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ORIGINAL ARTICLE

Assessment of Neonatal complications in control group and study group with low amniotic fluid index at term

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ABSTRACT:
Introduction: In light of the information mentioned above, this study aimed to determine if oligohydramnios can be utilised as an indicator of negative perinatal outcomes in uncomplicated full-term pregnancies. **Materials & Methods:** The ladies were separated into control and study groups according to AFI. AFI was assessed using the four-quadrant method. Women having AFI below the 5th percentile, specifically AFI less than 5 cm at term according to Phelan's definition of oligohydramnios, or an amniotic fluid volume of less than 500 mL after 37 weeks of pregnancy, were included in the study group. **Results:** The proportion of patients with a gestational age more than 40 weeks was 37% in the control group and 48% in the study group. The average AFI in the control group was 11.31 cm, while in the research group it was 5.30 cm. **Conclusion:** Considering the negative effects observed in patients with borderline AFI and the lack of clear evidence and specific guidelines regarding delivery for borderline AFI, it is important to closely monitor and do antepartum surveillance for these patients.
Keywords: Prenatal, low amniotic, fluid index, full term pregnancy

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INTRODUCTION

Amniotic fluid is a crucial aspect of pregnancy that has a significant impact on the fetus's natural growth, as well as the development of muscles and bones, and facilitates easier mobility of the foetus. Assessing the amniotic fluid is a crucial aspect in evaluating the health of the foetus in relation to issues such as foetal discomfort, meconium aspiration, caesarean delivery, and foetalmortality.Considering the negative effects observed in patients with borderline AFI and the lack of clear evidence and specific guidelines regarding delivery for those with borderline AFI, it is recommended to closely monitor and do antepartum surveillance for these patients.[1]The evaluation of amniotic fluid volume is extremely important for the well-being of the foetus, and the Amniotic Fluid Index (AFI) is the most often used method to estimate amniotic fluid volume, which is done using ultrasonography.[2]Research has shown that AFI is a reliable measure for determining sufficient placental function.[3]The amount of amniotic fluid changes as the pregnancy progresses, reaching a stable level between 22-39 weeks of pregnancy. At this stage, the volume of amniotic fluid is around 700-800 ml, which is equivalent to an AFI (Amniotic Fluid Index) of 14-15 cm. [4]Any reduction or augmentation in the amount of amniotic fluid results in pregnancy problems.[1] Oligohydramnios is often defined as an AFI of 5 cm or below in most research, and its related complications for both the mother and foetus have been established.[5]Nevertheless, there are varying opinions regarding the extent of borderline AFI. In a study conducted by Phelan et al, borderline AFI is classified as ranging from 5 to 8 cm.[5]

In pregnancies that go longer than 40 weeks, the occurrence may exceed 12% due to a gradual decrease in the amount of amniotic fluid beyond 41 weeks of gestation.[6]Women who have oligohydramnios are more prone to have aberrant or non-reactive foetal heart rate tracings, a higher occurrence of foetal distress, and consequently a greater likelihood of undergoing caesarean sections.[7]Oligohydramnios is also the primary reason for initiating labour induction. Labour induction raises the likelihood of caesarean delivery, especially for first-time mothers with a cervix that is not yet ready for childbirth.[8]Oligohydramnios is linked to a high occurrence of pregnancy difficulties and higher risk of perinatal health problems and death. Therefore, AFI-evaluated antepartum or intrapartum could assist in identifying women who require enhanced antepartum monitoring for pregnancy problems.[9]Nevertheless, certain studies indicate that AFI is not a reliable indicator of negative perinatal fate, and isolated oligohydramnios should not be the sole factor in predicting perinatal outcome.[10]In light of the information mentioned above, this study aimed to determine the neonatal complications.

MATERIALS AND METHODS

The study received ethical approval from the institute's ethical committee before it began. The research was carried out on women who were selected from the outpatient department and the labour ward.

The eligibility requirements for the trial were being pregnant between 37 and 40 weeks of gestation without any known obstetric or medical issues. The criteria for exclusion were the occurrence of obstetric or medical issues and a lack of motivation to participate in the study. A grand number of 140 women were chosen. The ladies were separated into control and study groups according to AFI. AFI was assessed using the four-quadrant method. Women having AFI below the 5th percentile, namely an AFI of less than 5 cm at term according to Phelan's definition of oligohydramnios, or an amniotic fluid volume of less than 500 mL after 37 weeks of pregnancy, were included in the study group.

Patients diagnosed with oligohydramnios were monitored until they arrived in our labour room in active labour or were admitted to the labour room through the OPD for other reasons. NST was performed for all the patients upon admission. Individuals who had a non-reactive non-stress test (NST) and were not in active labour also had a biophysical profile (BPP). Records of obstetric procedures such as labour induction or augmentation with prostaglandins or pitocin, as well as the method of delivery, were documented. Recording of neonatal results, such as birth weight and APGAR score, was also conducted. Admission to the neonatal unit was recorded for perinatal conditions such as APGAR scores below 7, seizures, low blood sugar, low body temperature, high levels of bilirubin, low levels of calcium, meconium aspiration, respiratory problems, and perinatal death.

The data was statistically analysed using SPSS version 11.0 for Windows. Chi-square and Student's t-test were employed to assess the statistical significance of the data. A p-value of 0.05 or lower was considered to be statistically significant.

RESULTS

Table 1 displays the demographic characteristics of both the study and control groups. The research and control groups each had 70 people. The proportion of patients with a gestational age greater than 40 weeks in the control group was 37%, while in the trial group it was 48%. The average AFI in the control group was 11.31 cm, while in the research group it was 5.30 cm.

Table1: Demographics of study and control group

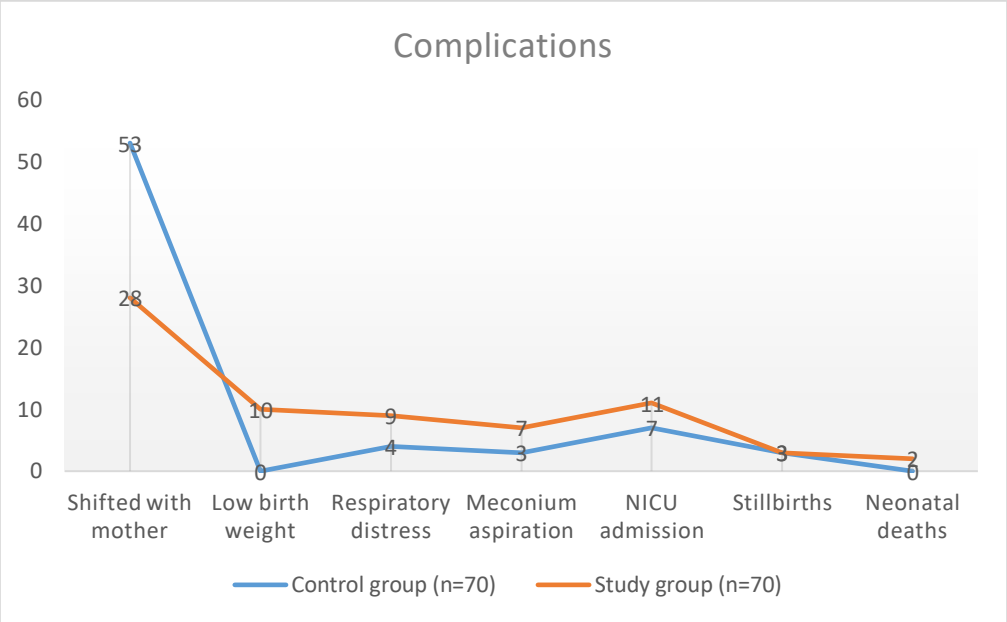
Variables	Control group	Study group
Number of participants	70	70
Percentage of patients at gestational Age >40 weeks	46	58
Mean AFI (cm)	11.31	5.30

Table 2 displays neonatal problems in both the control group and the trial group. We saw that a larger number of newborns were transferred with their mothers in the control group. Likewise, additional difficulties were more frequent in the study group when compared to the control group. In the study group, the most often seen condition was admission to the neonatal intensive care unit (NICU), followed by low birth weight and respiratory distress.

Table2: Neonatal complications in control group and study group

Neonatal complications	Control group(n=70)	Study group(n=70)	p-value
Shifted with mother	53	28	0.004
Low birth weight	0	10	
Respiratory distress	4	9	
Meconiumaspiration	3	7	
NICU admission	7	11	
Still births	3	3	
Neonatal deaths	0	2	

Graph 1: Complications



DISCUSSION

Study group patients were most frequently seen to be admitted to the NICU. The results showed a significant statistical difference. The results were compared to prior studies and were determined to be in line. Jamal A and colleagues investigated the negative effects on pregnancy outcomes in cases where the amniotic fluid index (AFI) was borderline. Pregnant women (37-40 weeks) who were diagnosed with borderline AFI between December 2012 and August 2014 were identified. Pre-birth, during birth, and newborn information were gathered and compared to that of pregnant women with typical AFI. A borderline AFI was described as an AFI measuring less than 8 cm and greater than 5 cm. Pregnancy results included Caesarean section due to a foetal heart rate that was not reassuring, amniotic fluid stained with meconium, an Apgar score of less than 7 at 5 minutes, low birth weight, umbilical cord blood pH at term, and admission to the neonatal intensive care unit. Gestational age at delivery in pregnancies with borderline amniotic fluid index (AFI) was considerably lower than in pregnancies with normal AFI. The rate of caesarean surgery for non-reassuring foetal heart rate in women with borderline amniotic fluid index (AFI) was noticeably higher, and there was a greater occurrence of birth weight below the 10th percentile for gestational age in the borderline AFI group. The occurrence of poor Apgar score and low umbilical artery pH in pregnancies with borderline AFI was considerably more than in mothers with normal AFI. There were no notable variations in the rate of NICU admission and meconium staining in both groups.

In recent studies, there was no notable variation in the occurrence of respiratory distress between the two groups. However, a notable distinction was observed among patients with a gestational age ranging from 28 to 32 weeks, which may be attributed to premature births in this particular group. In addition, several studies have shown higher rates of respiratory distress in newborns with borderline AFI. This may be due to the fact that borderline AFI was assessed at an earlier stage of pregnancy, leading to an association with prematurity and subsequent respiratory distress.[11,12]

The current investigation found no significant variations in the ratios of gravidity and parity between the two study groups. In contrast, the groups in the studies conducted by Gumus et al and Voxman et al were comparable in terms of maternal age, gravidity, and parity.[12,13]Moreover, the current study analysis revealed that there were no notable disparities between the two groups in relation to elevated blood pressure, pre-eclampsia, and diabetes among the mothers. This finding aligns with the outcomes reported by Gumus et al. However, a noticeably greater proportion of patients with normal AFI were admitted to the NICU compared to those with oligohydramnios. That seems to be due to the greater number of women with diabetes in the normal AFI group. Subsequent review of their data, after excluding the diabetic individuals, showed no significant difference between the two groups.[13]

Locatelli A et al examined the impact of oligohydramnios on perinatal results in uncomplicated pregnancies lasting between 40.0 and 41.6 weeks. Between January 1997 and December 2000, all pregnancies without complications that lasted 40.0 weeks with a single non-malformed foetusand accurate dates were monitored. This monitoring involved regularly measuring the amniotic fluid index (AFI) and doing a biophysical profile. Labour was initiated for AFI of 5 cm or fewer, biophysical profile score of 6 or lower, increase in maternal blood pressure above 140/90 mm Hg, or gestational age of 42.0 weeks. Perinatal outcome was compared between

instances with amniotic fluid index (AFI) less than or equal to 5 cm and those with AFI greater than 5 cm. Three thousand and forty-nine women satisfied the inclusion criteria, 341 of whom (11%) had an AFI of 5 cm or less. The time of pregnancy at delivery, rates of not having given birth before, and the use of medical methods to start labour were noticeably different between patients with low amniotic fluid levels and those with a normal amount of amniotic fluid. Rates of caesarean delivery for non-reassuring foetal testing and of neonates with birth weight below the 10th percentile were noticeably higher in the AFI less than or equal to 5 cm group compared to the AFI greater than 5 cm group. There were no notable distinctions seen between the two groups in terms of the occurrence of meconium-stained amniotic fluid, 5-minute Apgar score less than 7, or umbilical artery pH less than 7. The researchers found that in straightforward pregnancies between 40.0 and 41.6 weeks, having too little amniotic fluid is linked to a greater chance of having a low birth weight percentile. Sultana S et al assessed the precision of antepartum Amniotic Fluid Index (AFI) of ≤ 5 cm as a forecaster of unfavourable outcome at birth in high-risk pregnancies. A total of one hundred pregnant women at full term gestation were examined. Every woman at full term with a low AFI of 5 cm or less who was referred for delivery either through the emergency room or outpatient department was identified as being at risk for a negative outcome. The next pregnant woman at full term with the same pregnancy issue but an AFI greater than 5 cm was identified as having a positive prediction for a good outcome at birth. The participants in both groups were demographically similar and met the criteria for inclusion and exclusion. The Apgar score was determined 5 minutes after birth. The infants, with an Apgar score of less than or equal to 6 at 5 minutes after birth, were classified as having a medical condition, while those with a score more than 6 were classified as being in good health. AFI was compared to the Apgar score using Chi-square analysis, and a p-value was determined to assess the statistical significance. The sensitivity, specificity, efficiency, and predictive values of AFI at a cutoff point of ≤ 5 cm as a predictor of adverse outcome at birth (Apgar score of ≤ 6 at 5 minutes of birth) in high-risk pregnancy were calculated. Out of the 50 mothers with low AFI, only 8 newborns had a low Apgar score. Likewise, 6 newborns out of 50 women with normal AFI had a low Apgar score.

CONCLUSION

Considering the negative effects observed in patients with borderline AFI and the lack of clear evidence and specific guidelines regarding delivery for patients with borderline AFI, it is recommended to closely monitor and do antepartum surveillance for these individuals. Additionally, additional research with a prospective design are necessary.

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