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## RESEARCH ARTICLES

### CHARACTERISTICS OF PREGNANT WOMEN WITH OLIGOHYDRAMNIOS TREATED WITH AMNIOINFUSION AT DR. M. DJAMIL PADANG

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#### **Abstract**

**Introduction:** Oligohydramnios is a condition of reduced amniotic fluid. This is often detected accidentally during ultrasonography examination so that there is often a delay in diagnosis. Amnioinfusion is one of the therapies given to pregnant women with oligohydramnios

**Aim:** This study aims to determine the characteristics of pregnant women with oligohydramnios who are treated with amnioinfusion

**Method:** This was a descriptive study using medical record data of inpatients at the Fetomaternal Polyclinic, Dr. M. Djamil Hospital Padang from March 2022 to March 2023. The inclusion criteria were pregnant women diagnosed with oligohydramnios and the exclusion criteria were multiple pregnancies. Sampling was done by total sampling.

**Result:** There were 12 pregnant women who met the inclusion and exclusion criteria. Most of the subject aged 20-35 years (91.7%), high school graduates (58.3%), and multiparous (66.7%). There are as many as 50% of fetuses with congenital abnormalities. Most of the oligohydramnios were diagnosed in the third trimester (83.3%). Pregnant women with oligohydramnios have a relatively high proportion of preterm births (41.7%). Most of the subject still have good fetal outcome (alive) (66.7%).

**Conclusion:** Pregnant women with oligohydramnios had age, education and parity who were not at high risk but more often had fetuses with congenital abnormalities and premature births. Amnioinfusion reduces fetal mortality

**Keywords:** pregnancy, oligohydramnios, congenital abnormality, premature, amnioinfusion



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## INTRODUCTION

Oligohydramnios is the most common amniotic fluid disorder, characterized by reduced amniotic fluid or amniotic fluid volume that is less than expected for gestational age. Amniotic fluid volume is one of the most important components of a healthy pregnancy, because it serves as a protective cushion for the fetus, prevent compression of the umbilical cord, and promote fetal lung development. Although the mean volume of amniotic fluid varies with gestational age, abnormally low amniotic fluid volume has been associated with adverse pregnancy outcomes. Oligohydramnios, namely a very low volume of amniotic fluid (<500 ml) between the 32nd and 36th week of pregnancy, is a serious condition for the fetus and mother. Oligohydramnios can be diagnosed by ultrasonography performed during the late second or third trimester and determined by an Amniotic Fluid Index (AFI) below 5 cm or below the 5th percentile of amniotic fluid volume for gestational age. Oligohydramnios occurs in approximately 1-5% of term pregnancies worldwide; however, the prevalence increases to more than 12% in post-term pregnancies. The Indonesian Ministry of Health in 2016 reported that 8% of pregnant women had too few amniotic fluid. M. Djamil stated that 13.3% of pregnant women were diagnosed with oligohydramnios. Several maternal, placental, and fetal factors, such as premature rupture of membranes, fetal abnormalities, genetic factors, maternal disease, nutritional status, multiple pregnancies, use of nonsteroidal anti-inflammatory drugs (NSAIDs), and use of certain angiotensin converting enzyme inhibitors (ACEIs), have been found to be associated with oligohydramnios. Oligohydramnios is associated with poor maternal and fetal/neonatal outcomes, such as intrauterine fetal growth restriction, fetal distress, birth asphyxia, prolonged labor, and increased risk of caesarean section, often arising from cord compression, meconium aspiration, or uteroplacental insufficiency. In low- and middle-income countries, oligohydramnios accounts for about 6.5% of stillbirths. Amnioinfusion is an act of replacing amniotic fluid using normal saline or Ringer's lactate that is inserted into the uterine cavity. Artificially increased amniotic fluid volume can better protect the umbilical cord from compression. and thereby reduce the number and severity of variable decelerations. Dilution of thick meconium fluid also reduces the risk of meconium aspiration syndrome. Prophylactic amnioinfusion allows spontaneous vaginal delivery and avoids unnecessary operative intervention. As well as serving a therapeutic purpose, ultrasound-guided amnioinfusion can diagnose the presence of ruptured membranes by observing the leakage of blue fluid through the cervix. Identification and timely treatment have been associated with improved maternal and fetal/neonatal outcomes. However, the delay in diagnosis makes this management carried out too late, causing poor outcomes in pregnancy. So far, there is not enough data evaluating the administration of amnioinfusion in oligohydramnios patients in West Sumatra.

## METHOD

This research is a descriptive study to determine the characteristics of oligohydramnios patients treated with amnioinfusion at the Fetomaternal Polyclinic of RSUP Dr. M. Djamil, Padang from March 2022 to March 2023. The study population was all pregnant women who came to the Fetomaternal Polyclinic of RSUP Dr. M. Djamil, Padang. The inclusion criteria were pregnant women diagnosed with oligohydramnios. This study did not include women with multiple pregnancies. The data taken is secondary data derived from the medical records of RSUP Dr. M. Djamil, Padang. Sampling was carried out by total sampling where all samples that met the inclusion and exclusion criteria during the specified time period were taken as research participants.

## RESULTS AND DISCUSSION

In this study, it was found that 12 research subjects met the inclusion and exclusion criteria. Based on Table 1, it can be seen that there were no subjects under the age of 20, 11 subjects (91.7%) were aged 20-

35 years and only one (8.3%) was over 35 years. Most of the subjects had a senior high school education (7 people; 58.3%), 2 people (16.7%) had a bachelor's degree and no subjects had an elementary school education. A total of 8 subjects (66.7%) had a history of multiparous parity, 3 (25%) were primiparas and only 1 person (8.3%) was grand multipara. The number of pregnant women with oligohydramnios diagnosed in the second trimester is similar to the number in the third trimester. Five subjects (41.7%) gave birth at term gestation. As many as 6 subjects (50%) had fetuses with congenital abnormalities including multiple anomalies, kidney agenesis, gastroschisis, mermaid syndrome and hypothyroidism, 5 subjects (41.7%) experienced premature rupture of membranes, and 1 subject had no known cause of oligohydramnios. In this study, there were 8 live fetuses and 4 dead fetuses.

Table 1. Characteristics of pregnant women with oligohydramnios at RSUP Dr. M. Djamil, Padang

Characteristics	n	f(%)
<b>Mother's Age</b>		
<20	0	0
20-35	11	91,7
>35	1	8,3
<b>Education</b>		
SD	- 3	0
JUNIOR HIGH SCHOOL	7	25
SENIOR HIGH SCHOOL	2	58,3
S1		16,7
<b>Parity</b>		
Primipara	3	25
Multipara	8	66,7
Grande Multipara	1	8,3
<b>Reason</b>		
<b>Oligohydramnios</b>	1	8,3
Multiple Congenital Anomalies	2	16,7
Renal Agenesis	1	8,3
Gastroskizis	1	8,3
Mermaid Hypothyroid Syndrome	1	8,3
Premature rupture of membranes	5	41,7
Not known	1	8,3
<b>Diagnosis Time</b>		
Trimester 2	6	50
Trimester 3	6	50
<b>Termination Age</b>		
Preterm	5	41,7
term	7	58,3
<b>Fetal Outcomes</b>		
Life	8	66,7
Died	4	33,3 Total
		12 100

## DISCUSSION

The results of the study were derived from medical record data from patients at the Fetomaternal Polyclinic at RSUP Dr. M. Djamil, Padang from March 2022 to March 2023. In this study, most of the patients were aged 20-35 years. These results are similar to research by Baksh et al in 2021 where in this study 78% of subjects were under 35 years old. In that study, there was also no association



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between maternal age and the incidence of oligohydramnios. 7 Other similar results were also obtained by Ahmed et al in 2022 where the average age of pregnant women with oligohydramnios was  $26 \pm 0.35$  years, which was no different from the normal gestational age in the study, namely  $25 \pm 0.87$  years. 8 This shows, even though the age of 35 years has a high risk of pregnancy, the proportion of at-risk gestational age in this study was very small. Most of the subjects in this study had high school education which indicated that the educational status of the research sample was quite good. Twe et al in 2022 also found that 41.7% of pregnant women with oligohydramnios had a high school level of education. 1 Figueroa et al in 2020 also found that most of the study subjects with oligohydramnios had secondary education. 2 Although low educational status had an impact on mothers' knowledge about their pregnancy and subsequently had an indirect effect on poor pregnancy outcomes, 9 pregnant women with oligohydramnios in this study seems to still have a fairly good education. In this study, most research subjects had multipara parity. Research by Gandotra et al in 2020 found a higher proportion of oligohydramnios subjects with multiparas than primiparas and grande multiparas. 10 Ibrahim et al in 2019 also found that pregnant women with oligohydramnios had more multipara parity, but the proportion of primigravidas was much higher compared to this study. . Ibrahim et al also compared parity between oligohydramnios patients and controls and found that primigravida was more common in oligohydramnios patients. 11 Dai et al in 2022 stated that oligohydramnios was more common in multiparas in each age group of study subjects. This may be due to decreased placental function in multiparous women. 12 Different results were found by Luo et al in 2020 who got multipara parity more likely to experience polyhydramnios, while nullipara parities were more likely to experience premature rupture of membranes which is a risk factor for oligohydramnios. oligohydramnios with a clear cause such as a congenital abnormality of the fetus or premature rupture of membranes, parity does not really have an effect on oligohydramnios. Congenital abnormalities and premature rupture of membranes had almost the same proportion in this study which contributed to the cause of oligohydramnios in patients. Congenital abnormalities found in this study include renal agenesis, total malformation and mermaid syndrome. Subash et al in 2019 found congenital anomalies in 18.33% of pregnant women with oligohydramnios where renal malformations were the most common. The urine produced by the fetal kidneys is the main contributor to the volume of amniotic fluid in the second and third trimesters of pregnancy. Therefore, any structural or functional defect in the fetal urinary tract can result in a significant reduction in amniotic fluid volume leading to (oligohydramnios or anhydramnios). 15 Apart from renal agenesis, malformations of the gastrointestinal tract can also contribute to the occurrence of oligohydramnios. Research by Overcash et al in 2015 found that as many as 7% of patients with gastroschisis had oligohydramnios. 16 Ladella et al in 2021 found as many as 46 women who experienced premature rupture of membranes had a congenital fetal amnion index and if it occurred in the third trimester, the cause usually could not be explained. In oligohydramnios diagnosed in the second trimester, pulmonary hypoplasia is the main predictor of death with a mortality rate in the second trimester reaching 90%. The most severe hypoplasia occurs in oligohydramnios before or during 16-24 weeks of gestation when the fetal lung terminal sacs are developing. 19 In this study, preterm labor was quite high. This is similar to the findings of Figueroa et al in 2022 which found that 31.8% of oligohydramnios patients experienced preterm labor, while the group without oligohydramnios experienced preterm labor as much as 11.4%. Preterm delivery in pregnant women with oligohydramnios is usually planned with induction or caesarean section to prevent further complications for the mother and fetus. 2,19 Oligohydramnios is associated with a risk of maternal and fetal morbidity. This risk occurs secondary to cord compression and potential utero-placental insufficiency. 20 The management and prognosis of oligohydramnios varies widely depending on the underlying etiology, gestational age at diagnosis, and the severity of oligohydramnios. 19 In this



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study, four samples experienced fetal death. Research by Figueroa et al in 2020 found fetal and neonatal outcomes related to oligohydramnios including stillbirth (12.85%), neonatal death <28 days (8.57%), low birth weight (3.07%) and premature birth (4, 23%). 2 All study subjects were given amnioinfusion therapy. Amnioinfusion is a treatment for oligohydramnios. When a lack of amniotic fluid is the only problem, infusion of fluid into the amniotic cavity is a simple therapy that makes sense. In this study most of the subjects still had good outcomes after amnioinfusion. Research by Dhiviya et al in 2020 stated that there was a decrease in the incidence of fetal distress and an increase in perinatal outcomes in the group given amnioinfusion therapy. APGAR scores were also found to be better in pregnant women who were given amnioinfusion therapy. 5,6 The theoretical benefits of amnioinfusion or introduction of physiologic solutions into the amniotic cavity are proposed by three mechanisms. First, amnioinfusion provides dilution of pre-existing intraamniotic bacteria. Second, amnioinfusion washes and dilutes inflammatory cells and mediators (prostaglandins, leukotrienes, cytokines, interleukins, among others). Finally, amnioinfusion increases intra-amniotic fluid volume and intrauterine pressure. In theory, washing or diluting pre-existing intra-amniotic bacteria and inflammatory cells is beneficial to prolong the latency period and the presence of fluid may promote lung expansion and prevent positional contractures. Several additional secondary benefits have been proposed and include increased ability to test fetal genetics, improved ultrasound imaging and reduced risk of cord compression. 5,21 cytokines, interleukins, among others). Finally, amnioinfusion increases intra-amniotic fluid volume and intrauterine pressure. In theory, washing or diluting pre-existing intra-amniotic bacteria and inflammatory cells is beneficial to prolong the latency period and the presence of fluid may promote lung expansion and prevent positional contractures. Several additional secondary benefits have been proposed and include increased ability to test fetal genetics, improved ultrasound imaging and reduced risk of cord compression. 5,21 Washing or diluting pre-existing intra-amniotic bacteria and inflammatory cells is beneficial for prolonging the latency period and the presence of fluid may promote lung expansion and prevent positional contractures. Several additional secondary benefits have been proposed and include increased ability to test fetal genetics, improved ultrasound imaging and reduced risk of cord compression. 5,21 Washing or diluting pre-existing intra-amniotic bacteria and inflammatory cells is beneficial for prolonging the latency period and the presence of fluid may promote lung expansion and prevent positional contractures. Several additional secondary benefits have been proposed and include increased ability to test fetal genetics, improved ultrasound imaging and reduced risk of cord compression. 5,21

## CONCLUSION

In this study, it was found that most pregnant women with oligohydramnios were aged 20-35 years, had high school education, were multipara, diagnosed in the second and third trimesters. Causes of oligohydramnios include congenital abnormalities and premature rupture of membranes. Oligohydramnios carries a high risk for premature birth and fetal death. Amnioinfusion is useful both diagnostically and therapeutically. In addition to improving fetal outcome, amnioinfusion may assist in establishing the diagnosis.



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