

Is Obesity a Risk factor for Postpartum Hemorrhage?

Hiba J. Jawher¹, Methal A. Alrubae², Ahlam S. Desher³

^{1,2,3} University of Basra/College of medicine/Department of Obstetrics & Gynecology/Basra/Iraq

Abstract

Background: The incidence of postpartum hemorrhage has been increasing in several developed countries over the past two decades with the rate rising by over one third. This rise with its associated maternal morbidity and mortality is not explained by corresponding change in risk factors such as rise in cesarean section rate and induction of labor. **Objectives:** To confirm whether maternal obesity is associated with an increased risk of postpartum hemorrhage. **Method:** A prospective case-control study of 150 pregnant women hospitalised with spontaneous labour (Dec. 2021-Sept. 2022). (65) suffered postpartum haemorrhage (case group) and (85) did not (control group). Both groups' ages were equalised. Multiple pregnancies, polyhydramnios, prolonged & induced labour, intrauterine mortality, early membrane rupture, chorioamnionitis, placenta previa & abruption, hypertension, diabetes & anaemia were avoided. Visual assessment of blood loss, weighing blood-soaked items, and patient hemodynamic condition are used to diagnose postpartum haemorrhage. Maternal weight height was used to calculate BMI. **Results:** Among case group; (55.4%) were young age (i.e. 18-35y) and were multiparous (63%) compared to (53%, 62.3 %) respectively in the control. The main cause of postpartum hemorrhage was uterine atony (80%). In the case group ;(46%) were overweight, (35%) obese class I and (7.7%) obese class II with no significant difference from the control (48.2 %, 27%, 4.7%) respectively. Cesarean section rate was (26%) compared to (11.7%) in the control with significant difference. **Conclusion:** Obesity seem not to be associated significantly with increased risk of postpartum hemorrhage.

Keywords: Obesity, Risk factor, Postpartum Hemorrhage.

Introduction

Postpartum hemorrhage is defined as blood loss exceeding (500 ml) in vaginal delivery and greater than (1,000 ml) in a cesarean section.⁽¹⁾ It can be primary if it occurs within (24h) post-delivery & secondary if it occurs after (24hours till 6weeks) post-delivery⁽¹⁾. Worldwide the prevalence rate of postpartum hemorrhage is (6%) and Africa has the highest prevalence rate of about (10.5%).⁽²⁾ In Iraq, the prevalence rate was (6%) in Baghdad⁽³⁾ (1.3%) in Erbil⁽⁴⁾. The prevalence of PPH ranged from (2.5%) in Asia to (10.45%) in Africa.⁽⁵⁾ The etiologies of PPH are classically divided into four different categories known as four Ts; Tone, Trauma, Tissue and Thrombin⁽⁶⁾. Risk factors for PPH include prior PPH, abnormal placentation, over distension of uterus, exhausted myometrium, genital tract trauma & coagulation defect⁽⁷⁾. Advanced maternal age, having BMI more than 30, anemia, pre-eclampsia & hypertension are other maternal risk factors for PPH.⁽⁸⁾ WHO define obesity as (abnormal or excessive fat accumulation that may impair health).⁽⁹⁾ BMI is a simple index of weight for height that is commonly used to classify overweight & obesity. It is defined as (person's weight in kg divided by the square of height in meter (kg/m²)).⁽⁹⁾ Worldwide; among adults, the prevalence of obesity (BMI \geq 30 kg/m²) is (14.9%) in women.⁽¹⁰⁾ The proportion of pregnant women with obesity has doubled over the past decade from around (22%) in 2010 to (44%) in 2018⁽¹¹⁾. Antepartum complications of pregnancy associated

with obesity are congenital anomalies of the fetus, macrosomia, gestational hypertension, pre-eclampsia, gestational D.M, still birth, spontaneous α recurrent abortions⁽¹²⁾. Intrapartum complications of obesity include increased rate of C/S, failed induction of labor, failed trial of labor after C/S, operative complications during C/S α shoulder dystocia while postpartum complications include hemorrhage, wound infection & thrombo-embolism⁽¹²⁾. The aim of study is to confirm whether maternal obesity is associated with an increased risk of postpartum hemorrhage.

Method

A prospective case control study had been carried out at AL - Basra Maternity α Child Hospital from (1st of Dec. 2021) till (1st of sept 2022). It included (150) gravid women with spontaneous labor admitted to the labor ward. Such women were subdivided into (65) as case group who had postpartum hemorrhage and (85) as control group who had no postpartum hemorrhage. Age α parity were adjusted for both groups. Cases of Multiple pregnancy, polyhydramnios, prolong & induced labor, intra uterine death, Premature rupture of membrane & chorioamnionitis, placental complications as Previa α abruption, medical disease as hypertension, Diabetes mellitus α anemia were excluded. The diagnosis of postpartum hemorrhage based on visual estimation of blood loss, the volume of blood loss is measured by weighing all blood soaked material & clots to determine cumulative volume. The

equation used to calculate the blood loss is
 Wet Item Gram Weight- Dry Item Gram Weight =
 Milliliters of blood within the item. One gram== one ml **blood loss**⁽¹³⁾

Also the hemodynamic status of the patient was evaluated by monitoring the vital signs. Maternal weight & height were measured after delivery to estimate BMI by the equation: **BMI = B.W in Kg/height in meter²**

BMI is classified as: - Underweight== less than 18.5.
 Normal== 18.5-24.9.

Over weight=== 25-29.9.

Obese class1== 30-34.9.

Obese class 11== 35-39.9.

Obese class 111=== equal or more than 40⁽¹⁴⁾

A special questionnaire printed formula was arranged for each participant to collect data about age, parity, cause of PPH & mode of delivery.

Statistical analysis:

To test the significance of difference; P - value was estimated using chi square test & fisher exact test.

Results

Demographic distribution revealed that the majority of both the case & control group were of young age group (i.e. 18-35 years) ;(**55.4%, 52.9%**) respectively. Similarly, the majority of both groups were multiparous with (1-4) deliveries (**63.1%, 62.4%**) respectively with no significant difference.

Table 1: Demographic distribution of the study women

Demographic distribution	Case group		Control group		P-Value	
	No.	%	No.	%		
1. Age	< 18 years	2	3.1	10	11.8	X²=3.89 P=0.143
	18-35 years	36	55.4	45	52.9	
	>35 years	27	41.5	30	35.3	
	Total	65	100%	85	100%	
2. Parity	Prim gravida	10	%15.4	19	22.4%	X²=1.37 P=0.422
	1-4 deliveries	41	%63.1	53	62.4%	
	5- > deliveries	14	%21.5	13	15.2%	
	Total	65	100%	85	100%	

P > 0.05= Not significant P < 0.05= Significant
 The main cause of PPH was uterine atony (**80%**) while

cervical tear was responsible for PPH in (**16.9%**) of the case group.

Table 2: Causes of PPH.

Causes	No.	%
1. Uterine atony	52	80%
2. Genital tract trauma		
a. Vulvar & perianal tear		
b. Cervical tear	11	16.9%
c. Rupture uterus	2	3.1%
3. Placenta complications		
a. placenta previa		
b. Abruptio		
c. Retained placenta		

According to BMI; (**10.7%**) of the case group had normal weight compared to (**18.8%**) in the control, while the majority of both the case & control group had overweight by BMI measurement; (**46.2% Vx 48.2%**) and about (**43%**) of the case group were obese as their BMI was (> 30) compared to (**33%**) in the control with no significant difference.

Table 3: Comparison between the cases & control groups according to BMI

BMI	Case		Control		P-Value
	No.	%	No.	%	
Normal weight	7	10.7	16	18.8	X²=2.99 P=0.559
Over weight	30	46.2	41	48.2	
Class I obesity	23	35.4	23	27.1	
Class II obesity	5	7.7	4	4.7	
Class III obesity	0	0	1	1.2	
Total	65	100	85	100	

The rate of cesarean section among those who had PPH was (**26.2%**) compared to (**11.8%**) in the control while (**88.2%**) of the control group had normal

vaginal delivery compared to about (**74%**) in the case group with significant difference.

Table 4: Mode of delivery.

Mode of delivery	Case		Control		P-Value
	No.	%	No.	%	
1. NVD	48	73.8	75	88.2	X²=5.16 P=0.023
2. C/S	17	26.2	10	11.2	
Total	65	100%	85	100%	

Discussion

Obesity has been declared by the World Health Organization as a pandemic nutritional disorder which is rapidly growing threat to the health of population of an increasing number of countries worldwide⁽¹⁵⁾. Unfortunately, there is an unequivocal increased incidence of poor labor outcome for both mother & fetus. Obesity being an independent risk factor for postpartum hemorrhage⁽¹⁶⁾. More than half of the case group in this study were of young age (55.4%) with no significant difference from the

control (53%); this is in agreement with the multivariate analysis indicated that aging was actually associated with decrease risk of PPH; the risk was progressively decrease from those aged (20-29y) to those aged (> 40y) ⁽¹⁷⁾ and unlike the results that PPH occurred in (33.3%) of those > 35 years compared to (15.6%) in those <35 years ⁽¹⁸⁾. Women of the case group were mainly multiparous (63%), the same was true for the control group (62%) with no significant difference as both groups were adjusted together. This finding was against the result of other study which reported that grandmultiparity predispose to the postpartum hemorrhage which affect (4.8%) of grand multiparous group compared to (1.4%) in multiparous due to uterine atony ⁽¹⁹⁾. This difference can be explained by variation in the size of the sample, duration of the study & the type of population studied. The main cause for PPH in this study was uterine atony (80%); this is similar to the concept concluded by other study as the risk of atonic hemorrhage increased rapidly with increasing BMI, there was twofold increased risk in obese class III women (1.8%) compared to (1.6%) in those with normal weight. There seemed to be no association between postpartum hemorrhage caused by retained placenta and maternal obesity & bleeding attributable to laceration occurred more often among obese women ⁽²⁰⁾. Some basic & clinical studies investigating uterine contractions during labor indicate that obesity can impair uterine tone, so that the reproductive organs may not react as quickly or well to contraction inducing medications. The underlying reason for this are undefined, but disruption of the hormonal balance in obese women may contribute to the impaired uterine response to control bleeding. So they need higher dose of uterotonic agents to work more effectively ⁽²¹⁾. Those who developed PPH in the current study were overweight in 46%, obese class 1, 11(35%, 7.7%) respectively, while only 10.7% were of normal weight; this was unlike the result of other study which stated that among those who developed PPH;(49%) had normal weight, (25.9%) were overweight, 12.7%,5.2% & 3.1% were obese as class1,11,111 respectively ⁽²²⁾. Although the majority of the case group in this study who developed PPH were overweight & obese according to BMI but not significantly different from the control group who tend to have higher BMI as overweight in (48.2) & obese as class 1, 11 & 111(27.1% ,4.7% & 1.2%). This is similar to data from several studies that obesity is reported to have a protective effect ⁽²³⁾ or no association with postpartum hemorrhage ^(24, 25, 26) & unlike the data from other studies which suggest that obese women are at increased risk of PPH or atonic hemorrhage ^(20, 27). The explanation for the higher BMI among both groups in our study can be the tendency of women in our community to approach heavy weight consequent to wrong dietary habit and sedentary life style as well as low educational level and poor knowledge about healthy diet. The rate of cesarean section was significantly higher in the case

group (26%) compared to about (12%) in the control. This was similar to the result of other study (37% vs. 22%) ⁽²⁸⁾. Excessive hemorrhage associated with cesarean section occur in more than (5-10%) of C/S. Common cause are uterine atony, abnormal placentation, uterine trauma & sepsis ⁽²⁹⁾.

Conclusion

Obesity seem not to be associated significantly with increased risk of postpartum hemorrhage.

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