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RESEARCH ARTICLE

A STUDY ON MATERNAL AND FETAL OUTCOME IN OLIGOHYDRAMNIOS

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Abstract

Background: Amniotic fluid provides a protected milieu for growing fetus, cushioning the fetus against mechanical and biological injury. It also supplies nutrients and facilitates growth and movement.Oligohydramnios is defined as Amniotic fluid index (AFI) less than 5 cm, or deep vertical pocket < 2[1]. It occurs in 1–5% pregnancies at term, with the incidence increasing in postdate pregnancies to 11%.[2]

Maternal conditions associated with decreased AFV (amniotic fluid volume)include post-dated pregnancy, preterm premature rupture of membranes (PPROM), hypertension, autoimmune disorders and maternal medication like prostaglandin synthetase inhibitors.

Fetal factors: Which influence AFV are essentially related to fetal growth (intrauterine growth restriction) and fetal anomalies, particularly of the renal tract. The most commonly associated renal anomalies with oligohydramnios include bilateral renal agenesis, multicystic dysplastic kidneys, bladder outlet obstruction and infantile polycystic kidney disease.The aim of this study is to evaluate the etiological risk factors of oligohydramnios and to know the clinical significance and mode of delivery and maternal and perinatal outcome.

Methods: This was a retrospective study conducted on 100 cases in Basaveshwar Medical and Teaching Hospital attached to MahadevappaRampure Medical college, Kalaburagi from 1-8-2023 to 1-6-2024.All cases coming to Basaveshwar medical and teaching hospital with oligohydramnios were included in the study after fulfilling inclusion and exclusion criteria

Results: Of the 100 cases in the present study,40 cases were in 25-30 years accounting for 40% of cases with maximum number of cases in this age group.56 cases were primigravida accounting for 56% of cases with majority of cases being primigravida and 44 cases were multigravida accounting for 44% of cases.The number of cases with preterm rupture of membranes were 21 (21%), cases with Intra uterine growth restriction were 15 (15%). 6 cases (6%) had congenital anamolies. The number of cases withpost dated pregnancy were 22 (22%), Pregnancy induced hypertension cases were 28 (28%). Cases with autoimmune diseases were 1 (1%) and 7 cases (7%) were

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idiopathic.The most important cause for oligohydramnios was pregnancy induced hypertension and post-dated pregnancy. 13 of the cases had spontaneous onset of labouri.e 13% cases, 28 cases (28%) were induced and 59 cases underwent cesarean section accounting for 59% of all cases.In the present study, total of 19 cases underwent cesarean section because of fetal distress accounting for 19% of cases with the most common indication for cesarean section.11 cases (11%) underwent LSCS due to IUGR, ,4 cases (4%) underwent cesarean section because of non-progression of labour, 2 cases(2%) underwent LSCS because of malpresentation/malposition, 9 cases (9%) had cephalopelvic disproportion, 2 cases (2%) refused for induction of labour and 12 cases (12%) were previous LSCS.Among the 100 cases studied ,there were 8 cases (8%) with meconium aspiration syndrome, 5 cases (5%) had respiratory distress, 6 cases (6%) had low birth weight, 6 cases (6%) with congenital anomalies, 21 cases (21%)had NICU admissions, 4 cases (4%) were still born and 2 cases(2%) had intrauterine fetal death

Conclusion: Oligohydramnios is associated with fetal distress, meconium aspiration syndrome ,respiratory distress syndrome ,increased NICU admissions, low birth weight, perinatal mortality, morbidity and increased maternal morbidity due to increased cesarean section rates.Oligohydramnios requires intense fetal monitoring with proper antenatal and intrapartum care.Hence, AFI can be used as a primary tool in fetal surveillance in antenatal and intrapartum period and can help in categorization of fetus into high risk and low risk .One can have favourable outcome with good antenatal and intrapartum care

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Introduction:-

Amniotic fluid creates a protective environment for the developing fetus, cushioning it from mechanical and biological injuries, providing nutrients, and supporting growth and movement.

Initially, the fluid's composition is the same as that of fetal plasma due to free diffusion.

By 25 weeks, fetal skin begins to keratinize, marking a shift in the primary sources of amniotic fluid to fetal urine and lung secretions. The removal of this fluid relies primarily on fetal swallowing and transport through the skin, placenta, and umbilical cord. Near term, a fetus produces between 500 and 1200 ml of urine and swallows approximately 210 to 760 ml of amniotic fluid each day[1].

Even minor disturbances in these processes can disrupt the balance, leading to significant changes in amniotic fluid volume

The amount of amniotic fluid increases from 25 ml at 10 weeks to approximately 400 ml by 20 weeks. By 28 weeks, the volume increases to around 800–1000 ml, levels off near term, and then decreases to about 400 ml by 42 weeks[2].

Oligohydramnios is defined as Amniotic fluid index (AFI) less than 5 cm, or deep vertical pocket < 2[3]

It occurs in 1–5% pregnancies at term, with the incidence increasing in postdate pregnancies to 11%.[4]

Maternal conditions
Linked to decreased amniotic fluid volume (AFV) include postdated pregnancy, preterm premature rupture of membranes (PPROM), hypertension, autoimmune disorders, and the use of certain medications, such as prostaglandin synthetase inhibitors.

Fetal factors
That impact AFV are primarily related to growth, such as intrauterine growth restriction, and fetal anomalies, particularly those affecting the renal system.

Common renal anomalies associated with oligohydramnios include bilateral renal agenesis, multicystic dysplastic kidneys, bladder outlet obstruction, and infantile polycystic kidney disease. There is also a reported increase in musculoskeletal, digestive, and cardiac anomalies[5].

The incidence of structural malformations and aneuploidy in cases of oligohydramnios ranges from 7% to 37% and 4.4% to 30.7%, respectively[6]

Clinically the uterus appears small for dates when there is moderate to severe oligohydramnios, more so if associated with a growth-restricted fetus. The fetal parts are palpated easily and the uterus feels as if it is clamped over the fetal parts, with little ballottement. The diagnosis is confirmed by ultrasonography.

Reduced amniotic fluid, particularly in the third trimester, has been associated with multiple fetal risks, such as cord compression, musculoskeletal abnormalities like facial distortion and clubfoot, intrauterine growth restriction, low birth weight, fetal distress in labor, meconium aspiration syndrome, severe birth asphyxia, low APGAR scores, NICU admission, congenital abnormalities, and stillbirths.[7]

Long standingoligohydramnios can cause positional deformity from persistent compression by uterine wall like CTEV(congenital talipesequinovarus),contractures of limbs, wry neck, ankylosis of joints, hip dislocation and Potter's syndrome.

The aim of this study is to evaluate the etiological risk factors of oligohydramnios and to know the clinical significance and mode of delivery and maternal and perinatal outcome.

Methods:-

This was a retrospective study conducted in Basaveshwar Medical and Teaching Hospital attached to Mahadevappa Rampure Medical college, Kalaburagi from 1-8-2023 to 1-6-2024

All cases coming to Basaveshwar medical and teaching hospital with oligohydramnios were included in the study after fulfilling inclusion and exclusion criteria

Inclusion criteria
In this study all the patients with
1. Singleton pregnancy
2. Gestational age of more than 30 weeks
3. AFI <5cms were included

Exclusion criteria
Women with
1.Multiple gestation
2. With wrong or mistaken dates
3. Gestational age of 30 weeks or less were excluded.

General and systemic examination was performed, followed by Obstetric examination, which included grips, symphysio-fundal height, lie,presentation, estimated fetal weight and fetal heart sounds.

Per abdomen and per vaginal examination were done. Baseline investigations were done.
Ultrasonography was done to determine gestation age, presentation, placental grading and localization, fetal weight, amniotic fluid index and to detect any major congenital anomalies.

Mode of delivery, indication of caesarean section if performed, NICU admissions, perinatal morbidity and mortality, fetal and maternal outcome were recorded

Statistical analysis
The data collected was presented in tables in simple descriptive statistics in numbers and percentages. The analysed data was compared with different studies and discussed in discussion.

Results:-

Total number of cases in the present study were 100.

Table 1:- Distribution of cases based on age.

Sl No.	Age	Number of cases	Percentage
1.	**20-25 years**	31	31%
2.	**25-30 years**	40	40%
3.	**30-35 years**	23	23%
4.	**35-40 years**	6	6%

Of the 100 cases in the present study ,there were 31 cases in age group of 20-25 years accounting for 31% of cases, 40 cases in 25-30 years accounting for 40% of cases with maximum number of cases in this age group . 23 cases (23%) in age group of 30-35 years, 6 cases (6%) in between 35-40 years.

Table 2:- Distribution of cases based on parity.

Parity	Number of cases	Percentage
Primigravida	56	56%
Multigravida	44	44%

56 cases were primigravida accounting for 56% of cases with majority of cases being primigravida and 44 cases were multigravida accounting for 44% of cases

Table 3:- Distribution of cases based on cause of Oligohydramnios.

Sl No.	Causes	Number of cases	Percentage
1.	**Preterm rupture of membranes**	21	21%
2.	**Intra uterine growth restriction**	15	15%
3.	**Congenital anamolies**	6	6%
4.	**Post-dated pregnancy**	22	22%
5.	**Pregnancy induced hypertension**	28	28%
6.	**Maternal autoimmune diseases**	1	1%
7.	**Idiopathic**	7	7%

The above table depicts causes of oligohydramnios in the present study.

The number of cases with preterm rupture of membranes were 21 (21%), cases with Intra uterine growth restriction were 15 (15%). 6 cases (6%) had congenital anamolies. The number of cases with post dated pregnancy were 22 (22%), Pregnancy induced hypertension cases were 28 (28%). Cases with autoimmune diseases were 1 (1%) and 7 cases (7%) were idiopathic.

The most important cause for oligohydramnios was pregnancy induced hypertension and post-dated pregnancy.

Table 4:- Mode of delivery.

Mode of delivery	Number of cases	Percentage
Spontaneous onset of labour	13	13%
Induced labour	28	28%
Cesarean section	59	59%

13 of the cases had spontaneous onset of labouri.e 13% cases, 28 cases (28%) were induced and 59 cases underwent cesarean section accounting for 59% of all cases.

Table 5:- Indications of cesarean section.

Indications of cesarean section	Number of cases	Percentage
Fetal distress	19	19%
IUGR	11	11%
Non-progression of labour	4	4%
Malpresentation and malposition	2	2%
Cephalopelvic disproportion	9	9%
Refusal for induction of labour	2	2%
Previous LSCS	12	12%

In the present study, total of 19 cases underwent cesarean section because of fetal distress accounting for 19% of cases with the most common indication for cesarean section.

11 cases (11%) underwent LSCS due to IUGR, ,4 cases (4%) underwent cesarean section because of non-progression of labour, 2 case(2%) underwent LSCS because ofmalpresentation/malposition, 9 cases (9%) hadcephalopelvic disproportion, 2 cases (2%) refused for induction of labour and 12 cases (12%) were previous LSCS.

Table 6:- Fetal outcome.

FETAL OUTCOME	Number of cases	Percentage
Meconium aspiration syndrome	8	8%
Respiratory distress	5	5%
Low birth weight	6	6%
Congenital anamoly	6	6%
NICU admissions	21	21%
Still born	4	4%
Intra uterine fetal death	2	2%

The above table depicts the fetal outcome

Among the 100 cases studied ,there were 8 cases (8%) with meconium aspiration syndrome, 5 cases (5%) had respiratory distress, 6 cases (6%) had low birth weight, 6 cases (6%) with congenital anomalies, 21 cases (21%)had NICU admissions, 4 cases (4%) were still born and 2 cases(2%) had intrauterine fetal death

Discussion:-

In the present study,100 cases were studied with oligohydramnios with gestational age of > 30weeks for maternal, perinatal outcome, causes of oligohydramnios, and mode of delivery were analysed.

In the present study maximum number of cases were present in the age group of **25-30 years** , which was comparable with study done by Ahmar et al[8] in which mean maternal age was 26.1 years and another study done by Kaur T et al[9] in which the mean age group was 25.8 years.

In the present study, cases of oligohydramnios were more in **Primigravida** which was similar to study conducted by Bhat etal where 56% cases were primigravida.

In the presentstudy total of **28%** cases were **induced** , which was similar to study done by Casey B etal[10] where 32% of cases were induced with labour. Similarly, study conducted by Ahmar Ret al [8] 30% cases were induced with labour.

In the present study **fetal distress** was one of the main indication for emergency LSCS , which was similar to study conducted by Umber et al (32%) [11] , Jandial et al (42%)[12], Nazlima et al (58%)[13] and in Radhamani et al it was 31%[14]

NICU admissions were 21 cases out of 100, accounting for **21 %** which was similar to study conducted by Rizvi SM etal [15], Kansal R et al [16] and Hindhumatiet al[17]

Perinatal mortality was 6% which was similar to study conducted by Ahmad R et al 7.7%[8]

Conclusion:-

Oligohydramnios is associated with fetal distress, meconium aspiration syndrome ,respiratory distress syndrome ,increased NICU admissions, low birth weight, perinatal mortality, morbidity and increased maternal morbidity due to increased cesarean section rates.

Oligohydramnios requires intense fetal monitoring with proper antenatal and intrapartum care.

AFI is also a component of **biophysical profile** and helps in early detection of high risk fetuses.

Hence, AFI can be used as a primary tool in fetal surveillance in antenatal and intrapartum period and can help in categorization of fetus into high risk and low risk

One can have favourable outcome with good antenatal and intrapartum care

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