

FETOMATERNAL OUTCOME IN PREGNANT WOMEN AT TERM WITH LOW AMNIOTIC LIQUID

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Abstract *To determine the fetomaternal outcome in pregnant women at term with low amniotic liquid. A cross-sectional study was carried out on 120 pregnant women aged 18 to 40 years, gestational age 37 to 40 weeks, and low amniotic fluid < 5 cm on ultrasonography. Fetomaternal outcomes were assessed in all women. Chi-Square test was used for association keeping P value < 0.05 as significant. The mean age was 28.71±6.56 years. Caesarean section was carried out on 65% of patients, a low APGAR score was noted in 61.7% of neonates, low birth weight was seen in 64.2% of neonates, while 15% of neonates required NICU admission. Our study observed that caesarean section, low APGAR score at 5 minutes, low birth weight, and NICU admission are the most commonly associated fetomaternal outcome of the low amniotic fluid index in pregnant women at term.*

Keywords: Neonates, Amniotic fluid index, *fetomaternal*, maternal

Introduction

Pregnancy is a unique and complex physiological process that involves the growth and development of both the mother and the fetus. One critical aspect of a healthy pregnancy is the amniotic fluid, a clear and watery substance that surrounds and protects the fetus in the womb (Rabie et al., 2017). Adequate amniotic fluid levels are essential for proper fetal development and function. However, when pregnant women reach term and are diagnosed with low amniotic fluid levels, it can raise concerns about fetomaternal outcomes (Rossi and Prefumo, 2013). Amniotic fluid plays several crucial roles during pregnancy. It cushions the fetus, allowing it to move and develop its musculoskeletal system without constraint. It also helps maintain a stable temperature and protects against infections. Moreover, amniotic fluid is essential for lung development in the fetus, as it allows the developing lungs to expand and contract. Therefore, when a pregnant woman reaches term and has low amniotic fluid levels, it can significantly impact fetomaternal outcomes (Abdallah et al., 2012; Grace et al., 2012; Munn, 2011). First and foremost, low amniotic fluid levels, a condition known as oligohydramnios, can lead to fetal complications. The reduced cushioning effect of amniotic fluid may increase the risk of cord compression, resulting in fetal distress (Chaudhary et al., 2017). Fetal distress can lead to oxygen deprivation and, in severe cases, fetal demise. Additionally, oligohydramnios can hinder the fetus's ability to swallow and excrete amniotic fluid,

resulting in decreased lung development, potentially causing respiratory problems after birth (Levin et al., 2022; Figueroa et al., 2020).

Maternal outcomes in pregnancies with low amniotic fluid levels are also a concern. Women with oligohydramnios may experience discomfort, such as abdominal pain and tightness, due to reduced cushioning for the fetus (Mousavi et al., 2018). Furthermore, low amniotic fluid levels can increase the risk of complications during labor and delivery. The lack of adequate fluid may hinder the fetus's ability to move through the birth canal, potentially necessitating interventions like vacuum extraction or cesarean section. These interventions carry their own risks and can lead to longer recovery times for the mother (Hughes et al., 2020). It is important to note that the underlying causes of low amniotic fluid levels in term pregnancies can vary. Some common causes include post-term pregnancy, ruptured membranes, placental insufficiency, and medical conditions like preeclampsia (Boma et al., 2022; Bakhsh et al., 2021).

The fetomaternal outcomes in pregnant women at term with low amniotic fluid levels are a matter of concern. Low amniotic fluid levels can lead to fetal distress, respiratory problems, and complications during labor and delivery. Maternal discomfort and an increased risk of interventions also add to the complexity of managing these pregnancies. Early detection and appropriate management are crucial to optimizing outcomes for both the mother and the

fetus. As our understanding of this condition continues to evolve, healthcare providers will strive to improve care and outcomes for pregnant women facing this challenge.

Material and methods

Our cross-sectional study was conducted on a sample of 120 patients who presented with low amniotic fluid at term at the gynecology outpatient department (OPD) of Khyber Teaching Hospital, Peshawar. The study was conducted between March 2022 and September 2022, following the ethical approval from the hospital’s ethical committee. The study comprised women aged 18-40 years, who were in the gestational age range of 37 to 40 weeks, and had low amniotic fluid levels measuring less than 5 cm as determined by ultrasonography. All women were informed about the objectives, advantages, and potential hazards associated with the research. The researchers obtained written consent forms from all female participants who volunteered to participate in the study. Demographic information was documented, including age, gestational age, BMI, and parity. The outcomes seen in the relationship between the fetus and the mother included a caesarean section, a low APGAR score of less than 7 after 5 minutes, neonatal intensive care unit (NICU) admission, and birth weight below 2.5 kg. The objective was to evaluate the outcomes for both the fetus and the mother in these cases. This evaluation was conducted under the supervision of a seasoned consultant with a minimum of five years of experience following their fellowship. A designated form was utilized to document the specific information of each patient. The data underwent analysis using SPSS 24. The Chi Square test assessed the connection between variables, with a

significance level of $P < 0.05$ considered statistically significant.

Results

Mean age of the patients in our study was 28.71 ± 6.56 years. The mean gestational age in our study was 38.40 ± 1.14 weeks. The mean BMI of the patients was 22.78 ± 1.46 kg/m². Regarding parity, we observed that 58 (48.3%) patients had parity 0 to 3 while 62 (51.7%) had parity > 3. The rate of caesarean section in our study was 78 (65%), the rate of low APGAR score noted was 74 (61.7%), NICU admission was needed for around 18 (15%) neonates while low birth weight (< 2.5 kg) was observed in 77 (64.2%) of the neonates. We stratified the outcomes with age and found that caesarean section was associated with increasing age; patients above the age of 30 had a higher frequency of caesarean section than patients between 18 to 30 years ($P = 0.0001$). Neonatal outcomes were significantly associated with age.

Figure 1 Age distribution

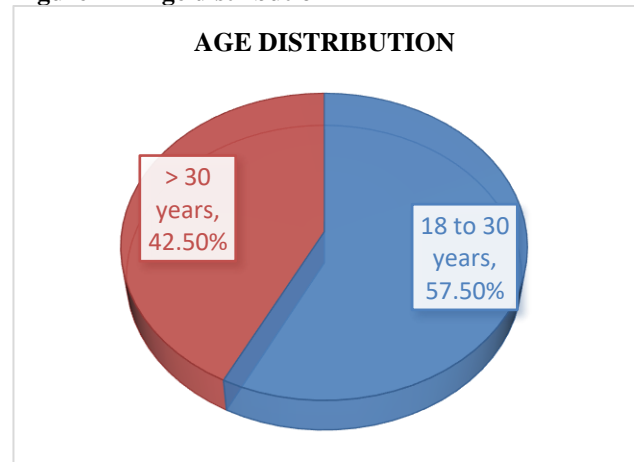


Table 1 Fetomaternal outcome

Fetomaternal outcome	Frequency	Percentage
Caesarean section	78	65.0%
Low APGAR score	74	61.7%
NICU admission	18	15.0%
Low birth weight (< 2.5 kg)	77	64.2%

Table 2 Association of age with fetomaternal outcome

Fetomaternal outcome		Age groups				P value
		18 to 30 years		31 to 40 years		
		Frequency	%	Frequency	%	
Caesarean section	Yes	31	39.7%	47	60.3%	0.0001
	No	38	90.5%	4	9.5%	
Low APGAR score	Yes	39	52.7%	35	47.3%	0.17
	No	30	65.2%	16	34.8%	
NICU admission	Yes	12	66.7%	6	33.3%	0.39
	No	57	55.9%	45	44.1%	
Low birth weight (< 2.5 kg)	Yes	40	51.9%	37	48.1%	0.10
	No	29	67.4%	14	32.6%	

Discussion

Examining fetal health during pregnancy includes a crucial component: measuring amniotic fluid

volume. This assessment involves several criteria, such as the AFI, which is mostly determined using ultrasound technology (Galkwad et al., 2016). The

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method described is widely considered the preferred option for measuring amniotic fluid levels, although the Single Deepest Pocket (SDP) approach is also employed in specific pregnancies. The methodology entails partitioning the uterine cavity into four quadrants of equal size and afterwards calculating the AFI by summing the measurements of the deepest pocket inside each quadrant. Amniotic fluid index (AFI) measurements lying between 5-24 cm are within the normal range. However, AFI readings over 24 cm indicate the presence of Hydramnios, whereas measurements below 5 cm indicate Oligohydramnios (Jamal et al., 2016). Evidence suggests a correlation between reduced AFI levels and negative fetal outcomes, encompassing meconium staining, congenital abnormalities, growth retardation, fetal dysmaturity, and fetal hypoxia. However, it is important to acknowledge that several research has proposed that AFI may not be an ideal indicator for predicting negative perinatal outcomes. These studies underline the importance of evaluating numerous indicators when assessing the well-being of the fetus and mother throughout the perinatal period (Bachhay and Waikar, 2014).

The assessment of amniotic fluid volume is of great significance in assessing fetal well-being. It has implications for decisions regarding fetal distress, meconium aspiration, the choice of delivery method (including the consideration of cesarean section), and infant mortality (Phelan et al., 1987). The utilization of ultrasound technology to estimate the volume of amniotic fluid, namely through the measurement of AFI, has been widely recognized as a dependable approach for evaluating placental function. The quantity of amniotic fluid demonstrates fluctuations during pregnancy, eventually stabilizing within specific gestational weeks. Generally, the amount settles at around 700-800 ml, corresponding to an AFI of approximately 14-15 cm. Fluctuations beyond this specified range, regardless of whether there is an elevation or reduction in the quantity of amniotic fluid, can give rise to difficulties throughout pregnancy (Bachhay and Waikar, 2014). Various research has a range of viewpoints about the interpretation of borderline AFI (amniotic fluid index) values. Additionally, there is a diversity of attitudes concerning the clinical importance of these values and their potential impact on the health outcomes of both the mother and the fetus, as well as the medical measures implemented to promote fetal well-being (Akhter et al., 2010; Monir et al., 2015). Moreover, based on a study, there seems to be a lack of substantial disparity in the occurrence of fetal distress or neonatal mortality between pregnancies characterized by borderline AFI values and those with AFI values within the normal range. Nevertheless, it was observed that the incidence of cesarean birth was comparatively elevated in the

group mentioned above. On the other hand, certain studies propose that oligohydramnios, characterized by a decrease in the volume of amniotic fluid, does not significantly impact the ability to forecast pregnancy outcomes (Sharif and Qasim, 2021). We conducted our study on 120 women presenting at term with low amniotic fluid; we assessed the fetomaternal outcome. The mean age of our patients at presentation was 28.71 ± 6.56 years while the gestational age was 38.40 ± 1.14 weeks. A study showed similar demographics, the mean age in their study was 28.92 ± 4.45 years, while the mean gestational age was 38.31 ± 1.20 weeks (Akhter et al., 2010; Monir et al., 2015). Regarding the fetomaternal outcome, we observed that 65% had caesarean section, a low APGAR score at 5 minutes was seen in 61.7% of neonates, NICU admission was required for 15% of neonates while 64.2% of neonates were born with low birth weight. Our results are similar to the study as mentioned earlier which was conducted in Pakistan; they reported that cesarean section was found in 66.67% of patients, low APGAR score at 5 minutes at 62.22%, low birth weight 64.44%, and NICU admission was needed in 18.89% of patients (Sharif and Qasim, 2021). A study conducted in India to assess the fetomaternal outcome in borderline AFI vs normal AFI reported that the number of caesarean sections was significantly higher in the borderline AFI group, which supports our findings. They also reported that the incidence of low APGAR score at 5 minutes, low birth weight, and NICU admission were significantly higher in the borderline AFI group than the controls (Vyas et al., 2021).

Conclusion

Our study concludes that caesarean section, low APGAR score at 5 minutes, low birth weight, and NICU admission are the most commonly associated fetomaternal outcome of a low amniotic fluid index in pregnant women at term. We propose that it is imperative to implement thorough antenatal management protocols for these individuals at high risk as a means to mitigate fetal morbidity and mortality.

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Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

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Not applicable

Conflict of Interest

Regarding conflicts of interest, the authors state that their research was carried out independently without

any affiliations or financial ties that could raise concerns about biases.



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