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A Study On Oligohydramnios and Its Perinatal Outcome

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ABSTRACT

Background : Oligohydramnios is one of the major causes of perinatal morbidity and mortality. The sonographic diagnosis of oligohydramnios is usually based on an AFI≤5 cm or on a single deepest pocket of amniotic fluid≤2 cm.Our study was aimed to study the perinatal outcome in oligohydramnios. Aim and objective were to study maternal outcome in the form of mode of delivery, and to assess neonatal complications in terms of APGAR score at birth, NICU admission rates, meconium stained liquor in oligohydramnios.

Methods: This prospective study was done among 90 patients with gestational age from 28 - 42wks with Oligohydramnios AFI<5cms with intact membranes were analysed for perinatal outcomes admitted at department of obstetrics and Gynaecology in maharajah's institute of medical sciences, vizianagaram during June 2022 to January 2024.

Results: Mean maternal age is 26.1 years. Incidence of oligohydramnios was more in primipara (61.1%) in our study. Most AFI was in the range of 4-5 cm in 53.3%.Operative delivery (63%)is more common with most common cause is fetal distress(23.3%).Most of them have clear liquor(60%) and mostly delivered at early term (43.3%).Most of them are born with birth weight of 2.5k kg to 2.9 kg (38.8%) and with APGAR >7 (83%) in most cases. Most common cause of NICU admission is meconium aspiration syndrome (8.88%).

Conclusion: AFI is an important and convenient screening test for prediction of perinatal outcome. In presence of oligohydramnios, the risk of fetal distress, operative delivery, low Apgar score, low birth weight, perinatal morbidity and mortality are more. Hence early detection of oligohydramnios, associated antenatal risk factors and timely management can improve the maternal and fetal outcome.

Key Words: *oligohydramnios, Caesarean section, Meconium stained amniotic fluid, APGAR Score, NICU admission.*

INTRODUCTION:-

Oligohydramnios is the commonest amniotic fluid disorder, characterized by reduced amniotic fluid or amniotic fluid volume that is less than expected for gestational age[1].The amniotic fluid (AF) is a part of the baby's life support system. Amniotic fluid is produced soon after the amniotic sac is formed at about 12 days after conception. It is first made up of effusion that is provided by the mother's circulation and then around the 20th weeks fetal urine becomes the primary substance [2].

It provides nutrients and in the development of lungs and gastrointestinal tract and also has bacteriostatic properties[3]. Amniotic volume levels peaks to 800-1000ml at 28-32 weeks then slowly decreases and plateaus near term with further reduction to only 400 ml at 42 weeks[4].The composition of the amniotic fluid up to this period is identical to that of fetal plasma as there is free diffusion of the fluid to and from the fetus. The fetal skin then begins to keratinize, the process being completed by 25 weeks. Thereafter, the two major source of amniotic fluid are fetal urine and lung secretions. Removal of fluid depends largely on fetal swallowing and intramembranous transport via the skin, placenta and cord surfaces. Oligohydramnios is associated with increased risk of adverse perinatal outcome which include:

Abortion, Meconium aspiration syndrome , Fetal pulmonary hypoplasia ,Fetal deformity,Cord compression ,Perinatal mortality.

If the measurement of AF is low it is called oligohydramnios. If the measurement of AF is high it is called polyhydramnios [5].The sonographic diagnosis of oligohydramnios is usually based on an AFI≤5 cm (or) on a single deepest pocket of amniotic fluid≤2 cm. In settings where ultrasound use is widespread, rates of oligohydramnios have been reported between 0.5 to 8% among pregnant women[6].

Oligohydramnios complicates 4.4% of all pregnancies at term. The incidence of oligohydramnios is less than 1% in preterm pregnancies[7].

Diagnosis of oligohydramnios during the second trimester is more likely to be associated with fetal or maternal anomalies[8].Normally during third trimester, around 3% to 8% of pregnant women are with low amniotic fluid at any point of pregnancy [9].

The incidence of maternal and foetal complications is increased in Oligohydramnios. It may be related to uteroplacental insufficiency, preeclampsia, asthma, diabetes, coronary failure, congenital defects, idiopathic limitation of foetal development, foetal hypoxia[10].

In chronic placental insufficiency, there is brain sparing effect and reshuffling of blood flow at cost of renal and hepatic supply. This leads to reduced fetal urine output leading to oligohydramnios. So, oligohydramnios is an indirect marker of placental insufficiency. Long standing effects of decrease amniotic fluid includes pulmonary hypoplasia, potter's syndrome, club foot, club hand and dislocation of hip. High incidence of maternal and perinatal morbidity and mortality are associated with oligohydramnios[11].

Perinatal outcome in the form of meconium staining, IUGR, cesarean section for abnormal FHR tracing, low Apgar score and neonatal intensive care unit admission have been associated with reduced amniotic fluid volume. It has been observed that antepartum or intra partum AFI≤5 cm is associated with a significant increase in lower segment caesarean section for fetal distress and low APGAR score at 5 minutes (APGAR score<5)[12].

AIMS AND OBJECTIVES:-

Aim is to demonstrate perinatal outcome in antenatal patients with oligohydramnios.

Objective is to study obstetric outcome in terms of mode of delivery, indication for operative interference and neonatal outcome in terms of birth weight,APGAR score,colour of liquor ,admission to NICU.

MATERIALS AND METHODS :-

This study was conducted on all singleton, non-anomalous, low risk pregnant women with AFI less than or equal to 5 with intact membranes and gestational age between 28-42 weeks at MIMS Hospital in the Department of Obstetrics and Gynaecology after taking informed consent.

1. Study design: prospective observational study
2. Study period: 18 months (JUNE 2022– JAN 2024)
3. Place of study: Maharajah's institute of medical sciences(MIMS),Nellimarla,Vizianagaram.
4. Total sample size :90

INCLUSION CRITERIA

1. Singleton pregnancy with gestational age 28-42 weeks.
2. Alive baby
3. With intact membranes.
4. AFI less than or equal to 5 measured by phelan's fourquadrant technique.

EXCLUSION CRITERIA

1. Patients not willing to give informed consent.
2. Women with premature rupture of membranes.
3. Multifetal gestation
4. Fetal malformations
5. Patients with major respiratory and cardiac diseases
6. Hypertensive disorders of pregnancy
7. Gestational diabetes mellitus

METHODOLOGY

1. The pregnant woman meeting the inclusion and exclusion criteria were enrolled in the study after obtaining informed consent

2. Data was collected using a proforma by convenient sampling method.
3. Detailed clinical history including obstetric, menstrual, past and personal history were taken and detailed examination was done. Basic routine blood investigations were done.
4. Liquor volume was estimated by ultrasonography by measuring the AFI by four quadrant technique of phelan or when the single deepest vertical pocket measures less than 2cms. Delivery was optimized depending on antepartum fetal surveillance.

All the information was entered in the proforma and analyzed and observations were made and accordingly discussion and recommendations were made

RESULTS:-

Table 1: Age distribution of patients.

Age(years)	Number of patients	Percentage
<20	5	5.5
20-25	58	64.4
26-30	21	23
>30	6	6.6

Out of 90 patients 5 (5.5%)patients are 20 years.58 (64.4%) patients between 20-25 years.
21 (23%)arebetween 26 -30 years. 6 (6.6%)patients are greater than 30 years.

Table 2 : Gravidity distribution

Gravida	Number of patients	Percentage
PRIMI	55	61.1
2	16	17.7
3	13	14.4
>3	6	6.6

Out of 90 patients most of the patients 55 (61.1%)are primi .Para 2 in 16(17.7%) patients.
Para 3 in 13patients 14.4 % and more than 3 in 6 patients (6.6 %).

Table 3: Gestational age distribution

Gestational Age	Number	Percentage
Very Preterm(28-31+6)	1	1.11
Moderate preterm(32-33+6)	2	2.22
Late preterm(34-36+6)	15	16.6
Early term(37-38+6)	39	43.3
Full term(39-40+6)	33	36.6
Late term(41-41+6)	0	0

Out of 90 patients most common are early term 39(43.3%).One are very preterm (1.11%).Two (2.22%) are moderate preterm, 15 (16.6%) are late preterm.33(36.6%) are full term and none are late preterm.

Table 4: AFI categories

AFI	Number	Percentage
0	1	1.11
1.0-2	12	13.3
2.1-3	16	17.7
3.1-4	13	14.4
4.1-5	48	53.3

Out of 90 patients 48 patients have AFI in the range of 4-5 .One(1.11%) had zero AFI .Twelve (13.3%) had in range of 1-2cm .Sixteen (17.7 %) had in the range of 2.1 to 3 cm.Thirteen (14.4%) had in the range of 3.1 -4 cm.

Table 5 : Mode of delivery

Mode of delivery		Number	Percentage
Spontaneous labour	Normal Vaginal	8	8.8
	Emergency LSCS	7	7.7
	Forceps delivery	1	1.11
Induced labour	Normal Vaginal	22	24.4
	Emergency LSCS	29	32.2
	Forceps delivery	2	2.22
Elective LSCS		21	23.3

Out of 90 patients 16 had spontaneous onset in which 8 (8.8%) were normal vaginal delivery, emergency LSCS in 7 (7.7%)cases and forceps delivery in 1(1.11%).In 53 labour was induced out of which 22 (24.4%) were delivered normal vaginal delivery ,29 (32.2%) emergency LSCS ,2 (2.22%) forcepdelivery.21(23.3%) patients had elective.

Table 6: Indication for LSCS

Indication for LSCS	Number	Percentage
Fetal distress	21	23.3
Non-progression of labour	07	7.77
CPD	03	3.33
Failed induction	7	7.77
IUGR with doppler changes	8	8.88
Previous LSCS	5	5.55
Meconium stained liquor	6	6.66

Out of 90 patients the most common indication for LSCS is fetal distress in 21(23.3%) patients.Non progression of labour and failed induction in 7(7.77%) cases each respectively.3(3.33%) cases had CPD. IUGR with doppler changes in 8(8.88%)cases.5(5.55%)cases had previous LSCS. Meconium stained liquor in 6 cases(6.66%).

Table 7:Nature of amniotic fluid

Amniotic fluid	Number	Percentage
Absent	1	1.11
Clear	54	60
MSL Grade 1	20	22.2
MSL Grade 2	10	11.1
MSL Grade 3	5	5.55

Out of 90 patients 54 had clear liquor .Absent liquor in one member(1.11%).20 (22.2%)had grade 1 MSL.10 (11.1%)had grade 2 MSL.5 (5.55%)had grade 3 MSL.

Table 8 : APGAR at 1 minute and 5 minutes

APGAR	Number	Percentage
0 – 4	1	1.11
5 – 7	14	15.5
>7	75	83.3

Out of 90 patients 75 (83.3%) APGAR > 7 .14 (15.5%) had APGAR between 5-7 and 1(1.11%) had between 0-4.

Table 9 : Indication for NICU admission

Indication	Number	Percentage
Birth Asphyxia	3	3.33
IUGR	3	3.33
Meconium aspiration syndrome	8	8.88
Perinatal depression	4	4.44
Prematurity	2	2.22
TTNB	5	5.55
Total	25	27.7

Out of 90 neonates most common cause of NICU admission is meconium aspiration syndrome in 8 (8.88%).Birth asphyxia in 3(3.33%).IUGR in 3 (3.33%) neonates. Perinatal depression in 4 (4.44%).Prematurity in 2(2.22%).Transient tachypnoea of new born in 5(5.55%) neonates.

Table 10 : Fetal weight distribution

Fetal weight	Number	Percentage
1000 – 1499 Gms	1	1.11
1500 – 1999 Gms	9	10
2000 – 2499 Gms	26	28.8
2500 – 2999 Gms	35	38.8
3000 – 3500 Gms	19	21.1

Out of 90 patients 35 (38.8%) are between 2.5 kg to 2.9 kg .One (1.11%) is between 1kg to 1.4 kg. 9 (10 %) are between 1.5 kg to 1.9 kg.26 (28.8%) are between 2.0 to 2.4 kg.19 (21.1%) are between 3.0 kg to 3.5 kg.

DISCUSSION:-

Amniotic fluid is important marker for fetal wellbeing. Oligohydramnios is associated with many maternal and fetal factors, like PIH, IUGR, maternal systemic disease, fetal anomalies, and unexplained. In our study, amniotic Fluid volume was assessed by ultrasonography using amniotic fluid index.

Majority of study participants were in age group between 20-25 years a with mean mean maternal age 26.1 years which is comparable to study done by Kaur T et al in which it was 25.8 years [13]and Ahmar R et al which is 26.1 years [14].

In present study maximum number of patients were primigravida (61.1%). This is similar to study done by Jeyamani B et al [15]in which 60 % were primigravida and in Sreelakshmi U et al in which primigravida were 73 %[16] .

In present study maximum number of patients were early term which is 43.3%. This is similar to study done by Chauhan R et al [17],Cheruku Amani et al [18] and Panda s et al [19].

In present study maximum number of patients have AFI with in range of 4.1 to 5 cms is **53.3**% . This is similar to study done by Chaudhari KR et al which is 34.6%[20] and by Ghosh R et al which is 22% [21].

Chate P et al[22] found that, the caesarean section was performed in 64 % of pregnancies and in Bastakoti R et al [23]62 % of patients had LSCS. These are comparable to our study in which 63 % of patients had undergone caesarean section.

In the present study, 63% of women underwent caesarean delivery. Emergency LSCS for fetal distress was done for 23.3%. This is similar to study by Patil SV et al [24] and Vidyasagara M et al [25] in which most common cause of Emergency LSCS is fetal distress i.e 36 % and 35.5% respectively.

In present study maximum number of patients have clear liquor 60 %.This is similar to study done by Sunita Ghike et al[26] which is clear liquor 45.95% and Roshini S et al [27] in which clear liquor is 52.5 %.

In study Tripti Markam et al [28] and Hazha Azad Ibrahim et al [29] the maximum had APGAR >7 in 62 % and 75.3 % respectively which is similar to present study which is 83%.

The most common indication for NICU admission is meconium aspiration syndrome in this study which is 8.8 % which is similar to Biradar KD et al [30] and Uniyal P et al [31] which is 6 % and 11 % respectively.

Most of fetus are born with a birth weight of 2.5 kg to 3.0 kg which is similar to study done by Thorat SN et al [32]and Sharmila Raviet al [33]which have birth weight between 2.5 kg to 3.0 kg.

CONCLUSION:-

Amniotic fluid volume is a predictor to identify pregnancies at risk of poor perinatal outcomes and its decrease is associated with increased risk of perinatal morbidity and mortality .In this study amniotic fluid index of ≤5cm was commonly associated with increased caesarean section rates.

Due to high perinatal morbidity and mortality, the incidence of LSCS increases. However, vaginal delivery has similar outcome, but strict vigilance in labour is mandatory. The presence of any other risk factor with oligohydramnios increases the chances of caesarean delivery.

In the presence of low AFI, the incidence of MSL, abnormal FHR, low apgar, rate of LSCS, low birthweight, NICU admissions and perinatal mortality are high.

The study recommends that AFI surveillance needs to be an integral part of any antenatal foetal surveillance. So timely intervention by an obstetrician will be of help in improving the perinatal outcome.

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