International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Research Article

A Study Of Impact Of Maternal Overweight And Obesity On Feto-Maternal Outcome At Tertiary Care Center

Dr Sowmya D[1], Dr Haseena O[2], Dr Mamatha S[3], Dr Somashekar H K[4]

[1]Associate professor, Department of Department of Obstetrics and gynecology, Kodagu institute of medical sciences, Madikeri
[2]Junior Resident, Department of Department of Obstetrics and gynecology, Kodagu institute of medical sciences, Madikeri.
[3]Associate professor, Department of Department of Obstetrics and gynecology, Kodagu institute of medical sciences, Madikeri
[4]Professor and Head of Department, Department of Department of Obstetrics and gynecology, Kodagu institute of medical sciences, Madikeri

Corresponding Author:

Dr Sowmya D
Associate professor, Department of Department of Obstetrics and gynecology, Kodagu institute of medical sciences, Madikeri

Received: 22-09-2025
Accepted: 06-10-2025
Available online: 20-10-2025

ABSTRACT

BACKGROUND: Obesity has emerged as a major public health issue in india in the 21st century, currently affecting approximately 5% of the population[1]. Alarmingly, the prevalence of overweight and obesity among women of reproductive age is steadily rising, with an estimated 22% of women aged 20 to 39 years falling into this category[2]. The impact of maternal obesity on pregnancy outcomes has been recognized as early as 1945.

Pre-pregnancy obesity significantly compromises both maternal and fetal health. An elevated body mass index (bmi) is consistently associated with an increased risk of adverse obstetric and perinatal outcomes.[3] among obese women, the most frequently encountered maternal complications include gestational diabetes mellitus, pregnancy-induced hypertension, preeclampsia, venous thromboembolism, increased rates of labor induction, and a higher likelihood of cesarean delivery.[4]

Fetal complications are equally concerning. Maternal overweight and obesity are linked to a greater risk of stillbirth, perinatal death, preterm birth, fetal macrosomia, congenital anomalies, and increased neonatal intensive care unit (nicu) admissions. These findings underscore the importance of preconception counseling, weight optimization, and comprehensive antenatal care to mitigate risks and improve pregnancy outcomes.[5] **METHODOLOGY:** This prospective observational study was conducted in the department of obstetrics and gynaecology at kodagu institute of medical sciences (koims), madikeri. The study spanned a period of 12 months, from february 2024 to february 2025. Patients who attended the department during this time and met the inclusion criteria were considered for participation. A convenience sampling method was used to recruit study subjects. **RESULTS:** The study revealed a mean maternal age of 26.76 years, with average height, weight, and bmi recorded at 152.90 cm, 67.69 kg, and 28.92 kg/m², respectively. Most participants were multigravida and presented at term gestation (37–40 weeks). A significant proportion (64.5%) were classified as obese.

Maternal complications—including prior abortion, gestational diabetes, hypertension, preeclampsia, prom, abruption, induction of labor, cesarean delivery, pph, wound infection, and dehiscence—showed no statistically significant association with elevated bmi ($p > 0.05$ for all). However, neonatal outcomes such as low apgar scores at 1 minute ($p = 0.050$) and fetal macrosomia ($p = 0.027$) demonstrated significant correlations with maternal overweight and obesity.

Other neonatal parameters—birth weight, apgar at 5 minutes, prematurity, iugr, postdatism, meconium-stained liquor, jaundice, rds, and nicu admission—were not statistically associated. Birth weight distribution showed that 82.5% of neonates weighed 2.5–3.99 kg, while both low birth weight (<2.5 kg) and macrosomic (≥4 kg) infants accounted for 8.8% each. **Conclusion**: This prospective observational study evaluated the effects of maternal overweight and obesity on pregnancy outcomes. The mean age of participants was 26.76 years, with most falling into the overweight or obese category based on bmi. A majority were multigravida and

delivered between 37–40 weeks, with lscs being the most common mode of delivery, primarily due to previous cesarean sections. Biochemical and coagulation parameters remained within normal ranges. While maternal complications such as gdm, ghtn, preeclampsia, prom, and pph were more frequent in overweight and obese women, they were not statistically significant. However, fetal outcomes like low apgar score at 1 minute (p=0.05) and macrosomia (p=0.027) showed significant association with higher maternal bmi. Other neonatal issues, including nicu admission, rds, and preterm birth, were observed more often but without statistical significance. Importantly, no cases of dvt, puerperal sepsis, or stillbirth occurred.

Keywords*: Maternal obesity, Maternal overweight, Feto-maternal outcomes, Pregnancy complications, Neonatal outcomes.*

INTRODUCTION

The world health organization (who) considers it a "global epidemic," affecting both developed and developing countries [6]. In india, obesity is rapidly increasing alongside persistent undernutrition, with over 30 million obese individuals[7]. This rise, driven by urbanization, sedentary lifestyles, and dietary changes, has led to a surge in non-communicable diseases such as diabetes, hypertension, and cardiovascular disorders[8]. Of particular concern is the increasing prevalence of obesity among women of reproductive age, which is linked to adverse pregnancy outcomes including gestational diabetes, hypertensive disorders, cesarean delivery, macrosomia, and perinatal mortality[9]. It also complicates prenatal care and increases long-term health risks for both mother and child. Early recognition and management of maternal obesity, beginning preconception and continuing postpartum, are essential to improve outcomes, especially in resource-limited settings like india.[10]

METHODOLOGY

This prospective observational study was conducted over a 12-month period, from february 2024 to february 2025, in the department of obstetrics and gynaecology at kodagu institute of medical sciences (koims), madikeri. The study aimed to evaluate the impact of maternal overweight and obesity on maternal and neonatal outcomes in a tertiary care setting. Participants were selected through convenience sampling from among pregnant women attending the antenatal outpatient services.

ELIGIBILITYCRITERIA:

Women aged 18 to 35 years with singleton pregnancies at any gestational age (not in active labor) were included, provided they had documented antenatal visits and a prepregnancy body mass index (bmi) >23 kg/m². Only those willing to provide informed written consent were enrolled. Exclusion criteria comprised a prior history of chronic illnesses such as diabetes mellitus, hypertension, thrombophilia, hypothyroidism, the presence of fetal anomalies, conception via assisted reproductive technologies, or unwillingness to participate.

DATACOLLECTION

Following approval from the institutional scientific and ethical committees of koims, eligible participants were enrolled. A comprehensive clinical history was recorded, followed by physical and obstetric examination. Bmi was calculated using the standard formula:

Participants were stratified into overweight and obese categories based on bmi and followed through pregnancy, labor, and postpartum for evaluation of maternal and fetal outcomes. Maternal parameters assessed included gestational diabetes mellitus (gdm), gestational hypertension, preeclampsia, mode and timing of delivery, need for induction, postpartum hemorrhage (pph), wound infection, puerperal sepsis, and deep vein thrombosis (dvt). Fetal parameters evaluated included birth weight, macrosomia, intrauterine growth restriction (iugr), apgar scores at 1 and 5 minutes, neonatal respiratory distress, and the need for nicu admission.

STATISTICALANALYSIS:

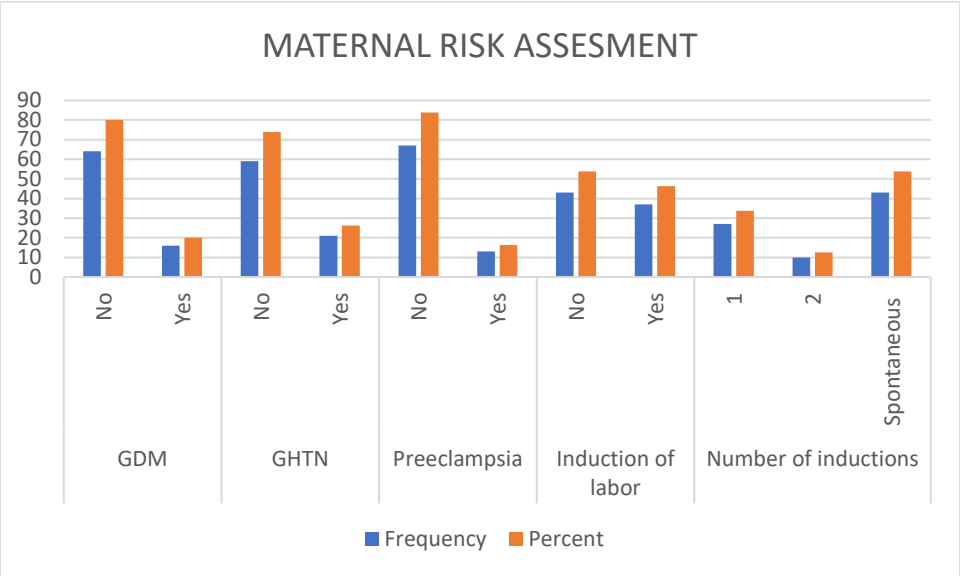
All data were compiled and analyzed using spss software version 21. Descriptive statistics, including mean and standard deviation for continuous variables and frequencies with percentages for categorical variables, were computed. The chi-square test was used to examine associations between maternal bmi and various maternal and fetal outcomes. A p-value of <0.05 was considered statistically significant.

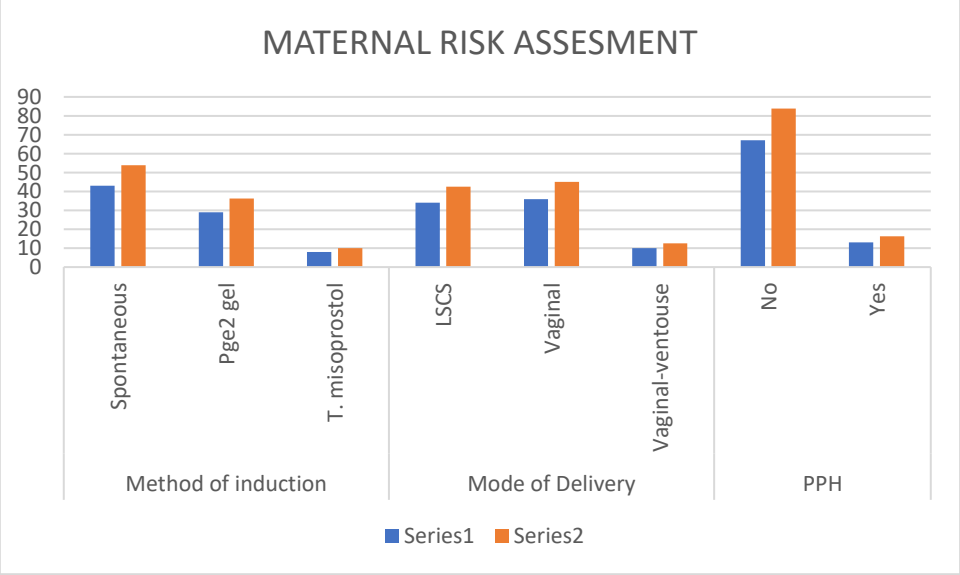
RESULTS

1. MATERNAL RISK ASSESMENT:

In this study, maternal obesity was demonstrably linked to a wide array of obstetric complications, underscoring its profound impact on maternal health. **Gestational diabetes mellitus (gdm)** was diagnosed in **16 out of 80 women (20.0%)**, indicating a notable predisposition toward glucose intolerance in obese gravidae. Similarly, **gestational hypertension (ghtn)** was identified in **21 women (26.3%)**, while **preeclampsia** was reported in **13 participants**

(16.3%), reflecting the well-documented correlation between increased adiposity and vascular endothelial dysfunction. The incidence of **pregnancy-induced hypertension (pih)**, when inclusive of both ghtn and preeclampsia, affected a combined total of **34 women (42.6%)**, signifying a substantial hypertensive burden among the obese cohort. The necessity for **induction of labor** was observed in **37 cases (46.3%)**, suggesting a heightened likelihood of suboptimal spontaneous labor initiation, possibly due to metabolic or mechanical derangements associated with obesity. The **mode of delivery** further illustrated this trend, with **lower segment cesarean section (lscs)** performed in **34 women (42.5%)**, and **instrumental vaginal deliveries using ventouse** in **10 cases (12.6%)**, while only **36 women (45.0%)** achieved unassisted vaginal births. Furthermore, **postpartum hemorrhage (pph)** was encountered in **13 women (16.3%)**, a finding that aligns with the known risk of uterine atony and impaired contractility in obese parturients. Post-surgical morbidities were also prevalent, with **wound infections** affecting **8 women (10.0%)** and **wound gaping** noted in **2 women (2.5%)**, complications potentially exacerbated by impaired tissue perfusion and delayed healing commonly seen in obese individuals. Collectively, these findings reinforce the multifaceted risks maternal obesity poses to pregnancy, labor, and the puerperium, emphasizing the imperative for anticipatory guidance, early screening, and multidisciplinary management strategies in this high-risk population.





2. ASSOCIATION OF MATERNAL RISK FACTORS WITH BMI :

Among the obese group, **11 women (20.4%)** developed **gestational diabetes mellitus (gdm)** compared to **5 women (19.2%)** in the overweight group. Though the percentage is slightly higher in the obese group, both categories showed a relatively comparable incidence of gdm. Similarly, the occurrence of **gestational hypertension (ghtn)** was significantly more prevalent among obese women, with **17 out of 54 (31.5%)** developing ghtn, while only **4 out of 26 (15.4%)**

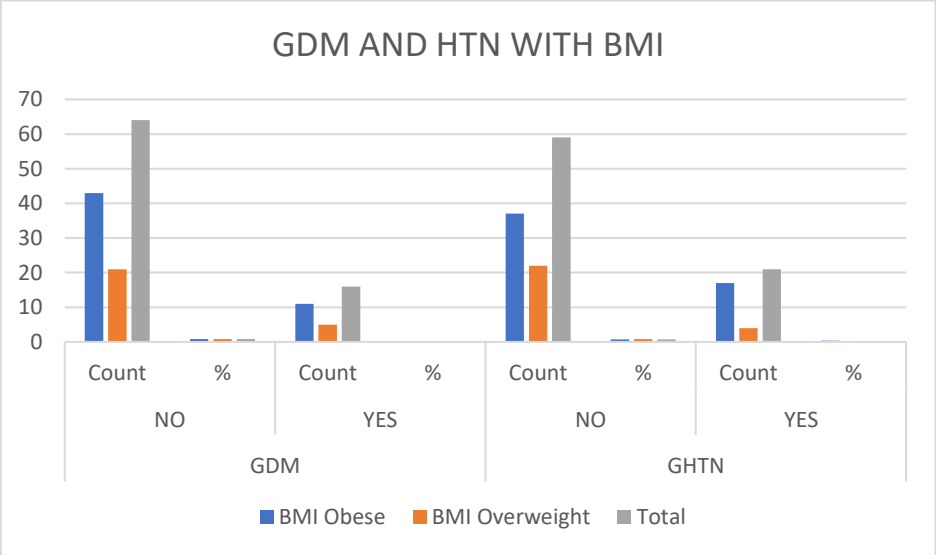
overweight women were affected. This indicates a notable association between increasing bmi and hypertensive disorders during pregnancy.

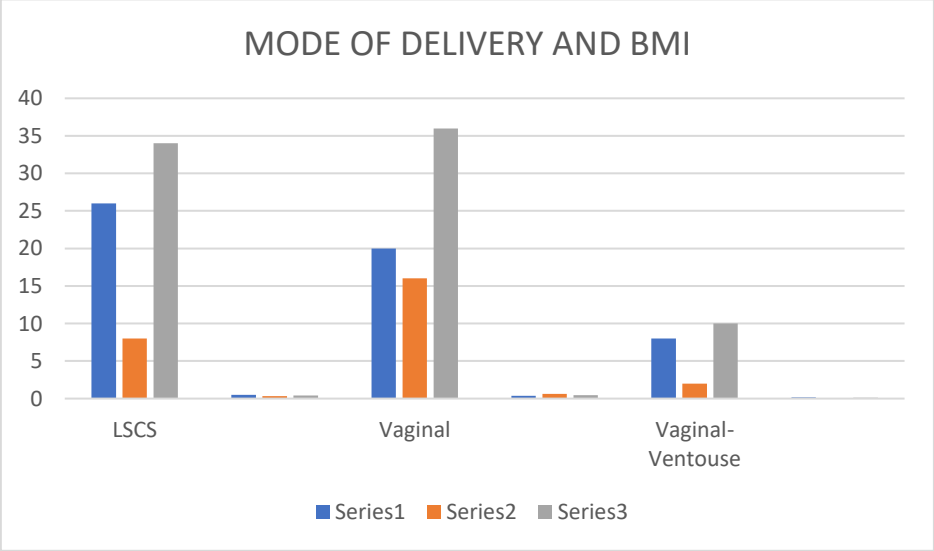
When analyzing the occurrence of **preeclampsia**, it was observed that **8 obese women (14.8%)** were diagnosed with this condition compared to **5 overweight women (19.2%)**. While both groups experienced preeclampsia, the slightly higher percentage in the overweight group suggests that both overweight and obesity are risk contributors, though not strictly dependent on bmi category alone.

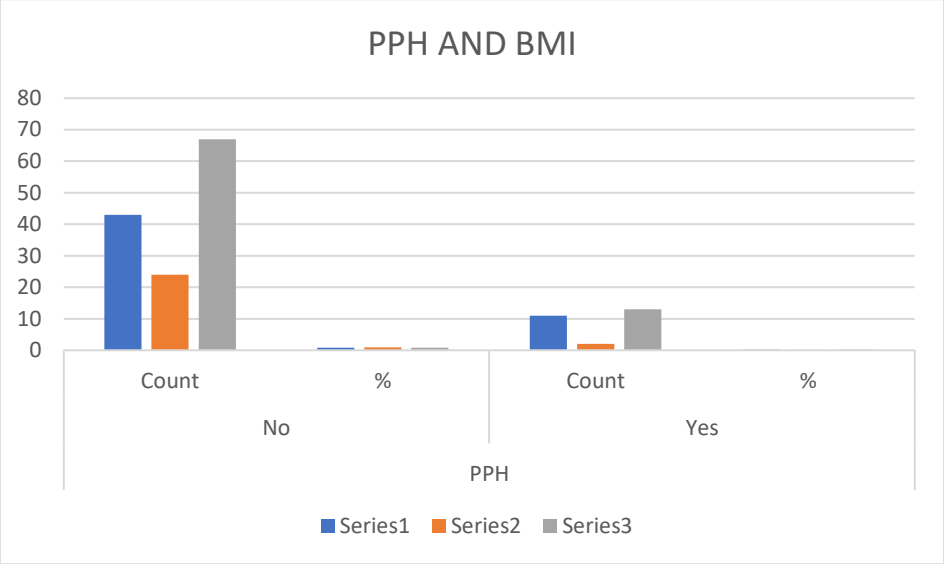
The **mode of delivery** also reflected marked differences. **Caesarean section (lscs)** was more frequently required among obese women, with **26 cases (48.1%)**, as compared to **8 cases (30.8%)** in the overweight group. Vaginal delivery was achieved in **20 obese women (37.0%)** and **16 overweight women (61.5%)**, indicating that overweight mothers had a better chance of delivering vaginally. The use of **instrumental delivery (vaginal-ventouse)** was higher in the obese group, reported in **8 women (14.8%)**, whereas only **2 overweight women (7.69%)** required such assistance. These trends underscore the challenges posed by higher bmi in achieving spontaneous vaginal delivery.

Postpartum complications also varied with bmi. **Postpartum hemorrhage (pph)** was reported in **11 obese women (20.4%)**, a much higher incidence compared to **2 overweight women (7.7%)**. This indicates that obesity may predispose to increased risk of pph. On the other hand, **43 obese women (79.6%)** and **24 overweight women (92.3%)** did not experience pph, showing a relatively better outcome in the overweight group.

Overall, these findings highlight that maternal obesity is associated with a **higher risk** of adverse pregnancy outcomes, including **gestational hypertension**, **cesarean delivery**, **instrumental delivery**, and **postpartum hemorrhage**. Though overweight women also face risks, the incidence and severity are notably **more pronounced in obese pregnant women**.

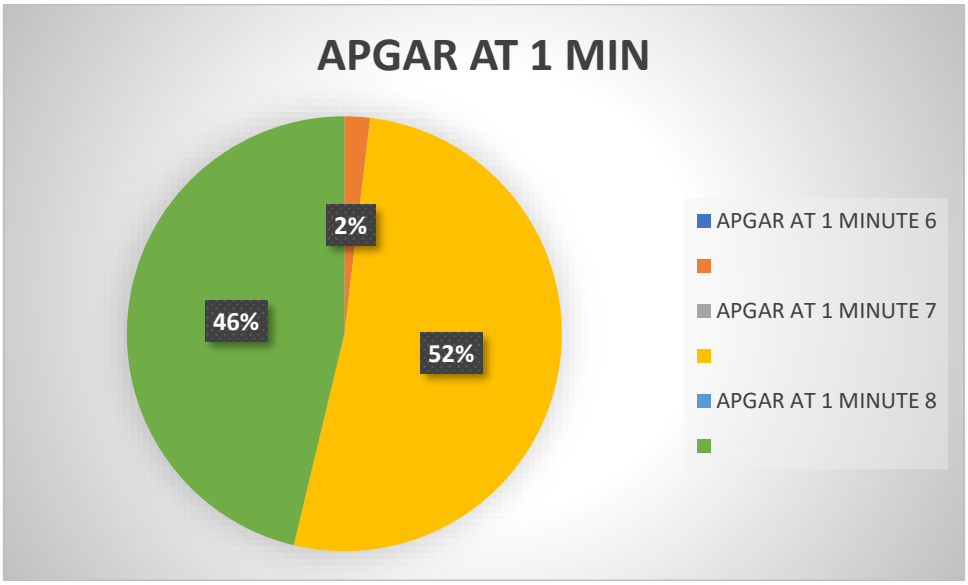


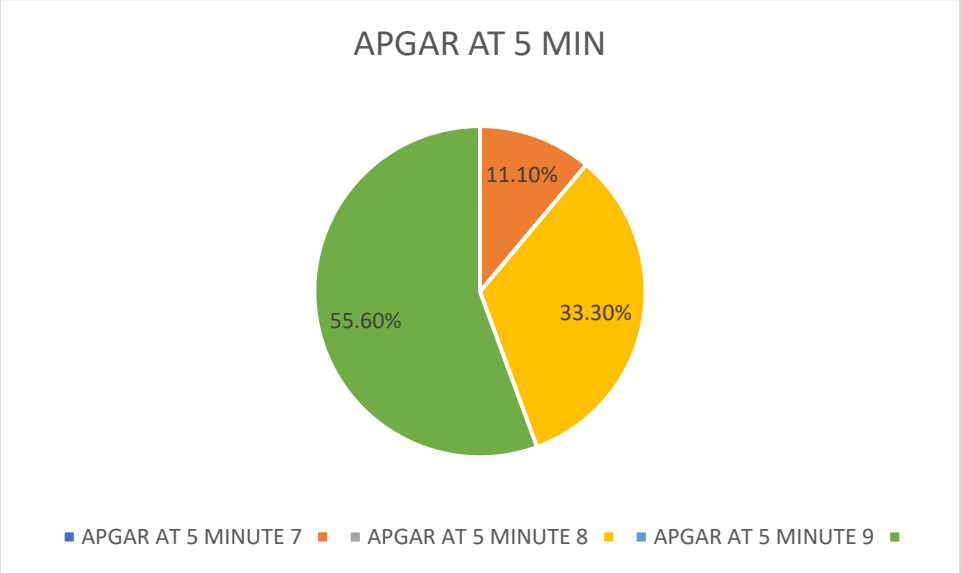




3. ASSOCIATION OF FOETAL RISK FACTORS WITH BMI :

Based on the analysis of fetal risk factors among obese and overweight pregnant women, several significant trends were observed. In terms of birth weight, the majority of newborns in both groups had normal weights (2.5–3.99 kg), with 77.8% in the obese group and a higher 92.3% in the overweight group. Notably, macrosomia (birth weight ≥ 4 kg) was found exclusively in the obese group, affecting 13% of cases, while no macrosomic babies were born to overweight mothers. Low birth weight (<2.5 kg) was slightly more common in the obese group (9.3%) than in the overweight group (7.7%). Regarding apgar scores at 1 minute, 46.3% of neonates born to obese mothers had a score of 8, and 51.9% scored 7, whereas 73.1% of neonates born to overweight mothers scored 8 and only 23.1% scored 7, indicating better immediate neonatal condition in the overweight group. At 5 minutes, an apgar score of 9 was observed in 76.9% of babies from overweight mothers compared to 55.6% in the obese group, again suggesting better neonatal adaptation among the overweight group. Macrosomia was noted in 16.7% (9 out of 54) of obese mothers and none in the overweight group, reaffirming the association between obesity and increased fetal size. Respiratory distress syndrome (rds) was significantly higher in neonates born to obese mothers (40.7%) than in those born to overweight mothers (19.2%). Intrauterine growth restriction (iugr) was seen in 11.1% of the obese group and 7.7% of the overweight group. These findings collectively indicate that maternal obesity poses greater risks for adverse fetal outcomes, including macrosomia, lower apgar scores, increased incidence of respiratory distress, and iugr, compared to being overweight.





CONCLUSION

Based on the findings of the present study, among the fetal risk factors, a low apgar score at 1 minute (p = 0.050) and macrosomia showed a statistically significant association with maternal overweight and obesity, whereas maternal risk factors such as gestational diabetes, hypertension, preeclampsia, and delivery-related complications were not significantly associated. The study concludes that maternal obesity poses a notable risk for adverse neonatal outcomes, underlining the importance of weight optimization during pregnancy.

Conflicts of interests: The authors declare no conflicts of interest.
Author contribution: All authors have contributed in the manuscript.
Author funding: Nill

REFRENCES

1. Jameson j, fauci as, kasper dl, hauser sl, longo dl, jameson lj. Harrison's principles of internal medicine. 20th new york: the mcgraw-hill companies, 2018;2837(2):9781259644030.
2. Afshin a, forouzanfar mh, reitsma mb, sur p, estep k, lee a et al. Health effects of overweight and obesity in 195 countries over 25 years. N engl j med 2017; 377(1): 13-27.
3. Simko m, totka a, vondrova d, samohyl m, jurkovicova j, trnka m, et al. Maternal body mass index and gestational weight gain and their association with pregnancy complications and perinatal conditions. Int j environ res public health 2019; 16(10): 1751.
4. World health organization. Obesity: preventing and managing the global epidemic. Geneva: world health organization; 2000.
5. James wpt. Who recognition of the global obesity epidemic. Int j obes. 2008;32(7):120-6.
6. World health organization. Obesity and overweight. Fact sheet n 311, january 2015. Available at: http://www.who.int/mediacentre/ factsheets/fs311/en/
7. Vijay a, maran g, koothan v. Impact of maternal obesity on obstetric outcome in a rural population in pondicherry. Int j reprod contracept obstet gynecol 2015;4:740-4.
8. National institute for health and clinical excellence. Obesity. Guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children. London: national institute for health and clinical excellence (nice); 2006.
9. International institute for population sciences. National family health survey (nfhs-2). 1998-99: 2000;438.
10. International institute for population sciences. National family health survey (nfhs-3) 2005-06: india vii. Mumbai: international institute for population sciences. 2007:168.
11. International institute for population sciences. National family health survey (nfhs-3) 2005-06: india. Vi. Mumbai: international institute for population sciences. 2007:540.