Effect of obesity on cesarean section rate. J Surg Pak.2010;15(2):92-96.
8. Weight gain during pregnancy. Comimttee opinion no 548. American College of obstetrician and gynaecologists. Obstet Gynecol 2013;121:210-212.
9. Thangaratinam S, Rogozinska E, Jolly K, Glinkowski S, Duda W, Borowiack E, *et al*. Interventions to reduce or prevent obesity in pregnant women: a systematic review. Health Technol Assess 2012;16(31)3-4.
10. Guelinckx I, Devlieger R, Mullie P, Vansant G. Effect of lifestyle intervention on dietary habits, physical activity, and gestational weight gain in obese pregnant women: a randomized controlled trial. Am J Clin Nutr 2010;9:373-80.
11. Nascimento S, Surita F, Parpinelli M, Siani S, Pinto e Silva J. The effect of an antenatal physical exercise programme on maternal/perinatal outcomes and quality of life in overweight and obese pregnant women: a randomised clinical trial. BJOG 2011;118:1455–1463.
12. Dodd JM, Cramp C, Sui Z, Yelland LN, Deussen AR, Grivell RM, et al. The effects of antenatal dietary and lifestyle advice for women who are overweight or obese on maternal diet and physical activity: the limit randomised trial. BMC Medicine 2014;12:161.
13. Pillai RS, Spence D, Cardwell CR, Hunter A, Holmes VA. The impact of body mass index on maternal and neonatal outcomes: a retrospective study in a UK obstetric population, 2004-2011. BJOG 2013;120:932-939.
14. Deierlein A, Siega-Riz AM, Adair LS, Herring AH. Effects or prepregnancy body mass index and gestational weight gain on infant anthropometric outcomes. J Ped 2011;158: 221–6.
15. Ramachendran J, Bradford J, McLean J. Maternal obesity and pregnancy complications: a review. Aust N Z J Obstet Gynaecol 2008;48:228-245.
16. Parveen M, Ismaile M, Masood R. Obesity as a Predictor of Adverse Maternal Outcomes among Pregnant Women of a rural community. PAKISTAN JOURNAL OF MEDICAL & HEALTH SCIENCES. 2017 Jul 1;11(3):938-941.
17. Fatima S, Rehman A, Gangat SA, Kamal A, Ahmad Z. To compare maternal and fetal outcome in obese verses non-obese laboring mothers. J Uni Med Dent Coll. 2011;2(2):28-32.
18. K Sinha, Sujeet Pandey, C R Das. Impact of Maternal Obesity on Pregnancy Outcome.2018.Journal of Nepalgunj Medical College 14(2):18.
19. Thangaratinam S, Rogozińska E, Jolly K, Glinkowski S, Roseboom T, Tomlinson JW, Kunz R, Mol BW, Coomarasamy A, Khan KS. Effects of interventions in pregnancy on maternal weight and obstetric outcomes: meta-analysis of randomised evidence. Bmj. 2012; 344:e2088.
20. Choudhry H, Choudhry A, Azam N, Jan S. Effects of Obesity on Pregnancy and its outcome. Pakistan Armed Forces Medical Journal. 2009 ;59(3):315-319.
21. Zhang J, Bricker L, Wray S, Quenby S. Poor uterine contractility in obese women women Br J Obstet Gynaecol 2007;114:343-348.
22. Buhimschi CS, Buhimschi IA, Malinow AM, Weiner CP. Intrauterine pressure during the second stage of labor in obese women. Obstetrics & Gynecology. 2004;103(2):225-230.
23. Yazdy MM, Liu S, Mitchell AA, Werler MM. Maternal dietary glycemic intake and the risk of neural tube defects. Am J Epidemiol 2010;171:407-414.