

## THE OBSTETRIC OUTCOMES OF OLIGOHYDRAMNIOS IN FULL-TERM PREGNANCIES AT CAN THO CENTRAL GENERAL HOSPITAL IN 2023 - 2024

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### ABSTRACT

**Background:** Oligohydramnios is a crucial maternity issue that increases the risk factors for fetal distress and difficult delivery. **Objectives:** To describe the clinical and subclinical features of oligohydramnios and to evaluate the pregnancy outcomes in full-term pregnancies with oligohydramnios at Can Tho Central General Hospital. **Materials and methods:** The study used a cross-sectional descriptive design involving 50 pregnant women diagnosed with oligohydramnios at Can Tho Central General Hospital from July 2023 to December 2024. **Results:** 3.27% of pregnant women were diagnosed with oligohydramnios. The average age of the pregnant women studied was  $27.32 \pm 7.4$  years old. The majority were  $< 35$  years old, with 82%. The group with amniotic fluid index of 3-5 cm accounted for 76%, and the group with amniotic fluid index of  $< 3$  cm accounted for 24%. The rate of caesarean section and vaginal delivery accounted for 82% and 18%, respectively. The indication for caesarean section is due to fetal distress, accounting for 70.7%. The mean birth weight was  $2850 \pm 407.7$  g. The rate of newborns with an Apgar score at 1 minute less than 7 was 8%. There was an association between an Apgar score at 1 minute and the degree of oligohydramnios ( $p < 0.05$ ). **Conclusion:** Oligohydramnios, though not highly prevalent, pose diagnostic challenges due to nonspecific clinical symptoms and is only detectable via ultrasound. Its impact on pregnancy outcomes is significant and potentially severe. Therefore, regular prenatal checkups and early detection are crucial for timely intervention to minimize complications for both mother and infant.

**Keywords:** Oligohydramnios, pregnancy full-term, results of obstetric.

### I. INTRODUCTION

Amniotic fluid is one of the important accessories of pregnancy. It's not just a liquid in which the fetus floats; it also contains nutrients, hormones, antibodies, and other components that play an important role in fetal development and protection. The amniotic fluid constantly circulates as the fetus swallows and then excretes it. For many years, the importance of amniotic fluid in pregnancy has been recognized. Any disorders of amniotic fluid increase the rate of perinatal and maternal morbidity and mortality. Among these, oligohydramnios (low amniotic fluid) is a common condition in the third trimester and is often associated with a 5.2-fold higher risk of fetal distress during labor compared with those without oligohydramnios [1]. Most cases of oligohydramnios are asymptomatic and can only be diagnosed by ultrasound. The incidence rate of oligohydramnios varies from 0.5 to 5% depending on the studied population and its definition [2]. Due to these risks, oligohydramnios has become an important factor that clinicians need to monitor to ensure

a successful pregnancy. However, the management of oligohydramnios is still not universally agreed upon among obstetricians. Some opt for caesarean section, while many other reports indicate that vaginal delivery can be safe in certain conditions. In Germany, a 2022 study analyzing nearly 9,000 pregnant women found that approximately 2.19% of women experienced oligohydramnios, with a 2.07-fold higher rate of caesarean delivery and significantly lower fetal birth weight compared to the group with normal amniotic fluid volume [3]. Therefore, to better understand the rate and outcomes of oligohydramnios, thereby contributing to early diagnosis and management, we conducted the study “The obstetric outcomes of oligohydramnios in full-term pregnancies at Can Tho Central General Hospital in 2023-2024”.

## II. MATERIALS AND METHODS

### 2.1. Materials

50 full-term pregnant women diagnosed with oligohydramnios were admitted for delivery at the Obstetrics Department of Can Tho Central General Hospital from July 2023 to December 2024.

**- Inclusion criteria:** Pregnant women with singleton pregnancies, cephalic presentation, gestational age  $\geq 37$  weeks to  $< 42$  weeks calculated from the first day of the last menstrual period (regular menstrual cycle) or calculated according to the estimated due date on ultrasound in the first trimester, intact amniotic membranes, and diagnosed with oligohydramnios (amniotic fluid index  $\leq 5$  cm on ultrasound) admitted for delivery at the Obstetrics Department of Can Tho Central General Hospital from July 2023 to December 2024.

**- Exclusion criteria:** Pregnant women with acute illnesses: systemic infections, pulmonary tuberculosis, hepatitis, or oligohydramnios due to ruptured membranes. Fetal and placental factors: macrosomia (estimated fetal weight  $\geq 4000$  g), abnormal presentation, placenta previa, placental-cord abnormalities.

### 2.2. Methods

**- Research design:** A cross-sectional descriptive design

**- Sample size:** All full-term pregnant women diagnosed with oligohydramnios admitted to the Obstetrics Department who meet the inclusion criteria were included. Over the study period, we surveyed 50 full-term pregnant women diagnosed with oligohydramnios admitted to the Obstetrics Department of Can Tho Central General Hospital from July 2023 to December 2024.

#### **- Research content**

+ Determine the rate of oligohydramnios among the total number of full-term pregnant women admitted to the hospital.

+ Describe the clinical and subclinical features of oligohydramnios.

+ Evaluate maternal pregnancy outcomes: results and methods of delivery termination; reasons for caesarean section; complications.

+ Evaluate fetal pregnancy outcomes: 1-minute and 5-minute Apgar scores, infant birth weight, and complications in the infant. The relationship between the mode of delivery and the 1-minute Apgar score of the infant.

**- Data collection:** Through a data collection form.

**- Data processing:** Data is processed using SPSS 20.0 software.

### III. RESULTS

During the study period from 07/2023 to 12/2024; 1,529 pregnant women agreed to participate in the study. We recorded 50 pregnant women with oligohydramnios, accounting for 3.27%. These cases were monitored during their labor and delivery process at the Obstetrics Department of Can Tho Central General Hospital. The results are as follows:

#### 3.1. Characteristics of research subjects

Table 1. Maternal Age

Group age	Frequency (n = 50)	Rate (%)
< 35 years	41	82
≥ 35 years	9	18
X ± SD		27.32 ± 7.4

In our study, the average maternal age was  $27.32 \pm 7.64$  years. The majority of study subjects were distributed in the age group < 35 years, with a rate of 82%.

Table 2. Obstetric characteristics

Obstetric characteristics	Frequency (n = 50)	Rate (%)
Gravidity	Primigravida	28
	Multigravida	22
Antenatal care	< 4	1
	≥ 4	49
Gestational age (weeks)	37- < 40	43
	40- < 42	7
Preeclampsia	Yes	9
	No	41

The rate of primiparous mothers (56.0%) was higher than that of multiparous mothers (44.0%) in the study group. The majority of the study subjects had four or more prenatal visits (98.0%), indicating a concern for prenatal health care. Most of the study subjects had a gestational age between 37-40 weeks (86.0%), with the post-term group accounting for 14.0%. The rate of study subjects diagnosed with preeclampsia during pregnancy was quite low, at 18.0%.

#### 3.2. The rate and degree of oligohydramnios

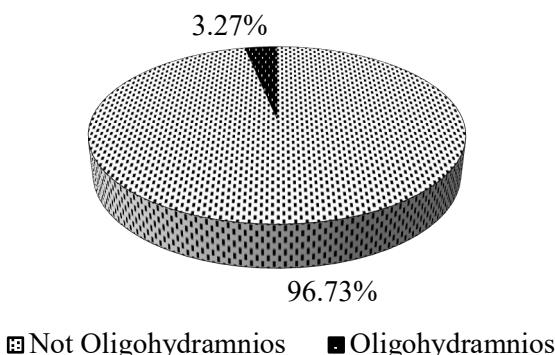


Figure 1. The rate of oligohydramnios

In our study, the rate of oligohydramnios was 3.27%.

Table 3. The degree of oligohydramnios

Degree of oligohydramnios	Frequency (n)	Percentage (%)
3-5 cm	38	76%
< 3 cm	12	24%

The group with an amniotic fluid index from 3 to 5 cm accounts for 76.0%, while the group with an amniotic fluid index  $\leq$  3 cm accounts for 24.0%.

### 3.3. Maternal outcome of oligohydramnios

Table 4. Maternal outcome

Mode of delivery	Frequency (n = 50)	Rate (%)
Vaginal delivery	9	18
Caesarean section	41	82
Indication for caesarean section	n = 41	
Fetal distress	29	70.7
Labor dystocia	3	7.3
Others	9	22

In our study, caesarean sections account for the majority, with a rate of 82%. The primary reason for surgery was fetal distress, accounting for 29 out of 41 cases (70.7%). There were 3 out of 41 cases (7.3%) due to labor dystocia. Other indications, such as previous caesarean sections, abnormal fetal positions, placental abruption, etc., accounted for 22%.

### 3.4. Perinatal outcome of oligohydramnios

Table 5. Perinatal outcome

		Frequency (n = 50)	Rate (%)
1st minute APGAR	< 7	4	8
	$\geq$ 7	46	92
5th minute APGAR	< 7	0	0
	$\geq$ 7	50	100
Birth weight	< 2500 g	7	14
	$\geq$ 2500 g	43	86
Admission to NICU	Yes	4	8
	No	46	92

According to the table above, the first-minute Apgar was less than 7 in 4 (8%). All the neonates had an Apgar score  $\geq$  7 at 5 minutes after birth. 86% of neonates weighed  $\geq$  2.5 kg. 8% of the neonates were referred to NICU.

Table 6. Perinatal complication in oligohydramnios

1st minute APGAR	Degree of oligohydramnios		p*
	3-5 cm	< 3 cm	
< 7	1 (25)	3 (75)	0.038
	37 (80.4)	9 (19.6)	

(\*) Fisher's Exact Test

In our study, there was an association between an Apgar score at 1 minute and the degree of oligohydramnios ( $p < 0.05$ ).

Table 7. The relationship between the first-minute Apgar score and mode of delivery

Mode of delivery	1st minute Apgar score		p*
	< 7	≥ 7	
Vaginal delivery	0 (0)	9 (19.6)	1.0
Caesarean section	4 (100%)	37 (80.4)	

(\*) Fisher's Exact Test

According to the table above, no significant correlation was found between mode of delivery and an Apgar score at 1 minute.

## IV. DISCUSSION

### 4.1. Characteristics of research subjects

The average age of the pregnant women studied was  $27.32 \pm 7.4$  years old. The majority were  $< 35$  years old, with 82%, possibly because this falls within the childbearing age group. In the study by Can Ba Quat (2023), the average age of pregnant women with oligohydramnios was  $27.7 \pm 5.3$  years, with the 20-34 age group accounting for 86.6%. These results are similar to those of our study [4]. However, these data only show the maternal age characteristics of the study group and do not indicate the extent to which maternal age affects the risk of oligohydramnios during pregnancy.

Regarding obstetric characteristics, the rate of primiparous mothers was 56%, higher than that of multiparous mothers at 44%. This result is also similar to studies by Can Ba Quat (2023) [4]. Meanwhile, a study by Jil Karia *et al.* in India (2022) showed that the rate of oligohydramnios in multiparous pregnancies was 57% [5]. In contrast, the study by Shreen S. Mohammed *et al.* (2024) reported a rate of 78.0% [6]. Oligohydramnios occurs in 86% of pregnancies at term. In pregnancies of more than 40 weeks and less than 42 weeks of gestation, the incidence was 14%, of which up to 25% of cases had an AFI  $< 3$  cm. This result is consistent with the study by Jil Karia *et al.* (2022) [5]. Compared to Ninh Van Minh's study (2013), the rate of pregnancies  $> 41$  weeks with oligohydramnios reached 27.4%, and over 50% of those had an AFI  $< 4$  cm [7]. However, the study by Ninh Van Minh focused on pregnancies from 28 weeks onwards, while our study was conducted on pregnancies from 37 weeks onwards. On the other hand, with the current advancements in pregnancy management, health education for pregnant women, and the improvement in public awareness, the majority of pregnant women come to the hospital at full term. There are fewer cases of post-term pregnancies, resulting in a lower rate of post-term pregnancies in our study. In general, both studies show that the further past the estimated due date the pregnancy progresses, the greater the risk of oligohydramnios. This is consistent with Phelan's research, which indicates that amniotic fluid volume gradually decreases as the pregnancy progresses from 37 to 41 weeks, at a rate of 10 ml per week, and decreases by 33% in post-term pregnancies [8]. In the oligohydramnios group, preeclampsia accounted for 18%, which is similar to the study by Jil Karia *et al.* (2022) with a rate of 17% [5]. While Pham Chi Kong's study (2023) reported a 9% prevalence of maternal pregnancy complications, including preeclampsia [9], this rate is lower than in our study because his research was conducted on pregnancies beyond 38 weeks.

### 4.2. The rate and degree of oligohydramnios

The rate of oligohydramnios was 3.27%. This result is similar to the studies by Pham Chi Kong (2.2%) [9], Pham Thi Thu Hong (4.1%) [10], and Ninh Van Minh (2.1%) [7], but

lower than the result of Lam Duc Tam (14.11%) [11]. Differences in rates between studies may be due to variations in the study population, different diagnostic criteria, and the techniques of the ultrasound operators at the medical facilities conducting the research.

#### 4.3. Maternal outcome of oligohydramnios

The management and prognosis of oligohydramnios vary greatly depending on available medical equipment, the experience of obstetricians, the progression of the pregnancy, etc. In our study, caesarean section was the predominant mode of delivery, accounting for 82% of cases. This rate is consistent with studies by Can Ba Quat (85.1%) [4], Lam Duc Tam (82.56%) [11], and Lei Hou *et al.* (84.4%) [12]; this rate is higher than the studies by Pham Thi Thu Hong (64.4%) [10] and Pham Chi Kong (only 58.6%) [9]. Among these, the most common cause was fetal distress, accounting for 70.7%, followed by labor dystocia at 7.3% and other causes such as abnormal presentation, previous caesarean section, etc. The highest rate of fetal distress in our study aligns with the theory that oligohydramnios reduces uterine volume, and during labor, contractions cause the fetus to be constricted and the umbilical cord to be compressed, leading to acute fetal distress. However, the most common reason for caesarean section was labor dystocia in Pham Thi Thu Hong's study [10]. The difference in this rate could be due to several factors, such as differences in sample selection criteria and variations in experience and monitoring equipment across medical facilities.

#### 4.4. Perinatal outcome of oligohydramnios

Birth asphyxia is the major complication in oligohydramnios. From a study of 50 infants born to mothers with oligohydramnios, the results showed that neonatal asphyxia according to the 1-minute Apgar score was 8.0%, the 5-minute Apgar score was 100%  $\geq$  7 points; birth weight  $<$  2500 g accounted for 14.0%, and 4 infants were admitted to NICU, with no cases of neonatal death. Similarly, according to Can Ba Quat's research on 139 infants born to mothers with oligohydramnios, neonatal asphyxia based on the 1-minute Apgar score accounted for 7.2%, and 5 out of 10 infants with respiratory distress required intervention [4]. Based on research by Jil Karia *et al.*, the rate of neonates with an Apgar score  $<$  7 at 1 minute was 7%, and at 5 minutes was 4%. Low birth weight ( $<$  2500 g) accounted for 39% and 41% of the neonates admitted in NICU [5]. Despite the difference in results, this indicates that there is a significant association between the degree of oligohydramnios and a 1-minute Apgar score  $<$  7 ( $p < 0.05$ ). Additionally, according to the statistical test in the study, there was no significant difference in the 1-minute Apgar score between the two groups of vaginal delivery and caesarean section, with  $p > 0.05$ . Therefore, the mode of delivery may not be a factor affecting the 1-minute Apgar score.

### V. CONCLUSION

The rate of oligohydramnios was 3.27%, which was similar to some other studies. The majority of pregnant women with oligohydramnios were in the age group  $<$  35 years old. There is a correlation between gestational age and the risk of oligohydramnios; the more overdue the pregnancy, the higher the risk of oligohydramnios. Preeclampsia is a risk factor for oligohydramnios. Caesarean sections accounted for 82%, while vaginal births accounted for 18%. The most common reason for caesarean sections was fetal distress, at 70.7%. There is a correlation between the degree of oligohydramnios and the 1-minute Apgar score ( $p < 0.05$ ), while the mode of delivery does not affect the 1-minute Apgar score ( $p > 0.05$ ).

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