

# Audit of Perinatal Mortality and Congenital Anomalies in Oligohydramnios

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## Abstract

**Objective:** To assess the impact of oligohydramnios on perinatal outcomes, focusing on mortality rates, congenital anomalies, and associated complications in affected pregnancies.

**Methodology:** From January 2020 to December 2021, a descriptive cross-sectional study was carried out in the gynecology department of the Khyber Teaching Hospital in Peshawar. The method of consecutive non-probability sampling was applied. The study included all women, regardless of age or parity, who came to the outpatient department in their third trimester and had an amniotic fluid index of less than five on ultrasonography. Outcome was observed in the form of effects on fetus like prevalence of different congenital anomalies, admission in neonatal intensive care unit, stillbirths, baby with apgar score of less than 7, and growth restriction.

**Results:** The total number of oligohydramnios cases in the study period was 208, making the incidence of oligohydramnios 4%. Taking into account the gestational age at which they presented, 24% were in 33-37 weeks gestational age group, and 69% were 38 weeks and beyond. 44% were 2.1-2.5 kg and 29% were more than 2.5 kg. 22% of patients were admitted in NICU, 12% babies were growth restricted, 30% had meconium aspiration, and 6% were stillborns. The prevalence of congenital anomalies was 10%. Renal anomalies were seen in 6% of patients, pulmonary hypoplasia was observed in 3%, amniotic bands were seen in 2%, gastrointestinal system anomalies like gastroschisis seen in 1%, and musculoskeletal system anomalies in 1% cases.

**Conclusion:** Neonatal mortality and morbidity rates are increased if fetus is exposed to oligohydramnios in intrauterine life. Different congenital anomalies are observed, in addition to increased rates of NICU admissions, meconium aspiration, growth restriction and neonatal mortality rates.

**Key words:** Oligohydramnios, Musculoskeletal, Gastroschisis, Neonatal Mortality, Pulmonary Hypoplasia, Meconium

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## Introduction

Amniotic fluid acts as a protective cushion for the fetus, it prevents the umbilical cord from being compressed and enhances development of fetal lungs.<sup>1</sup> Its volume is about 50 ml at 12 weeks, 400 ml at 20 weeks, 800 ml at 28 weeks and 1000 ml at 36-38 weeks, after that, the volume reduces to about 600-800ml.<sup>2</sup>

Oligohydramnios is a common complication of pregnancy, with an incidence of 1 to 5%.<sup>3</sup> It is defined as an obstetrical phenomena where there is reduced volume of amniotic fluid relative to gestational age.<sup>4</sup> From a sonographic point of view, it is defined as maximum vertical pool of amniotic fluid less than 2 cm or amniotic fluid index of less than 5 cm.<sup>1</sup>

The intrusive dye dilution technique is considered the gold standard for measuring the volume of amniotic fluid. The single deepest pocket (SDP), two-diameter pocket, and four-quadrant amniotic fluid index (AFI) are examples of validated non-invasive techniques<sup>5,6</sup>. AFI < 5 cm, greatest deepest pocket < 2 cm, or amniotic fluid content < 5% for gestational age are the criteria for oligohydramnios. SDP is the most effective way to diagnose oligohydramnios; nevertheless, AFI is used in the majority of studies assessing unfavorable outcomes. Whichever approach was employed, the discovery of oligohydramnios is abnormal.<sup>7</sup>

Although it can happen at any point in the pregnancy, the last trimester is when it happens most frequently. The amount of amniotic fluid in a pregnant patient

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decreases by half after 42 weeks of gestation. In 12% of cases, oligohydramnios complicates pregnancies longer than 41 weeks.<sup>8</sup>

Oligohydramnios is associated with 37% of the cases of congenital anomalies in one study.<sup>9</sup> Regarding the maternal conditions that are frequently associated with oligohydramnios, uteroplacental insufficiency, hypertension, preeclampsia, diabetes, chronic hypoxia, rupture of amniotic membranes, dehydration, and post term gestation are most common.<sup>10</sup>

Pulmonary hypoplasia, meconium aspiration syndrome, cord compression, fetal compression, and chorioamnionitis if the membranes rupture for an extended length of time are among the fetal problems that can emerge from oligohydramnios.<sup>11</sup> Preterm delivery, low birth weight, fetal distress during labor, low apgar score, neonatal resuscitation, and NICU admission<sup>2</sup> are further unfavorable perinatal outcomes. Club foot, club hand, dislocation of the hip eight, pulmonary hypoplasia, and Potter's syndrome are among the consequences of prolonged oligohydramnios.<sup>12</sup>

The aim of this study was to find out significance of oligohydramnios in determining the perinatal outcome and the congenital anomalies in the babies who faced oligohydramnios in intrauterine life.

## Methodology

This descriptive cross-sectional study was conducted at the Gynaecology department of Khyber Teaching Hospital, Peshawar, from January 2020 to December 2021, utilizing consecutive non-probability sampling. The study enrolled women of any age or parity who visited the Outpatient department and exhibited an amniotic fluid index of less than 5 on ultrasonography during their third trimester. Exclusions comprised patients with a history of premature rupture of membranes, cardiac disease during antenatal care, multiple pregnancies, or normal/increased amniotic fluid levels.

Ethical approval was obtained from the hospital's committee, and written informed consent was acquired from participating patients after explaining the study's purpose. Patients were admitted via various departments—Outpatient, antenatal clinic, and labor room—undergoing comprehensive assessments, including detailed history, thorough general physical, abdominal, and vaginal examinations. Investigations

were sent to the hospital laboratory for analysis, followed by ultrasound confirmation of oligohydramnios, defined as an AFI of <5. Treatment encompassed advising left lateral positioning, rest, encouragement of oral fluids, intravenous hydration, and addressing underlying causes. The decision regarding delivery was made by the responsible consultant following the unit's protocol.

The study evaluated fetal outcomes, including the prevalence of different congenital anomalies, admission to neonatal intensive care units, occurrences of stillbirths, babies with an Apgar score of less than 7, and instances of growth restriction.

Data analysis was performed using SPSS 20.0, calculating mean and standard deviation for numerical variables and frequencies/percentages for categorical variables, and presented in tabular form.

## Results

The total number of oligohydramnios cases in the study period was 208, making the incidence of oligohydramnios 4%. Taking into account the gestational age at which they presented, 14 (7%) were in 28- 32 weeks gestational age group, 50(24%) were in 33- 37 weeks gestational age group, and 144(69%) were 38 weeks and beyond.

56(27%) patients were less than 2 kg, 92(44%) were 2.1- 2.5 kg, 60(29%) were more than 2.5kg. 46(22%) patients were admitted in NICU, 25(12%) babies were growth restricted, 52(30%) had meconium aspiration, and 12(6%) were stillborn. (Table I)

Outcome variable	N	%
Low Birth Weight	148	71%
NICU admission	46	22%
Preterm	64	31%
Meconium Aspiration	52	30%
APGAR <7	42	20%
IUGR	25	12%
Stillbirths	12	6%

The prevalence of congenital anomalies was 21(10%). Renal anomalies in the form of hydronephrosis/hydroureter, renal agenesis, polycystic kidney disease, posterior urethral valves were seen in 13(6%) patients; pulmonary hypoplasia was observed in 6(3%) cases; amniotic bands were seen in 4(2%) cases, gastrointestinal system anomalies like gastroschisis seen in 2(1%) cases, and musculoskeletal system anomalies in 2(1%) cases. (Table II)

**Table II: Congenital Anomalies. (n=208)**

Anomaly	N	%
Renal Anomalies	13	6%
Pulmonary Hypoplasia	6	3%
Amniotic Bands	4	2%
Cardiac	2	1%
Gastrointestinal	2	1%
Musculoskeletal	2	1%

## Discussion

Pregnancy complications such as oligohydramnios are prevalent and are estimated to affect 1 to 5% of all pregnancies. Ultrasonographic testing during pregnancy has made it feasible to accurately diagnose oligohydramnios.<sup>13</sup>

The overall prevalence of oligohydramnios in our study was 4%. This figure was lesser in the study done by KC S et al in 2019 where they observed the prevalence as 12%.<sup>14</sup> Whereas it was as high as 11.7% according to Bakhsh H et al.<sup>15</sup>

In our study, 69% of the women presented in 38 weeks or more gestational age group, whereas 24% were between 33-37 weeks' gestational age. In a research done at Nepal, 40% of the study population presented in 38 weeks or more gestational age whereas 18.33% were in 33-37 weeks, which is comparable to our study.<sup>16</sup>

According to our study, 44% babies weighed 2.1-2.5 kg and 29% were more than 2.5kg. The stillborn rate in our study was 6%, whereas it was 15.4% in a study done by Figueroa L et al in 2020.<sup>11</sup> In another study, 18% were 2.1-2.5kg and 65% were more than 2.5kg. 10.22% babies were admitted in NICU, this figure was seen as 18.3% in another study<sup>10</sup>, and 20% in a research done at King Abdul Aziz Hospital in Jeddah.<sup>17</sup> Same association was found in previous researches, which proved that less amniotic fluid volumes are certainly associated with low birth weights.<sup>18,19</sup>

The prevalence of congenital anomalies in our study was 10%. This prevalence was seen as 5.8% in another study, where the most common anomaly was hydronephrosis.<sup>20</sup>, just similar to our research. This prevalence was 14% in a prospective study done at India.<sup>21</sup> Pulmonary hypoplasia has association with oligohydramnios, the risk increases as the volume of amniotic fluid decreases.<sup>22</sup> According to Pariente G et al, 6% gastrointestinal morbidity cases in neonates were associated with oligohydramnios.<sup>23</sup>

Due to its frequent incidence, oligohydramnios requires appropriate antepartum and intrapartum treatment as

well as rigorous fetal surveillance. The evaluation of AFI in the early third trimester aids in the identification of women who require further antepartum surveillance so that appropriate care can be carried out to improve the mother and perinatal outcome. AFI is a significant component of biophysical profile grading.<sup>24</sup>

There were several limitations in our study. The severity of oligohydramnios was not considered, long term follow up of neonates was not done to detect any long term complications. Extension of the study to nearby hospitals could help in figuring out the magnitude of this complication in a larger locality.

## Conclusion

The prevalence of congenital anomalies is more in those neonates who were exposed to oligohydramnios in their intrauterine life. Although renal anomalies were more common, pulmonary, gastrointestinal, musculoskeletal anomalies and amniotic bands were also seen. NICU admissions, meconium aspiration, growth restriction and neonatal mortality was also observed.

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