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A CLINICAL STUDY OF EFFECTS OF POLY AND OLIGOHYDRAMNIOS ON OBSTETRIC OUTCOME WITH A SPECIAL REFERENCE TO PERINATAL MORTALITY AND MORBIDITY

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ABSTRACT: OBJECTIVES: To study the obstetric outcome in pregnancies with oligohydramnios and polyhydramnios. To determine the perinatal outcome in pregnancies complicated with oligohydramnios and polyhydramnios. **METHODS:** This study is conducted on pregnant woman with abnormal liquor volume who attended the antenatal clinic at Institute of obstetrics and gynecology, Bowring and Lady curzon Hospital attached to BMCRI Bengaluru January 2013 to January 2014, 150 cases of oligohydramnios and 50 cases of polyhydramnios were selected for the study. A detailed history was taken. Detailed examination was done. Routine investigation was done. USG was done. Patient was followed up for timely and post-natal period. The values obtained so far was tabulated, analyzed, compared with other studies and concluded. **RESULTS:** Majority of the oligohydramnios cases were primigavida and polyhydramnios cases were multigravida. Mild polyhydramnios was the most common type. Isolated oligohydramnios (37.33%) was the most common cause followed by postdated pregnancy (28.67%) and third being the hypertensive diseases of pregnancy (17.34%) in oligohydramnios group. Incidence of congenital anomalies was high in polyhydramnios (22%) than in oligohydramnios (4%). Induction of labour was high in oligohydramnios group (65.33%) than in polyhydramnios (20%) group. 59.33% were underwent cesarean section in oligohydramnios group compared to 18% in polyhydramnios group. Fetal distress (76.4%) was the leading cause of cesarean in oligohydramnios, CPD (33.33%) was the common cause in polyhydramnios group. In oligohydramnios group, the alive babies' rate was 92.7% and perinatal death was 7.3%. In polyhydramnios group, the alive and perinatal death rate was 72%, and 28% respectively. In the oligohydramnios group, congenital anomaly was not the cause of any perinatal death but in polyhydramnios group majority of the death was due to lethal congenital anomalies. Birth weight <2.5kg were high in oligohydramnios group (54%). IUGR cases were common in oligohydramnios group. NICU admission was highest in oligohydramnios group (50.66%) than polyhydramnios (28%) group. **CONCLUSION:** Development of abnormal liquor volume during pregnancy signals danger to the foetus. It is associated with an increased incidence of caesarean section, labour complications and adverse perinatal outcome. Etiological factors are important in all cases of abnormal liquor volume, to get better foetal outcome as well as to avoid the maternal complications.

KEYWORDS: Oligohydromnios, polyhydromnios, perinatal mortality, perinatal morbidity.

INTRODUCTION: As our ancestors crawled out of the ocean to life on land, we too, float in the amniotic fluid until birth. The Amniotic fluid starts its origin from the maternal plasma by

ORIGINAL ARTICLE

transudation as early as from the seventh week of gestation. Its amount varies throughout the pregnancy. The Amniotic fluid performs several functions during the intrauterine life. It helps to shape the fetal skeleton normally by creating the physical space, promotes fetal lung maturation and protects the umbilical cord from the compression during labour. Too much or too little amount of amniotic fluid is the most common clinically detectable intrinsic abnormality¹ which was the basis of our study.

Before the era of the invent of ultrasound use in obstetrics, the amniotic fluid volume was assessed clinically by the bimanual palpation and symphysio-fundal height which was found to be unreliable subsequently. In 1950, Prof. Sir. Ian donald² was the first to demonstrate and document the application of ultrasound to medical diagnosis. In modern obstetrics, ultrasound is an integral part of the obstetrician's armamentarium- almost an extension of the examining finger, because of its noninvasive nature, accuracy and repeatability.

The Amniotic fluid volume assessment is an integral part of the antepartum fetal surveillance because of its abnormality is an indicator of poor perinatal outcome. Various ultrasound methods have been proposed for the detection of amniotic fluid, among which the amniotic fluid index (AFI) is the most widely used method. J.P. phelan³ and colleagues in 1987 proposed this method. According to him, the amniotic fluid volume was categorized as follows,

| | |
|-----------------|---------|
| Normal | 8-24 cm |
| Borderline | 5-8 cm |
| Oligohydramnios | <5 |
| Polyhydramnios | ≥25 |
| Table 1 | |

Oligohydramnios is recently defined as AFI below 5th percentile for the gestational age. Postdated pregnancy, uteroplacental insufficiency, congenital anomalies especially renal abnormalities, meconium passage, fetal heart rate abnormalities, low 5 minute APGAR and increased NICU admission are associated with Oligohydramnios.⁴ Other studies are also shown that it is associated with increased perinatal morbidity and mortality. Hence antepartum fetal surveillance is mandatory in pregnant women with Oligohydramnios. Hence Oligohydramnios in term is considered as an indication for termination of pregnancy.

Polyhydramnios is defined as AFI > 95th percentile for gestational age. More than fifty percent of women with polyhydramnios, the etiology were unknown. Congenital fetal anomalies accounts for 20%, among which anencephaly occurs in 50% of the cases. Gestational diabetes, congenital infections also leads to the development of polyhydramnios. An increased risk of congenital abnormalities and perinatal mortality are associated with increasing severity of polyhydramnios⁵. Severe polyhydramnios (AFI≥35cm) is commonly associated with major congenital anomaly in 31% of cases.

AIMS AND OBJECTIVES: To study the obstetric outcome in pregnancies with oligohydramnios and polyhydramnios. To determine the perinatal outcome in pregnancies complicated with oligohydramnios and polyhydramnios.

ORIGINAL ARTICLE

METHODS: This descriptive study was carried out in the Department of Obstetrics and Gynecology at Institute of B and L Curzon Hospital attached to BMCRI. To evaluate the fetomaternal outcome in pregnancies complicated with abnormal liquor volume. Pregnant women with abnormal liquor volume who attended the antenatal clinic regularly and those who were singleton pregnancy, ultrasound finding of $AFI \leq 5\text{cm}$, gestational age of 28-42 weeks, with intact membranes. For polyhydramnios, singleton pregnancy, ultrasound finding of $AFI \geq 25\text{cm}$, gestational age of 28-42 weeks.

150 cases of Oligohydramnios and 50 cases of Polyhydramnios were selected as a study population. The study population were subjected to a detailed history taking including age of the patient, parity, last menstrual period, previous menstrual history, obstetric history, past medical and surgical history, family history, personal history were taken. Followed by complete physical examination including general examination (Including Ht, Wt, BMI, BP recorded at each visit, presence of anemia and pedal edema), cardiovascular and respiratory systemic examination, obstetric examination were done.

DISCUSSION: 57.3% were in the age of 20-25 yrs in oligohydramnios group, 42% were in the age of 26-30 yrs in polyhydramnios group. This is comparable to Guin et al.⁴ study in 2011.

In our study, among the parity distribution, 66% of the cases in oligohydramnios group were primigravida, but there was no significant relation of age and parity with oligohydramnios according to the study done by Casey et al.⁵ Chauhan et al.^{6,7} Magann et al.⁸ In polyhydramnios group majority of the women were multigravida which is comparable to study by Guin et al.⁴

In Oligohydramnios: In our study, 28.67% were postdated pregnancy as compared to 10.7% in Guin et al.⁴ study.

In our study, 17.34% were hypertensive disease of pregnancy as compared to 38.46% in Chandra et al.⁹ study, 3.5% in Guin et al.⁴ study and 8% in Preshit et al.¹⁰ study.

In our study, anemia was present in 3.33% of cases. APLA were present in 1.33%.

In Polyhydramnios: In our study, GDM were present in 16% as compared to Guin et al.⁴ study where 20% cases were GDM and 5% cases were GDM in Vaid et al.¹¹ study.

In our study, 10% cases were hypertensive diseases as compared to 17.7% in Guin et al.⁴ study and 13% in Vaid et al.¹¹ study.

In our study, 2% cases were Rh negative pregnancy as compared to Guin et al.⁴ where Rh -ve pregnancy were 4.4%, 1% in Lyndon M Hill et al.¹² study.

In Oligohydramnios: In our study, total of 4% cases had congenital anomalies as compared to 12.9% in Guin et al study, 5.8% in Anil Shetty et al.¹³

In our study, infantile PCKD were 2% as compared to Guin et al.⁴ study where 7.5% were PCKD. In our study 0.67% were MCKD, single umbilical artery and microcephaly.

In Polyhydramnios: In our study, total of 22% had congenital anomalies which were comparable to Guin et al.⁴ study where 31.1% were associated with congenital anomalies.

ORIGINAL ARTICLE

In our study, anencephaly was the common anomaly that account for 8% as compared to 6% in Guin et al.⁴ study and 65.96% in Vaid et al.¹¹ study.

Spina bifida was present in 4% cases in our study as compared to 4% in Guin et al.⁴ study.

Hydrocephalus with meningocele was in 4% cases in our study as compared to Guin et al.⁴ study where 10% cases were hydrocephalus, 10.63% in Vaid et al study.

Diaphragmatic hernia were present in 2% in our study, Duodenal atresia were 2% in our study as compared 4% in Guin et al.⁴ study.

In our study, Non immune hydrops were present in 2% cases as compared to 7% in Nicole Damato et al.¹⁴ study.

In our study, 37.33% were isolated oligohydramnios with no identifiable cause as compared to 52% in Krishna jagatia et al.

In our study, 28.67% were postdated pregnancy as compared to 10.7% in Guin et al.⁴ study.

In our study, 17.34% were hypertensive disease of pregnancy as compared to 38.46% in Chandra et al.⁹ study, 3.5% in Guin et al⁴ study and 8%> in Preshit chate et al.¹⁰ study.

In our study, 12.66% cases were IUGR which was comparable with Guin et al.⁴ study of 14.2% and 25% in Anil Shetty et al.¹³ study.

In our study, 4% cases were congenital anomalies as compared to 12.9% in Guin et al.⁴ study, 5.8% in Anil Shetty et al.¹³ study.

In our study, exact cause of polyhydramnios was not detected in 58% which is comparable with Brady et al.¹⁵ study.

In our study, total of 22% had congenital anomalies which were comparable to Guin et al.⁴ study where 31.1% were associated with congenital anomalies.

16% had GDM in our study which was comparable to 20% in Guin et al.⁴ study.

In our study, 2% had Rh isoimmunisation as compared to 4.4% in Guin et al.⁴ study, 1% in Lyndom M Hill et al.

In our study, 76%, 18%, 6% patients were mild, moderate and severe polyhydramnios respectively, which was comparable to Lyndon M. Hill et al.¹² where 77.4%, 18.6%, 4% were mild, moderate and severe polyhydramnios respectively. Majority of mild polyhydramnios were detected at term in our study.

In our study, induction rate was higher in oligohydramnios group of about 65.33% as compared to Guin et al.⁴ where 56.5% cases were induced.

In polyhydramnios group only 20% cases were induced as compared to 13.6% in Guin et al⁴ study.

The rate of cesarean section was 59.33% in oligohydramnios group which is comparable to 42.8% in Guin et al.⁴ study, 64% in Preshit chate et al.¹⁰ and 76.92% in Chandra P et al.⁹ study. This increased rate of cesarean was due to fetal distress. In our study 76.4% cases had fetal distress which in turn due to increased meconium stained liquor (57.33%) and IUGR. (18.66%) in our study.

In our study, 38.66% of babies had low 5minute APGAR score in oligohydramnios group as compared to 23.7% in Chandra et al⁹, 16% in Preshit chate et al.¹⁰

ORIGINAL ARTICLE

In polyhydramnios group only 18% underwent cesarean section as compared to 22.2% in Guin et al.⁴. Instrumental delivery rate was not significant in both oligo and polyhydramnios group in our study.

In our study, with polyhydramnios group, 20% cases were PROM as compared to 44.5% in Guin et al.⁴ 14% were preterm labour which was comparable to 40% in Guin et al.⁴ 6% had cord prolapse as compared to 4.4% in Guin et al.⁴ study.

In our study, atonic PPH were occurred in 4% of cases as compared to 4.4% in Guin et al.⁴ study. Retained placenta was seen in 2% cases in our study.

In our study, polyhydramnios group had high perinatal mortality rate of 28% as compared to oligohydramnios group which is 7.3%. This was comparable with Guin et al.⁴ study where perinatal mortality were 42.25% in polyhydramnios and 12.9% in oligohydramnios group. This high perinatal mortality in polyhydramnios group was due to increased fatal congenital anomalies.

In our study, with oligohydramnios group, 54% were ≤ 2.5 kg as compared to Chandra et al.⁹ and Preshit Chate et al.¹⁰ 45.99% were between 2.6-4kg, No babies were born above 4kg.

In contrast polyhydramnios group delivered 76.92% babies with birth weight between 2.6-4kg, 7.69% with >4 kg and 15.38% with ≤ 2.5 kg in our study.

In our study, 50.66% babies were admitted in NICU in oligohydramnios group which is comparable to 46.15% in Chandra et al.⁹ and 42% in Preshit Chate et al.¹¹ study. In polyhydramnios group 28% of babies were admitted in NICU.

RESULTS: The age distribution in the study population. Among the 150 oligohydramnios group, 57.3% were in the age of 20-25yrs. Among the 50 polyhydramnios group, 42% were in the age of 26-30yrs.

In oligohydramnios group, 62.66% were in the gestation age of >37 weeks, 29.33% between 33-37weeks and 8% between 28-32weeks. In the polyhydramnios group also, 64% were in >37 weeks, 22% between 33-37 weeks, 14% between 28-32 weeks.

Maternal conditions associated with oligohydramnios in which 28.67% were postdated pregnancy, 17.34% hypertensive disease (Among which 15.38% were gestational hypertension, 84.61% were preeclampsia), 3.33% of anemia and 1.33% of APLA syndrome were present.

In polyhydramnios associated maternal conditions. Among the 50 cases, GDM were present in 16% (Out of which 62.5%) were controlled GDM, 37.5% were uncontrolled), Preeclampsia in 6%, gestational hypertension in 4%, Rh negative pregnancy in 2% and chorioangioma of the placenta in 2%.

In 50 oligohydramnios patients, only 4% had congenital anomalies. Among which infantile polycystic kidney disease 2%, MCKD 0.67%, single umbilical artery 0.67%, microcephaly 0.67%.

In 50 polyhydramnios cases, Total of 22% had congenital anomalies. Among which anencephaly was the common anomaly accounts 8%, spina bifida 4%, hydrocephalus with meningomyelocele 4%, Diaphragmatic hernia 2%, Duodenal atresia 2% and Non immune hydrops in 2%.

ORIGINAL ARTICLE

| ETIOLOGY | AFI_{≤5} NO OF CASES N-150 | % |
|---|---|----------|
| Postdated Pregnancy | 43 | 28.67 |
| IUGR | 19 | 12.66 |
| Hypertensive Diseases | 26 | 17.34 |
| Congenital Anomalies | 6 | 4.00 |
| Idiopathic | 56 | 37.33 |
| Etiological factors in oligohydramnios | | |

This table shows the etiological factors in oligohydramnios group. According to this table 37.33% were isolated oligohydramnios with no identifiable cause, 28.67% were postdated pregnancy, 12.66% were IUGR, 17.34% were hypertensive diseases, 4% were congenital anomalies.

| ETIOLOGY | AFI _{≥ 25} NO OF CASES N-50 | % |
|--|---|----------|
| Idiopathic | 29 | 58 |
| Congenital Anomalies | 11 | 22 |
| GDM | 8 | 16 |
| Rh- Isoimmunisation | 1 | 2 |
| Chorioangioma of the placenta | 1 | 2 |
| Etiological factors in polyhydramnios | | |

This table shows the various etiological factors causing polyhydramnios in the study population. Exact cause of polyhydramnios were not detected in 58% of the cases. 22% had congenital anomalies, 16% had GDM, 2% had Rh isoimmunisation and 2% chorioangioma of the placenta.

76% were in mild polyhydramnios, 18% were moderate and 6% were in severe polyhydramnios group.

Among the oligohydramnios group, 65.33% were induced compared to 20% in polyhydramnios group. In oligohydramnios group 59.33% were underwent cesarean section compared 18% in polyhydramnios group. In polyhydramnios group 82% delivered vaginally compared to 40.66% in oligohydramnios group which is also statistically significant.

Among the indications for cesarean section in abnormal liquor volume, 76.40% were due to fetal distress, 11.23% due to CPD, 8.98% due to failed induction, 3.37% due to malpresentation in oligohydramnios group. In polyhydramnios group, 33.33% were due to CPD, 22.22% were due to malpresentation and fetal distress, 11.11% were due to cord prolapsed and failed induction.

57.33% had meconium stained liquor in oligohydramnios group compared to 12% in polyhydramnios group.

ORIGINAL ARTICLE

Among which 20% were PROM, 14% Preterm labour, 6% Cord Prolapse, 4% Atonic PPH, 2% Retained Placenta.

In Oligohydramnios group 92.70% were alive compared to 72% in polyhydramnios group. Perinatal death was 28% in polyhydramnios group compared to 7.3% in oligohydramnios group. 5 minutes APGAR score in oligohydramnios group was <7 in 38.66% compared to 28.20% in polyhydramnios group.

In oligohydramnios group, 54% were ≤ 2.5 kg, 45.99% were between 2.6-4kg, no babies were born above 4kg. In contrast polyhydramnios group delivered 76.92% babies with birth weight between 2.6-4kg, 7.69% with >4kg and 15.38% with ≤ 2.5 kg.

18.66% of babies were IUGR in oligohydramnios group. No cases of IUGR were present in polyhydramnios group.

| | Group | | | |
|--|-------|-------|------|----|
| | N-150 | % | N-39 | % |
| NICU Admission | 76 | 50.66 | 14 | 28 |
| NICU admission in abnormal volume | | | | |

This table shows the Number of NICU admission in abnormal liquor volume. Compared to polyhydramnios group, 50.66% of babies were admitted in NICU in oligohydramnios group.

SUMMARY AND CONCLUSION: Majority of the oligohydramnios cases were primigavida and polyhydramnios cases were multigravida. Idiopathic polyhydramnios (58%) were the first common cause of polyhydramnios, the second were congenital anomalies (22%) and the GDM (16%) was the third one. Most common congenital anomaly in oligohydramnios group were infantile polycystic kidney disease. In polyhydramnios group, anencephaly was the most common anomaly followed by spina bifida, hydrocephalus with meningomyelocele. Fetal distress (76.4%) was the leading cause of cesarean in oligohydramnios, CPD (33.33%) was the common cause in polyhydramnios group. In oligohydramnios group, the alive babies' rate was 92.7% and perinatal death was 7.3%. In polyhydramnios group, the alive and perinatal death rate was 72%, and 28% respectively. Birth weight <2.5kg were high in oligohydramnios group (54%). IUGR cases were common in oligohydramnios group. NICU admission was highest in oligohydramnios group (50.66%) than polyhydramnios (28%) group.

CONCLUSION: Abnormal liquor volume during pregnancy signals danger to the foetus. It is associated with an increased incidence of caesarean section, labour complications and adverse perinatal outcome. But isolated oligo and polyhydramnios in term gestation has better perinatal outcome compared to early onset and with associated conditions like hypertensive diseases of pregnancy, GDM, IUGR. Ultrasound is the ideal method to detect any abnormality in liquor volume. Etiological factors are important in all cases of abnormal liquor volume, to get better foetal outcome as well as to avoid the maternal complications.

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ORIGINAL ARTICLE

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