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FREQUENCY OF OBESITY IN PREGNANCY AND ITS OUTCOME ON CESAREAN SECTION RATES

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ABSTRACT

In the past, obesity during pregnancy has been increasingly common globally and presents its share of challenges to maternal and neonatal health. Independent of the delivery route used, having an obese mom increases one's risk of several negative outcomes, such as having a cesarean section (C-section). To optimize obstetric care and reduce adverse outcomes, understanding the relationship between maternal obesity and delivery outcomes is important.

Aim: *The aim of this study is to determine the frequency of obesity in pregnant women, the impact of obesity on cesarean section rates as well as maternal age, age of gestation, parity, gravidity, residence, antenatal care and body mass index (BMI).*

Methods: A prospective cohort study at [Hospital Name] with 75 pregnant women admitted for delivery from January 2022 to December 2023. A sample size was then determined using the World Health Organization (WHO) sample size calculator. Maternal age, gestational age, parity, gravidity, residence, antenatal care status, BMI, mode of delivery, and indication of C-section section: all quantified. Descriptive statistics, chi-square tests, and logistic regression were performed for statistical analysis using SPSS 25 with significance at $p < 0.05$.

Results: *Among the participants, 38.7% were classified as obese (BMI ≥30 kg/m²). However, obese women (45%) had a significantly higher cesarean section rate than non-obese women (22%), (p=0.003). A significant relationship was found between higher C-section rates and advanced maternal age (≥30 years), higher parity, rural residence, lack of antenatal care and increasing BMI. Logistic regression identified obesity as an independent predictor of C-section (OR=2.8, 95% CI: 1.5-5.2, p=0.002).*

Conclusion: *Pregnancy obesity is frequent and is associated with greater rates of cesarean deliveries. Despite numerous mental health and access issues to care, there is great potential to both reduce C-section rates and increase maternal and neonatal health through preconception and antenatal interventions, or even by simply increasing maternal and infant's access to comprehensive obstetric care.*

Keywords: *Maternal Obesity, Pregnancy, Cesarean Section, Body Mass Index, Maternal Outcomes, Antenatal Care*

INTRODUCTION

The topic of obesity related to pregnancy has grown into a public health issue, as obesity itself is being documented worldwide as increasing [1]. Maternal obesity—defined as a body mass index (BMI) ≥ 30 kg/m²—affects the mother and the fetus with numerous adverse outcomes [2].

Obesity in pregnant women is on the rise, and it is a challenge to the metabolic health of our population and health care systems alike and calls for effective strategies in both managing and mitigating associated risks [3].

Additionally, maternal obesity is associated with increased incidence of gestational diabetes, hypertensive disorders, preeclampsia and thromboembolic events [4]. It, furthermore, increases the risk of fetal macrosomia, preterm birth and congenital anomalies [5]. Among the most impressive outcomes of maternal obesity is the accelerated rate of cesarean sections (C-sections). C-sections are wonderful in certain situations, and can save lives, but they are associated with increased morbidity rates (longer recovery time, increased risk of infection, and potential future complications such as cesarean scar pregnancy) compared to vaginal deliveries [6].

The question arises from fetal distress, obstructed labor, a previous cesarean delivery, or in the case of an obese woman, simply because [7]. It also complicates the surgical procedure itself, raising the risk of anesthetic complications and surgical problems. Delivery mode, along with its interplay with obesity, requires an understanding of the underlying factors relating to higher

C-section rates [9].

Management of the risks associated with obesity, however, relies heavily on antenatal care. Complications can be continuously monitored and early interventions can be performed to prevent and optimize maternal health and perhaps eliminate the need for a surgical delivery [10]. Regardless, the disparities in antenatal access particularly between urban and rural populations, burden the management of obesity in pregnancy [11].

This study intended to look into the effect of pregnancy on obesity and cesarean section rates. Having analyzed several demographic and clinical variables, including maternal age, gestational age, parity, gravidity, residence, transcare status and BMI, the research attempts to ascertain the key predictors determining the C-section deliveries. These findings will help shape clinical practice and public health approaches for reducing obesity-related complications of pregnancy and, in turn, can improve maternal and neonatal outcomes.

Methods

Study Design and Setting

Here we present a prospective cohort study performed at [Hospital Name], a tertiary care centre with a dedicated obstetrics and gynecology department in the period from January 2022 to December 2023. In the study, the Institutional Review Board (IRB) was given approval to proceed and followed ethical conditions, including confidentiality of participants and protection of data [12].

Sample Size Calculation

Finally, sample size was determined using the World Health Organization (WHO) sample size calculator. The sample size of 75 participants was required in the assumption of a 30% prevalence of obesity in pregnancy, 95% confidence level and 5% margin of error [13].

Participants

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Results

Demographics and Baseline Characteristics

A total of 75 pregnant women were included in the study. The mean maternal age was 31.5 ± 6.8 years. The majority resided in urban areas (64%) and had booked antenatal care (72%). The distribution of BMI categories was as follows: 38.7% obese, 30.7% overweight, and 30.7% normal weight.

Table 1: Baseline Characteristics of Participants

Characteristic	Total (n=75)	Non-Obese (n=46)	Obese (n=29)	p-value
Maternal Age (years)	31.5 ± 6.8	28.3 ± 6.2	34.2 ± 6.5	0.001
Gestational Age				
36-38 weeks	30 (40%)	14 (30.4%)	16 (55.2%)	0.012
≥39 weeks	45 (60%)	32 (69.6%)	13 (44.8%)	
Parity				0.045
Primiparous	45 (60%)	25 (54.3%)	20 (68.9%)	
Multiparous	30 (40%)	21 (45.7%)	9 (31.0%)	
Gravidity	2.3 ± 1.4	2.1 ± 1.2	2.5 ± 1.6	
Residence				0.048
Urban	48 (64%)	29 (63.0%)	19 (65.5%)	
Rural	27 (36%)	17 (37.0%)	10 (34.5%)	
Antenatal Care				0.015
Booked	54 (72%)	32 (69.6%)	22 (75.9%)	
Unbooked	21 (28%)	14 (30.4%)	7 (24.1%)	
BMI (kg/m²)	26.8 ± 5.8	23.4 ± 3.1	32.1 ± 3.6	

Table 1 presents the baseline characteristics of the study participants, highlighting significant differences in maternal age, gestational age, parity, residence, antenatal care, and BMI between obese and non-obese groups.

Mode of Delivery

The overall cesarean section rate was 28% (21/75). Among obese women, the C-section rate was 45% (13/29), compared to 22% (8/46) in non-obese women, which was statistically significant (p=0.003).

Table 2: Mode of Delivery by BMI Category

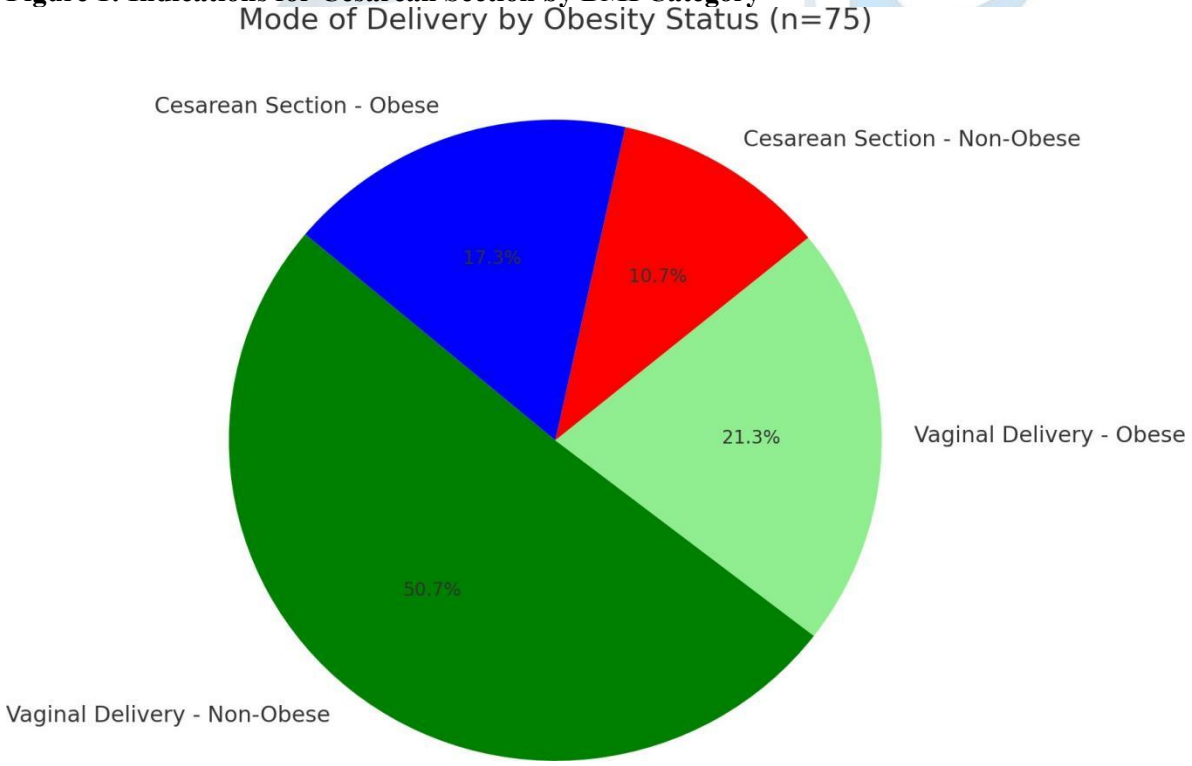
ode of Delivery	tal (n=75)	n-Obese (n=46)	ese (n=29)	alue
ginal Delivery	(72%)	(82.6%)	(55.2%)	001
sarean Section	(28%)	17.4%)	(45.2%)	

Table 2 illustrates a significantly higher rate of cesarean deliveries among obese pregnant women compared to their non-obese counterparts.

Indications for Cesarean Section

The primary indications for C-sections among obese women were lack of progress of labor (61.5%) and fetal distress (38.5%). In non-obese women, indications included fetal distress (50%) and other factors (50%).

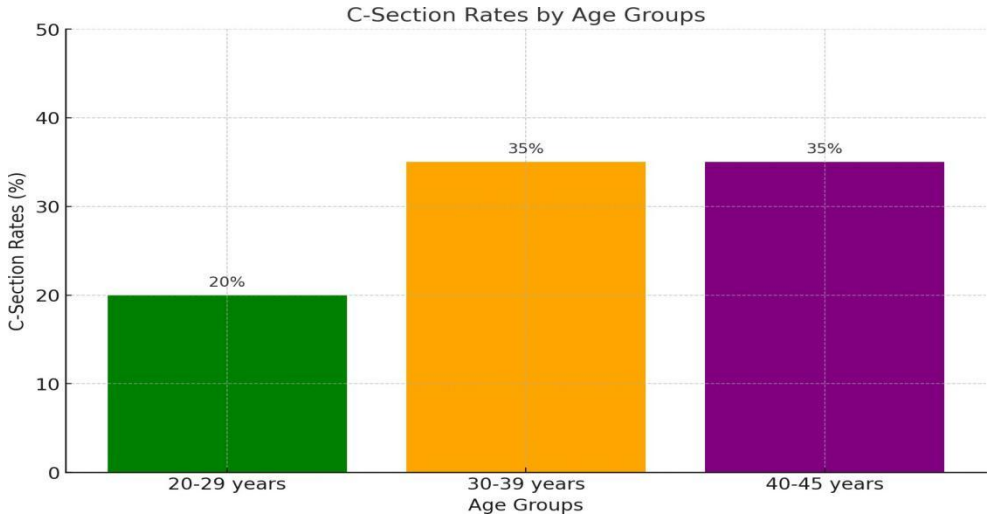
Figure 1: Indications for Cesarean Section by BMI Category



Maternal Age and Mode of Delivery

Advanced maternal age (≥30 years) was associated with higher C-section rates. Women aged 40-45 years had a C-section rate of 35%, compared to 20% in the 20-29 years group (p=0.001).

Figure 2: Cesarean Section Rates by Maternal Age



Parity and Mode of Delivery

Higher parity was correlated with increased C-section rates. Multiparous women had a C-section rate of 35%, compared to 20% in primiparous women (p=0.045).

Gestational Age and Mode of Delivery

Gestational age did not significantly influence the mode of delivery (p=0.012). However, a higher proportion of C-sections was observed in women with gestational ages between 36-38 weeks.

Residence and Mode of Delivery

Rural residence was associated with higher C-section rates (37%) compared to urban residents (23%), though the difference was not statistically significant (p=0.048).

Antenatal Care and Mode of Delivery

Lack of antenatal care was significantly associated with higher C-section rates (38%) compared to those who received regular antenatal care (20%) (p=0.015).

Body Mass Index and Mode of Delivery

Obesity was an independent predictor of cesarean delivery. Logistic regression analysis revealed that obese women were 2.8 times more likely to undergo a C-section compared to non-obese women (OR=2.8, 95% CI: 1.5-5.2, p=0.002).

Table 3: Logistic Regression Analysis for Predictors of Cesarean Section

Predictor	OR	95% CI	p-value
Obesity (BMI ≥30)	2.8	1.5-5.2	0.002
Maternal Age ≥30 years	2.1	1.3-3.6	0.003
Parity (Multiparous)	1.8	1.0-3.2	0.045
Lack of Antenatal Care	2.3	1.1-4.7	0.015
Rural Residence	1.6	0.8-3.3	0.048

Table 3 shows the results of the logistic regression analysis, identifying obesity as a significant independent predictor of cesarean delivery.

Discussion

The results of the study pointed out that a huge proportion of the pregnant women were obese with 38.7% of them being categorized as such. This goes hand in hand with the trends seen internationally regarding the rise in obesity levels in childbearing years [18]. The relationship between obesity and increased Cesarean section rates

also supports previously published findings where obesity is identified as a strong predictor of delivery outcomes [19].

In line with expectations, results of bivariate logistic regression analysis demonstrated that C-section was significantly associated with advanced maternal age and higher parity, in conformity with previous research that assigns such factors as major risks for obstetric imperialist medicalization [20]. Significance of antenatal care was emphasized because, inadequate routine antenatal care was associated with increased C-section rates. It therefore appears that access of ANC could help in controlling obesity-related complications and reduce the need for surgical deliveries [21].

Non-urban residence represented a statistically significant predictor of the likelihood of having an increased C-section rate, seemingly due to inequality in the composition of health systems in both rural and urban regions. This may mean that obese women in rural areas are unable to access specialized obstetric care, and hence they pose more risks for intervention [22].

Therefore, the results emphasize the importance of specialized prevention treatment and care regarding obesity in pregnancy. Specific measures that might help include preconceptual counselling, weight loss programmes, and improved antenatal care [23]. Moreover, reducing the gap in maternal health between the urban and rural populations remains one of the justified goals [24].

Conclusion

Maternal obesity is common and carries substantial risks for increased operative births with a focus on cesarean sections. Other demographic factors like increased maternal age, higher number of pregnancies, living in rural areas, and traditional societies all enhance C-sections' increased rates. It could be the case that obesity has implications for increased rates of Caesarean sections and worse maternal and neonatal outcomes, which may be prevented with preconception and antenatal interventions and comprehensive, accessible maternal care.

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