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Perinatal outcome associated with oligohydramnios in third trimester

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Abstract

Objective: To compare the outcomes of term gestations with oligohydramnios in the absence of other underlying disorders and term gestations with normal amniotic fluid.

Methods: This case-control prospective study was conducted at SMGS hospital Jammu for a period of 6 months from 17 October 2018 to 18 April 2018. In this study, 300 singelton pregnant females with gestational age from 34-40 weeks with intact membranes and no associated pregnancy-induced hypertension, DM and fetal congenital abnormalities were analysed for pregnancy and perinatal outcome. Pregnant females were divided in two groups. 100 consecutive pregnant females with AFI ≤ 5cm at term were included in group A and 200 women with AFI ≥ 5cm and ≤ 20cm were included in group B. The results were statistically analysed using parameters like mean, standard deviation and chi square test and p value <0.05 was taken as statistically significant.

Results: Mean maternal age in group A and group B was 24.1±2.3 and 23.8±2.2 (in years) respectively. 65 females (65%) in group A and 116 females (58%) in group B were nulliparous. Mean gestational age in group A and group B was 37.75±1.9 and 38.25±2.7 (in weeks) respectively. Comparing the pregnancy outcomes, 25 patients (25%) in group A while 16 patients (8%) in group B had nonreactive CTG tracings, 15 patients (15%) in group A and 8 patients (4%) in group B had abnormal doppler parameters. In group A, 38 patients (38%) delivered by caesarean, 6 patients (6%) delivered instrumentally, while in group B, 40 patients (20%) delivered by caesarean, 8 patients (4%) delivered instrumentally. 4 still births (4%) in group A and 1 still birth (0.5%) in group B were noted whereas 23 (23%) NICU admissions in group A and 19 (9.5%) NICU admissions in group B were noted respectively.

Conclusion: Oligohydramnios is associated with adverse perinatal outcome, more chances of caesarean deliveries.

Introduction

Amniotic Fluid (AF) is an important part of pregnancy sac and helps fetal development. Amniotic Fluid has a number of prominent functions like protects the fetus from trauma and infections by bacteriostatic property, maintains body temperature and development of musculoskeletal system by permitting fetal movements growth and development of intestinal tract by swallowing amniotic fluid and it provides essential nutrients to fetus [6]. Amniotic

fluid volume increases from 30ml at 10 weeks to 200ml by 16 weeks and reaches 800ml by mid-third trimester [6]. Oligohydramnios, a deficiency in the amount of amniotic fluid, occurs in 3.9-5.5% of all pregnancies [13].The prevalence depends largely upon the definition and criteria used for oligohydramnios and the population studied [8]. Over past decades, a number of sonographic methods are used to measure the amount of amniotic fluid. Phelan and colleagues (1987) described quantification using aniotic fluid index – AFI [11]. Marks and Divon (1992) found oligohydramnios defined as an AFI of 5cm or less [9]. Some authors state that such pregnancies are at an increased risk of adverse perinatal outcome such as fetal distress in labor, induction of labor, cesarean delivery for fetal distress, meconium passage, low Apgar score and neonatal resuscitation or neonatal intensive care unit admission [1][2][3]. The objective of this study was to determine the association of isolated oligohydramnios at third trimester with adverse perinatal outcome.

Material methods

This case-control prospective study was conducted at SMGS hospital Jammu for a period of 6 months from 17 October 2018 to 18 April 2018. In this study, 300 pregnant females were divided to two groups. 100 consecutive pregnant women with AFI ≤ 5cm at term were included in group A and 200 women with AFI ≥ 5cm and ≤ 20cm were included in group B. Inclusion criteria were women with singleton pregnancy with cephalic presentation, non-anomalous baby who had completed the 34 weeks of gestation and with intact membrane. Similarly, we excluded the women with <34 weeks of gestation, women with ruptured membrane, multiple pregnancy, and pregnancy-induced hypertension, DM and fetal congenital abnormalities from the study. Both groups were matched for age, parity and gestational age. After selection of cases, detailed history was taken, examination was done and data was recorded on a Performa which covered the personal and clinical information for each patient. Various outcome measures recorded were pregnancy outcome including gestational age at delivery, FHR tracings (CTG tracings), abnormal Doppler parameters, mode of delivery and perinatal outcomes including Apgar score at one minute and five minutes, admission to Neonatal Intensive Care Unit (NICU), still birth and perinatal mortality. The results were statistically analysed using parameters like mean, standard deviation and chi square test and p value <0.05 was taken as statistically significant.

Results

300 pregnant females divided in two groups. 100 consecutive pregnant women with AFI ≤ 5cm at term were included in group A and 200 women with AFI ≥ 5cm and ≤ 20cm were included in group B. Mean maternal age in group A and group B was 24.1±2.3 and 23.8±2.2 (in years) respectively. 65 females (65%) in group A and 116 females (58%) in group B were nulliparous. Mean gestational age in group A and group B was 37.75±1.9 and 38.25±2.7 (in weeks) respectively.

Table 1: Maternal Demography

	Group A(AFI <5)(N=100)	Group B(AFI >5)(N=200)	P value

Mean maternal age	24.1±2.3	23.8±2.2	0.274
Mean gestational age	37.75±1.9	38.25±2.7	0.098
Nulliparity	65	116	0.243

Comparing the pregnancy outcomes, 25 patients (25%) in group A while 16 patients (8%) in group B had nonreactive CTG tracings which is statistically significant. 15 patients (15%) in group A and 8 patients (4%) in group B had abnormal doppler parameters. In group A, 38 patients (38%) delivered by caesarean, 6 patients (6%) delivered instrumentally, 44 patients (44%) had vaginal (unassisted) delivery while in group B, 40 patients (20%) delivered by caesarean, 8 patients (4%) delivered instrumentally, 152 patients (76%) had vaginal delivery (unassisted).

Table 2: Pregnancy Outcome

	Group A (AFI<5) (N=100)	Group B (AFI>5) (N=200)	P value
Nonreactive CTG	25	16	<0.001*
Abnormal Doppler parameters	15	8	0.0007*
Instrumental delivery	6	8	0.439
Caesarean delivery	38	40	0.0008*

*statistically significant difference (p value<0.05)

Comparing the perinatal outcomes, 20 babies (20%) in group A and 18 babies (9%) in group B had APGAR score at 1min <7, 6 babies (6%) in group A and 7 babies (3.5%) in group B had APGAR score at 5min <7 respectively. 4 still births (4%) in group A and 1 still birth (0.5%) in group B were noted whereas 23 (23%) NICU admissions in group A and 19 (9.5%) NICU admissions in group B were noted respectively, which was statistically significant.

Table 3: Perinatal Outcome

	Group A (AFI<5) (N=100)	Group B (AFI>5) (N=200)	P value
APGAR score at 1min <7	20	18	0.006*

APGAR score at 5min <7	6	7	0.316
Still birth	4	1	0.043*
NICU admission	23	19	0.002*

*statistically significant difference (p value<0.05)

Discussion

The study results analysis demonstrate that oligohydramnios is associated with increased chances of nonreassuring fetal heart rate and nonreactive CTG (25% Vs 8%), abnormal doppler parameters (15% Vs 4%), caesarean delivery (38% Vs 20%) which was statistically significant difference ($p<0.05$) whereas there is no increased chances of instrumental delivery (6% Vs 4%) with $p=0.439$.

The results are favoured by a study by Rutherford et al [12] which concluded that an antepartum amniotic fluid index of ≤5.0 cm, in comparison with >5.0 cm, is associated with an increased risk of cesarean delivery for fetal distress and an Apgar score of <7 at 5 minutes.

The non-reactive CTG, cesarean section rate due to fetal distress, low birth weight, APGAR score <7 and NICU admission were significantly high among those with oligohydroamnios than the control group according to Panda et al [10].

Oligohydramnios increases the incidence of caesarean delivery for fetal distress, NICU admission, low apgar at 5 mins and Neonatal death according to Grub et al [7].

Regarding perinatal outcome, the study results demonstrate that oligohydramnios is associated with poor perinatal outcome. Apgar score < 7 at 1 min (20% Vs 9%), still births (4% Vs 0.5%) and neonatal ICU admission (9.5% Vs 23%) with statistically significant difference ($p<0.05$). The results are favoured by Chauhan et al [5], Chate et al [4]. Apgar score < 7 at 5 min (6% Vs 3.5%) is not statistically significant difference with $p=0.316$.

The limitations of study include: tertiary care hospital based figures are not strictly representative of the whole population, specified inclusion and exclusion criteria, limited surveillance methods. Scalp blood sampling and acoustic stimulation and amnioinfusion would have altered the outcome.

Conclusion

Oligohydramnios is associated with increased chances of nonreassuring fetal heart rate and nonreactive CTG, abnormal doppler parameters, caesarean delivery, NICU admission, low apgar at 1min, still birth whereas it is not associated with increased instrumental deliveries. Thus, it is associated with adverse perinatal outcomes, more chances of caesarean deliveries.

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