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ORIGINAL ARTICLE

Frequency of Maternal Intrapartum Complications of Macrosomic Fetus

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ABSTRACT

Introduction: Macrosomia is a clinical problem that can lead to birth injury, intervention, postpartum haemorrhage and other adverse outcomes. Incidence of macrosomia has increased in the last 10-20 years.

Objective: To determine the frequency of maternal intra partum complication of macrosomic fetus.

Material and Methods: The study was conducted at Afridi Medical Complex and Teaching Hospital Tehkal Peshawar. Duration of this study was one year from May 2022 to May 2023. In this study a total of 97 (nearly 100 patients) keeping 20% prevalence of instrumental vaginal deliveries, 95% confidence level and 8% precision value. More over it was a descriptive (cross sectional) study in which non probability consecutive sampling technique was used.

Results: In this study most of the patients 70% were in age range 30-45 years, 85% patients had POG 37-40 weeks, 80% patients were multigravidas, 30% had post date pregnancy, 40% patients were obese and 30% patients were diabetic in which 5% had chronic diabetics and 25% patients had gestational diabetics. Thirty five maternal intrapartum complications were found among 100 patients, in which 14% patients had shoulder dystocia, 26% patients had caesarean section, 6% patients had instrumental delivery, 26% patients had genital tract trauma and 29% patients had post partum haemorrrhage.

Conclusion: Our study concludes that the frequency of maternal intrapartum complications of macrosomic fetus is high. With increasing in number of diabetes and obesity, the incidence of macrosomia and hance its consequences are increasing. With timely anticipation and managing the complication maternal as well as fetal morbidity can be reduced.

Keywords: Frequency; Maternal intrapartum; Complications; Nacrosomic fetus

INTRODUCTION

Diabetes among mothers with inadequate management is linked to fetal macrosomia. The enlarged fetus is the result of increased fetal insulin production, which in turn causes higher glycogen deposition. The term "fetal macrosomia" refers to fetuses that are larger than the 90th percentile on fetal growth charts; newborns born weighing more than 4 kg are considered macrosomic[1]. A clinical issue called macrosomia may result in postpartum hemorrhage, intervention, birth injury, intervention, and other negative consequences. Macrosomia births are on the rise for both Caucasians and other ethnic groups, according to Northern Sydney Area Health Statistics. The precise weight at which macrosomia is referred to is up for debate, despite Rodrigues' definition of the condition being birth weight over the 90th percentile for gestational age[2]. Some researchers, like Modanlou, Dorchester, Boyd, Usher, and Varner, described macrosomia as a birth weight of 4500 grams or more, whereas Schlater and Bhatia described it as a weight of 4000 grams or more[3-6]. Rouse and Owen investigated prophylactic cesarean delivery for fetal macrosomia identified by ultrasonic weight estimate using both a 4000 gram and a 4500 gram cut off. Because the weight predictions were inaccurate, neither weight cutoff affected the outcomes. According to Hadlock, the challenge of acquiring ultrasonic pictures at the appropriate imaging plane to measure the abdomen circumference is one of the limits of calculating fetal weight[3]. Benson went on to note that weight formulae that include the head, abdomen, and femur have a 95% confidence range of plus/minus 24% in diabetes pregnancies. More significantly, Hadlock states that fetal weight charts often employ babies with normal body proportions, but fetuses with macrosomia have greater fat mass and, as a result, are more likely to overestimate weight by as much as 4%[4,5]. This was consistent with Bernstein's findings that the ultrasonography calculation of fetal weight in mothers with diabetes was impacted by fetal fat[6]. Ethnicity, maternal height, and genetics—all of which have a significant impact on fetal size and birth weight—were not included in any of these investigations. Although a birth weight of 4,000 grams could be considered macrosomic in one community, a population with smaller mothers may experience the possible delivery difficulties associated with macrosomia at a lower birth weight. Fetal macrosomia is linked to obstetric intervention, shoulder dystocia, postpartum hemorrhage, and elevated risks, as was previously noted. Maternal obesity, advanced age, a history of large babies, or diabetes are risk factors. To lessen the need for delivery intervention and problems, efforts have been undertaken to identify and forecast antepartum macrosomia. With a 51% positive predictive value for LGA and a 67% positive predictive value for macrosomia, Benson evaluated both normal and abnormal fetal development and found that ultrasonic weight estimate was less accurate in bigger fetuses. According to Varner, a comprehensive obstetric history and physical checkup may detect up to 53% of kids with macrosomia, with a 10% false positive rate. Maternal obesity increases the incidence of macrosomia four times, while post-term and gestational diabetes mellitus raise it 2.5 times. This was dependent on the capacity to measure fundal height and was not accurate if the fetus was not in the vertex position. Ethnic effect was likewise excluded from the methodology[7,8].

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MATERIAL AND METHODS

Setting: The study was conducted at Afridi Medical Complex and Teaching Hospital Tehkal Peshawar

Duration: One year from May 2022 to May 2023.

Sample size: Sample size was calculated to be 97 (nearly 100 patients) keeping 20% prevalence of instrumental vaginal deliveries, 95% confidence level and 8% precision value.

Sampling Technique: non probability consecutive

Study Design: Descriptive (cross sectional) study

Sample Selection: Randomize control trail.

Inclusion Criteria: Pregnant ladies of all gravidity and parity with single fetus. Gestational age between 37 and 42 weeks with clinically adequate pelvis was included. Diabetic ladies were also be included in this study.

Exclusion Criteria: All pregnant women with

- Contracted pelvis (because ladies with contracted pelvis and macrosomic fetus are not given trail of labor and go through caesarean).

- Previous scard uterus (because of fear of rupture of uterus pregnant ladies with scard uterus and macrosomic fetus go through caesarean) as it may introduce bias in my study.
- Short stature (because o fear of obstructed labor)
- Pregnancy with intra uterine growth retardation (because weight of the baby is usually less than 2.5 kg and thus it cannot fit into the criteria of macrosomia) and therefore modifying the study result.
- Multiple fetuses (usually small for gestational age) as this introduces bias in the study.

Data Collection Procedure: Among the patient coming to Gynae A unit KTH labor room through OPD and casualty those who are fulfilling the inclusion criteria were included in the study after obtaining their informed written consent and taking permission from hospital ethical committee. Detail history including maternal age and parity was noted. Gestational age was determined either from 1st day of last menstrual period or first or second trimester ultrasound. A through general physical examination including weight age and height of mother was carried out. Fundal height was measured through measuring rape. Investigations like random blood sugar and ultrasound for period of gestation & estimated birth weight was done. Strictly exclusion criteria was followed and all the observations were made by single observer so that to exclude any bias and confounding variables in my study. All the information were collected through proforma.

Data Analysis: The analysis was performed by using SPSS version 10.0. All qualitative variables like post portal hemorrhage ,cesarean section, instrumental deliveries and genital tract trauma were analyzed through frequency and percentages. While the quantitative variables like period of gestatation, gravidity, maternal height, maternal weight, fundal height and prolonged second stage of labor, birth weight was analyzed through mean and SD. The results were presented in the form of tables and graphs.

RESULTS

Age distribution among 100 patients was analysed as most of the patients n=70(70%) were in age range 30-45 years while n=30(30%) patients were in age range 20-30 years. Mean age was 30 years with standard deviation ± 2.1. Gestational age among 100 patients was analysed as most of the patients n=85(85%) had POG 37-40 weeks while n=15(15%) patients had POG 41-42 weeks. Mean period of gestation was 41 weeks with standard deviation ± 3.65. Gravidity status among 100 patients was analysed as most of the patients n=80(80%) were multigravidas while n=20(20%) patients were primigravidas. Mode of delivery among 100 patients was analysed as most of the patients n=50(50%) had spontaneous vaginal delivery, followed by n=30(30%) patients had caesarean section, n=16(16%) patients had vacuum delivery and only n=4(4%) patients had forceps delivery. (Table 1)

In this study a total of 35 maternal intrapartum complication were found among 100 patients, in which n=5(14%) patients had shoulder dystocia, n=9(26%) patients had caesarean section, n=2(6%) patients had instrumental delivery, n=9(26%) patients had genital tract trauma and n=10(29%) patients had post partum haemorrrhage. (Figure 1)

Table 1: Demographic parameters of the enrolled patients

Parameter	Sub-category	Frequency (%)
Age of the patient	20-30 years	30 (30%)
	30-45 Years	70 (70%)
Gestational age	37-40 Weeks	85 (85%)
	41-42 Weeks	15 (15%)
Gravidity	Primigravida	20 (20%)
	Multigravida	80 (80%)
Mode of delivery	Spontaneous vaginal delivery	50 (50%)
	Vacuum delivery	16 (16%)
	Forceps delivery	4 (4%)
	Ceasrean section	30 (30%)

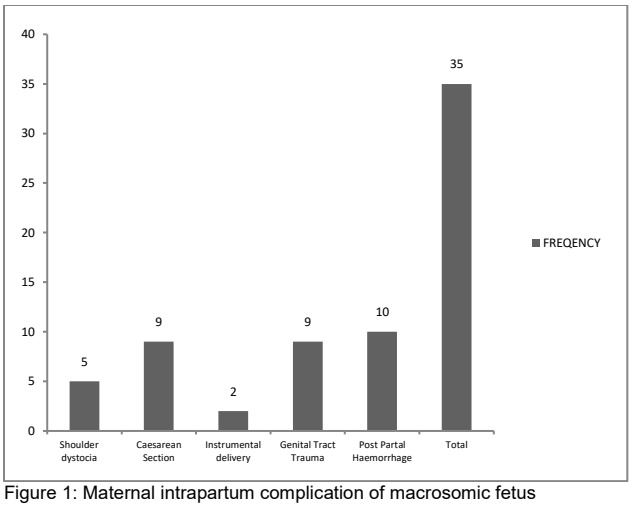

Figure 1: Maternal intrapartum complication of macrosomic fetus

DISCUSSION

In our research, the mode of delivery was analyzed, revealing that 50% of patients had spontaneous vaginal delivery, while 30% had a cesarean section. Sixteen percent of patients had vacuum birth, whereas only four percent experienced forceps delivery; similar findings were reported in the research conducted by Simhayoff N[9]. The incidence of caesarean sections markedly rose among individuals who had labor induction compared to those who did not have induced labour[9]. Fetuses of diabetes mothers are at a heightened risk of damage during vaginal delivery. This study identified 35 maternal intrapartum complications among 100 patients, including 5 (14%) cases of shoulder dystocia, 9 (26%) cases requiring caesarean section, 2 (6%) cases of instrumental delivery, 9 (26%) instances of genital tract trauma, and 10 (29%) occurrences of postpartum hemorrhage. Similar findings were reported in a research conducted by Rhodes JC, which established that macrosomic newborns have an increased risk of shoulder dystocia, brachial plexus damage, skeletal injuries, meconium aspiration, neonatal hypoxia, hypoglycemia, and fetal demise[10]. Maternal problems associated with cephalopelvic disproportion including protracted labor, labor augmentation, cesarean section, postpartum hemorrhage, infection, thromboembolic events, and anesthesia-related incidents. Maternal and baby problems have led to divergent viewpoints on care, with choices being taken intrapartum because to the challenges in forecasting macrosomia[11]. Caesarean sections promise to prevent fetal harm but may lead to heightened maternal morbidity[12]. The optimal way of birth remains contentious, with some data suggesting elective caesarean section[13]. A fetus was determined to have a markedly elevated chance of exceeding a birth weight of 4000 grams when the estimated fetal weight was derived from abdomen circumference rather than from head circumference or femur length[14,15]. The assessment of soft tissue does not surpass clinical or sonographic estimation in detecting a fetus weighing at least 4000 grams. The primary indications for cesarean section in this research were lack of progress in labor and cephalopelvic disproportion. Parity was shown to be significantly correlated with macrosomia. Elective labor induction at or near term has been suggested to mitigate maternal and neonatal problems associated with macrosomia. A research done in Iran indicates that the overall cesarean rate for macrosomia was 22.5%, but our study reports a rate of 30%. An other research conducted by an American family practitioner compared the outcomes of patients with suspected macrosomia prior to birth to those without such suspicion. The author discovered that the likelihood of cesarean section was significantly elevated (52 vs 30) in pregnancies where macrosomia was suspected (17, 18). One objective of this study is to determine the technique of delivery for infants with macrosomia. The rationale

for opting for a cesarean is to avoid resultant difficulties. Berard reported a cesarean section rate of 33.8% and an instrumental delivery rate of 36%.

The results of this research generally align with other others that have linked macrosomia to maternal and newborn morbidity. Healthcare providers managing pregnant patients have a clinical conundrum when dealing with women at term who are believed to be carrying an excessively big baby. Challenges arise due to the inaccuracies in our prenatal estimations of fetal weight; yet, this technology has limits, since ultrasound estimates are accurate within 10% of actual fetal weight only two-thirds of the time. To have an 80% certainty that the actual fetal weight exceeds 4500 grams, the ultrasound measurement must indicate 5000 grams. An skilled examiner's accuracy in predicting fetal weight is comparable to that of ultrasonography. Numerous estimates of the risk of brachial plexus injuries associated with shoulder dystocia are documented in the literature, averaging about 15%. Most of these injuries heal completely; however, around 20% result in some permanent consequences. Consequently, 3% of all instances of shoulder dystocia result in lifelong brachial plexus damage. Numerous physicians choose to perform a cesarean section for newborns of diabetes moms weighing 4200 grams and for non-diabetic infants at 4500 grams. In summary, macrosomia is a considerable clinical challenge, and no universal care strategy will be appropriate for all patients; clinicians must tailor their clinical judgment accordingly. One must be ready for difficulties like shoulder dystocia, since they might arise throughout any birth. In some clinical scenarios, monitoring for spontaneous labour, inducing labor, or performing a caesarean section may all be appropriate care strategies for a woman with a suspected macrosomic fetus. The prevalence of caesarean section was thrice higher in the prior studies[19,20]. The incidence of caesarean section in the research cohort was 40.5%, attributed to the extensive use of cesarean delivery as a method of childbirth. Conversely, some researchers did not see a significant reduction in fetal morbidity and death in macrosomic infants delivered by caesarean section, which undermines the rationale for the high incidence of caesarean deliveries; hence, they recommend early induction at term for mothers of macrosomic infants[21-23].

CONCLUSION

Our study concludes that the frequency of maternal intrapartum complications of macrosomic fetus is high. With increasing in number of diabetes and obesity, the incidence of macrosomia and hance its consequences are increasing. With timely anticipation and managing the complication maternal as well as fetal morbidity can be reduced.

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