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RESEARCH ARTICLE

Pregnancy outcome in pregnant women with oligohydramnios at term pregnancy

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ABSTRACT

Objective: The aim of the study was to assess the pregnancy outcome in pregnant women with oligohydramnios at term pregnancy. **Materials and Methods**: This is a prospective, case-control study which was conducted at Silchar Medical College and Hospital over a period of one year from July 2016 to June 2017. It included 140 pregnant women at term pregnancy with amniotic fluid index ≤ 5cm. The control group included 200 pregnant women at term pregnancy with amniotic fluid index > 5cm. The two groups were compared. Statistical analysis was done using the Fisher's exact test to calculate the P value. **Results**: There was a significantly higher incidence of low fetal biophysical profile, induction of labour, overall caesarean rates and caesarean due to non-reassuring fetal status, fetal distress, low birth weight babies, 5 minute Apgar score ≤ 6, neonatal intensive care unit (NICU) admission rates, hypothermia, meconium aspiration syndrome and perinatal death in the group with oligohydramnios as compared to the group with normal liquor volume. The incidence of instrumental delivery, fetal congenital anomaly, hypoglycaemia, hypoxic ischaemic encephalopathy, neonatal jaundice was higher in the oligohydramnios group but was not statistically significant. **Conclusion**: Oligohydramnios adversely affects the perinatal outcome. However, a favourable outcome can be expected by good antepartum and intrapartum surveillance and neonatal care.

Keywords: Pregnancy outcome, term pregnancy, amniotic fluid index.

The fetus, during its intra-uterine life remains inside the amniotic cavity which is filled with amniotic fluid or liquor amnii. This clear fluid helps to maintain the warmth, has a cushioning effect protecting the fetus from trauma and allows free movement of the fetus. Liquor volume increases in amount as pregnancy progresses up to 36 weeks, and thereafter gradually decreases. The maintenance of liquor volume is the result of interaction of fetal, placental and maternal factors as all of them contribute to its formation. Quantitative and qualitative alterations of the amniotic fluid complicate 7% of all pregnancies [1]. Oligohydramnios is a term used for deficiency in the amount of amniotic fluid. Its definition varies based on the criteria used. A single maximum vertical pocket depth of liquor volume measuring less than 3 cm [2] and amniotic fluid index less than or equal to 5 cm [3] are commonly followed definition of oligohydramnios. Various fetal anomalies, particularly involving the genitourinary tract, intrauterine growth retardation, post term pregnancy, premature rupture of

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membrane, intrauterine fetal death, conditions leading to placental insufficiency such as pre-eclampsia, chronic hypertension, diabetic vasculopathy, placental abnormalities or unknown causes may contribute to oligohydramnios, which may lead to serious effects like fetal pulmonary hypoplasia, limb deformities and fetal distress or fetal death.

Ultrasonography has emerged as an important aid in modern obstetrics. Besides assessment of liquor volume, the underlying etiology of altered volume may also be sometimes determined. Appropriate and prompt management of these cases following timely diagnosis may help to modify the fetal outcome to a great extent.

The present study was to taken up to evaluate and compare the pregnancy outcome in relation to normal and decreased liquor volume at term pregnancy.

Materials and Methods

The present study was carried out in the department of Obstetrics and Gynaecology, Silchar Medical College and Hospital over a period of one year from July 2016 to June 2017. It is a prospective case control study. Informed consent was taken from all individual participants included in the study. A total of 340 women with singleton term pregnancies admitted in antenatal or emergency ward were studied of which 200 had normal liquor volume and 140 had oligohydramnios, as diagnosed by ultrasonography. The women were grouped into two divisions-

- Group A - Cases with normal liquor volume (amniotic fluid index > 5 cm).
- Group B - Cases with oligohydramnios (amniotic fluid index ≤ 5 cm).

Inclusion criteria for the study participants were pregnant women with singleton pregnancy at 37 to 40 weeks of gestation with reduced and normal liquor volume in cephalic presentation, with intact membrane, no known maternal medical diseases, no contraindication for vaginal delivery (like macrosomia, placenta praevia, post- caesarean pregnancy) and delivery within a week of determining the AFI.

A B mode real time ultrasonography was done in each woman. The mode of labour onset, intrapartum monitoring, and mode of delivery was noted. After delivery, the status of the baby including Apgar score, need for ICU care, birth weight, presence of congenital anomalies and any other neonatal complications were noted and compared within the two groups.

Statistical analysis was done to estimate the P value using Fisher's Exact test for the qualitative variables comparing the outcome in the two groups of women. P< 0.05 was assumed as significant.

Results

A total of 340 women were studied in the present study of which 200 had normal liquor volume (Group A - control) and 140 had oligohydramnios (Group B) as diagnosed by ultrasonography done beyond 37 weeks of gestation. Table 1 shows the baseline characteristics.

Table 1: Baseline characteristics

Categories		Group A (N=200) Number (%)	GroupB(N=140) Number (%)
Age in years	<20	55(27.5%)	40(28.6%)
	20 – 30	140(70%)	87(62.1%)
	>30	5(2.5%)	13(9.3%)
Gravidity	Primi	106(53%)	75(53.6%)
	Multi	94(47%)	65(46.4%)

Low fetal biophysical profile score as shown in table 2 was significantly higher in group B (oligohydramnios) compared to Group A (normal liquor volume).

Table 2: Showing fetal biophysical profile score, modes of onset of labour and modes of delivery

Categories		GroupA(N=200) Number (%)	Group B (N=140) Number (%)	P value
Biophysical profile	≤ 4	5(2.5%)	44(31.4%)	
	≥ 6	195(97.5%)	96(68.6%)	
Modes of labour onset	Spontaneous	140(75%)	62(44.3%)	
	Induced	50(25%)	52(37.1%)	0.0164
	Elective caesarian	10(5%)	26(18.6%)	
Modes of delivery	Spontaneous	150(75%)	46(40%)	
	Instrumental	10(5%)	14(10%)	0.07672
	Caesarian	40(20%)	70(50%)	
CS for non reassuring fetal status		15(7.5%)	38(27.1%)	

The labour events as demonstrated in table 2 shows that the labour induction rates, the overall caesarean section rates as well as caesarean section due to non-reassuring fetal status was significantly higher in the group with oligohydramnios.

Table 3: Perinatal outcome

Categories	Group A (N=200) Number (%)	Group B (N=140) Number (%)	P value
Intrapartum fetal distress	15(7.5%)	38 (27.1%)	
Fetal birth weight <2.5 Kg	12(6%)	42(30%)	0.00024
5 minute Apgar score ≤ 6	10(5%)	30(21.4%)	
NICU admission	6(3%)	36(25.7%)	
Hypothermia	4(2%)	15(10.7%)	0.00058
Hypoglycemia	2(1%)	5(3.6%)	0.101
MAS	5(2.5%)	14(10%)	0.00058
HIE	1(0.5%)	4(2.9%)	0.07508
Neonatal Jaundice	8(4%)	12(8.6%)	0.0784
Fetal congenital anomaly	-	1(0.7%)	
Perinatal death	2(1%)	12(8.6%)	0.00054

NICU – Neonatal intensive care unit, MAS – Meconium aspiration syndrome, HIE – Hypoxic ischemic encephalopathy

The perinatal outcome has been shown in table 3. It was noted that poor perinatal outcome which included fetal distress, low fetal birth weight, 5 minute Apgar score ≤ 6, NICU admission rates, neonatal hypothermia, meconium aspiration syndrome and perinatal deaths were significantly higher in group B (oligohydramnios) as compared to group A(normal liquor volume).

Discussion

Liquor volume influences the perinatal outcome both in terms of morbidity and mortality. Complications like intrauterine growth retardation, meconium aspiration syndrome, birth asphyxia, compression deformity are higher in oligohydramnios. Most cases of oligohydramnios are due to premature rupture of membrane, other causes are fetal abnormalities such as urinary tract malformation or chromosomopathies and drugs e.g. NSAIDS [1]. AFI ≤ 5 cm in early intrapartum period is a risk factor for perinatal morbidity and abnormal fetal heart rate pattern in subsequent labour [4].

In the present study, low fetal biophysical profile was significantly associated in the group with oligohydramnios in comparison to the group with normal liquor volume. Variable deceleration was significantly more often found in association with oligohydramnios in a study [5]. Higher fetal deceleration was also noted in another study done by Chate P, et al [6]. Labour was spontaneous in onset in 70% versus 44.3% women, induced in 25 % versus 37 % women whereas elective Caesarean section was done 5% versus 18.6 % women in group A (normal liquor volume) and group B (oligohydramnios) respectively. Isolated oligohydramnios associated with higher rates of induction were found in the studies of Ashwal E et al[7], Elsandabese D et al[8] and Rainford M et al [9].

Vaginal delivery occurred spontaneously in 75% versus 40% women, instrumental vaginal delivery occurred in 5% versus 10% women, whereas caesarean section was done in 20% versus 50% women. Increased overall operative vaginal delivery rates and those for non reassuring fetal status were demonstrated by Manzanaras S et al[10]. Overall higher caesarean rates in oligohydramnios were noted in the studies of Elsandabese D et al[8], Manzanaras S et al[10] and Bachhav AA et al[11]. Oligohydramnios was found to be associated with increased risk of caesarean section due to fetal distress in a number of studies [7,10,12]. This association was significant in the studies of Chate P et al [6], Chauhan SP et al[13] and Alchalabi HA [14]. Conway DL[15] has demonstrated increased caesarean rates amongst women induced for isolated oligohydramnios, but that was not attributable more fetal distress. Rainford M et al says oligohydramnios does not appear to affect operative delivery for abnormal fetal heart rate tracing [9].

Incidence of fetal distress was significantly higher in the group with oligohydramnios in the present study which is comparable to the study of Chate P et al [6]and Ashwal E et al[7]. Banks EH et al[16] has shown two fold increased incidence of intrapartum fetal distress among women with borderline amniotic fluid volume compared to control subjects with normal amniotic fluid volume. Significant higher incidence of meconium stained amniotic fluid following induction of labour at term in patients with oligohydramnios was demonstrated in the study of Alchalabi HA et al[14]. But this association was not significant in the studies done by Baron C et al [5], Jamal et al [17] and Blackwell SC et al[18].

A fivefold increased incidence of low birth weight babies in the oligohydramnios group was noted in the present study. Several other studies have shown strong association between oligohydramnios and small for gestational age fetus [6,11,16,17,19,20,21]. No significant difference in mean birth weight and incidence of low birth weight babies was observed in the study of Chauhan SP et al [13].

The NICU admission rates in our study were significantly higher in the group with oligohydramnios. Higher NICU admission rates were observed in the studies of Chate P et al [6] and Ashwal E et al[7]. No significant differences in the rate of admission to NICU were seen in several studies [9,13,14,17].

Low 5 minute Apgar score in neonates born to women with oligyhydramnios was found in several studies [6,7,11,12,16]; the association was significant in the study of Jamal et al [17] as in ours. However in some studies [5,9,13,14], Apgar score was not found to be affected by presence of reduced liquor volume.

Isolated oligohydramnios at term was found to be associated with higher rates of meconium aspiration syndrome and hypoxic ischaemic encephalopathy in the new born in the study of Ashwal E et al[7] similar to our study. The perinatal morbidity was not found to be affected in women undergoing induction of labour for oligohydramnios at term in several studies [8,10,15,20]. No differences in neonatal complication between the oligohydramnios group and control group had been shown in the study of Jamal et al [17].

Higher incidence of congenital anomaly was seen in the study as in the study of Chate P et al [6]; the association was found to be significant in the study of Chamberlain PF et al [19].

The perinatal death was significantly higher in the oligohydramnios group in the present study. Gross and corrected perinatal mortality in association with normal qualitative amniotic fluid volume ranged from 4.65/1000 and 1.97/1000 respectively; 187.5/1000 and 109.4/1000 in decreased qualitative amniotic fluid volume respectively in the study of Chamberlain PF et al [19]. Strong association between oligohydramnios and fetal mortality was demonstrated in a meta-analysis of 43 studies involving 244493 fetus by RK Morris et al [21]. Higher neonatal mortality was demonstrated by Chate P et al [6] but was not statistically significant.

The contradictory results with some of the studies can be explained by differences in study design and patient selection as also obstetrician's decision for intervention. The limitation of the study is that the outcome has not been defined in terms of the severity of oligohydramnios.

Conclusion

Oligohydramnios at term pregnancy has an adverse effect on the perinatal outcome. Ultrasonography should be utilized for early detection, monitoring and management of women with reduced liquor volume. Antepartum fetal assessment tests, intensive intrapartum monitoring coupled with timely intervention, a competent neonatologist and neonatal intensive care unit facility can definitely ensure a better perinatal outcome.

Conflict of interest: None. **Disclaimer:** Nil.

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