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Original Article

A COMPARATIVE STUDY TO ASSESS THE RELATIONSHIP BETWEEN AMNIOTIC FLUID INDEX AND PERINATAL OUTCOME AMONG THE MOTHERS WITH NORMAL AMNIOTIC FLUID INDEX AND OLIGOHYDRAMNIOS

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ABSTRACT

Amniotic fluid is a liquid of a clear or a little yellow colour that is found in the uterus of the pregnant women. Assessment of the amniotic fluid is an integral part of antenatal ultrasound evaluation during screening exams, to assess fetal well being. Studies have showed a strong association between low amniotic fluid index (AFI) and adverse outcomes. The present study was undertaken to compare the perinatal outcome among mothers with normal AFI and mothers with oligohydroamnios. Hundred samples were selected, 50 mothers with normal AFI and 50 with oligohydroamnios by using purposive sampling technique .The tool consisted of three part - Socio demographic variables, Checklists and Recording sheets to assess the maternal and neonatal outcome. Reliability was established by inter rater method and the reliability of the tool was 0.8. Research findings of the study revealed that 50(100%) mothers with normal AFI had good perinatal outcome where as in case of mothers with oligohydroamnios 45 (90%) had good maternal outcome and 5 (10%) had poor maternal outcome. In neonates 45 (90%) mothers with normal AFI had good neonatal outcome and 5(10%) had poor neonatal outcome where as in case of mothers with oligohydroamnios 45 (90%) had poor neonatal outcome and 5(10%) had good neonatal outcome. The mean value for mothers with normal AFI was 11.7 (1.31) and in mothers with oligohydroamnios mean value was 9.22 and standard deviation 0.70; 't' value was calculated 11.81*. The mean value of neonatal outcome is 11.76 and standard deviation was 2.67 and in neonates of mothers with oligohydroamnios mean value was 4.42 and standard deviation was 1.88; 't' value was 15.96*. As per the association between the perinatal outcome and selected socio demographic variables, monthly family income had an association with neonatal outcome in mothers with normal AFI. No other variables were significantly associated with the maternal and neonatal outcome. The present study concluded that there is a significant difference between perinatal outcome of mothers with normal AFI and mothers with oligohydroamnios. Efforts should be made to prevent oligohydroamnios in mothers to improve perinatal outcome.

Key words: Amniotic fluid Index, Perinatal outcome, Oligohydroamnios, Maternal outcome, Neonatal outcome.

INTRODUCTION:

Background of study Pregnancy is a unique, exciting and often joyous time in a women's life, as it highlights the women's amazing creative and nurturing powers, while providing a bridge to the future. The growing fetus depends entirely on its mothers healthy body for all needs. Consequently, pregnant women must take steps to remain as healthy and well nourished as they possibly can. Antenatal tests are done to evaluate fetus for health and the risk of adverse outcomes during the course of a pregnancy. Amniotic fluid is an important part of pregnancy which plays a vital role in the normal growth of fetus and promotes muscular – skeletal development and allows for easier fetal movement. The mechanism of amniotic fluid production, consumption, composition and volume depends on the gestational age. During the first trimester the major source of amniotic fluid is from the maternal blood within the uterine wall and secretion from amnion. It increases rapidly in the first half of pregnancy and the end of the first

trimester it is 100 to 150 ml at 16 weeks and 700 ml at 32 weeks. Then it increases slowly to the maximum volume of 800 to 1000 ml at 37 weeks, thereafter declines gradually to 700 – 800 ml at 40 weeks. After 40 weeks amniotic fluid decreases at a rate of 8% per week and averages only 400 – 450 ml at the end of 42 weeks. It reduces further to a mean of 250 ml and 160 ml at 43 & 44 weeks. The study of amniotic fluid provides useful information about the well being and also maturity of the fetus. Oligohydramnios is the condition having a little amniotic fluid. It is a complication in approximately 4.5% of all pregnancies and severe Oligohydramnios is a complication in 0.7% of pregnancies. Oligohydramnios is more common in pregnancies beyond term, as the amniotic fluid volume decreases at term. Amniotic fluid index is a four quadrant technique as described by Phelan in (1987).Amniotic fluid index is one of the major and deciding components of fetal biophysical profile and by itself it can predict pregnancy outcome. Amniotic fluid assessment by ultrasound is one of the important tool to assess fetal health in all risk categories like:- very low values are associated with intrauterine growth restriction and renal anomalies of fetus, where as high values may indicate fetal gastro intestinal anomalies, maternal diabetic mellitus and so forth. However, before deciding the cut off standards for abnormal values for a local population, what constitutes a normal range for specific gestational age and the ideal interval of testing should be defined.

OBJECTIVES

1. To assess the amniotic fluid index among the mothers.
2. To assess the perinatal outcome among the mothers with normal amniotic fluid index and oligohydramnios.
3. To compare the perinatal outcome among the mothers with normal amniotic fluid index and oligohydramnios.
4. *To find association between perinatal outcome among mothers with normal amniotic fluid index and oligohydramnios with their selected socio demographic variables*

MATERIALAND METHODS

To assess the relationship between amniotic fluid index and perinatal outcome among the mothers with normal amniotic fluid index and oligohydramnios among mothers in selected hospitals in Jalandhar, Punjab. Purposive sampling technique was used to select study subjects (100). Samples were selected with non randomized method. A self structured checklist was used developed in English. Seven experts from the field of obstetric and gynecological nursing determined the content validity of the tool. The reliability of the tool was tested by inter rater method, tool was found reliable. Internal consistency of the tool was (r = 0.8). Pilot study was conducted on the ten study participants to check the clarity, feasibility and practicality of the study. Investigator filled the tool by asking and observing each respondent and the time taken for each respondent of an average was 1 hrs. Ethical clearance to conduct study was obtained from institutional committee of S.G.L. College of nursing. The permission for data collection was obtained from the concerned authority, the investigator assured the anonymity to the study participants, and their consent was obtained. The data has been collected from 100 mothers who fulfill the sampling criteria in the month of March 2017.

RESULTS

SECTION 1

TABLE 1 Description of socio demographic variables

N = 100

Socio Demographic Variables	Normal Amniotic fluid Index mothers $n_1 = 50$		Oligohydroamnios Mothers $n_2=50$	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1. Age (in Yrs.)				
a. 18-23	13	26	11	22
b. 24-29	33	66	33	66
c. 30-35	4	8	6	12
d. 36 and above	0	0	0	0
2. Educational Status				
a. No formal education	4	8	5	10
b. Primary	9	18	14	28
c. Secondary	19	38	20	40
d. Senior Secondary	15	30	8	16
e. Graduation and above	3	6	3	6
3. Gravida				
a. Primigravida	31	62	30	60
b. Multigravida	19	38	20	40
4. Parity				
a. One	31	62	30	60
b. Two	17	34	17	34
c. Three	2	4	3	6
d. > Three	0	0	0	0
5.Type of family				
a. Nuclear	27	54	35	70
b. Joint	19	38	12	24
c. Extended	4	8	3	6
6. Dietary pattern				
a. Vegetarian	28	56	27	54
b. Mixed diet	22	44	23	46
7. Monthly family income (in Rs.)				
a. <10000	12	24	14	28
b. 10001-20,000	27	54	27	54
c. 20001-30,000	7	14	6	12
d. >30,001	4	8	3	6

The above table 1 depicts the distribution of normal amniotic fluid index mothers and oligohydramnios mothers according to the sample characteristics like age, educational status, gravida, parity, type of family, dietary income, monthly family income. According to age, the majority 33(66%) mothers with normal amniotic fluid belonged to the age group 24 -29 years. whereas, minority 4(8%) were from the age group 30-35 years. In case of mothers with Oligohydramnios the majority 33(66%) belonged to the group 24 -29 years, whereas 6 (12%) were from the age group of 30 -35 years. that in relation to the educational status, maximum mothers with normal amniotic fluid index 19(38%) had senior secondary education and minority 3(6%) had graduation. In relation to educational status of mothers with oligohydroamnios majority 20(40%) had secondary education and minimum number 3(6%) had graduation and above. ***A***ccording to Gravida 31 (62%) mothers with normal amniotic fluid index were Primigravida and 19(38%) were multigravida. Whereas 30(60%) mothers with oligohydroamnios were Primigravida and 20 (40%) were multi gravida. ***A***ccording to parity 31(62%) mothers with normal amniotic fluid index were primipara and 2(4%) were multiparous, Whereas 30(60%) mothers with oligohydroamnios were primipara and 17(34%) and 3(6%) were with parity 3 or two respectively. ***I***n relation to type of family 27(54%) mothers with normal amniotic fluid index were from nuclear family and 4(8%) were from extended family, whereas 35(70%) mothers with oligohydroamnios were from nuclear family and 3(6%) were from joint families. ***A***ccording to the dietary pattern 28(56%) mothers with normal amniotic fluid index were vegetarian and 22(44%) were taking mixed diet, whereas 27(54%) mothers with oligohydroamnios were vegetarian and 23(46%) were taking mixed diet. ***I***n relation to monthly family income, most of mothers with normal amniotic fluid index, 27(54%) had Rs. 10,001 – 20,000 monthly family income and least 4(8%) had RS. >30,000 monthly family income. In case of other group, 27(54%) mothers with oligohydroamnios had Rs.10,001 – 20,000 monthly family income and least 3(6%) had Rs. ≥30,001 monthly income.

SECTION – II

Table 2: Assessment of amniotic fluid index

N = 100

Groups	Amniotic fluid Index (cm)	f	%
Mothers with normal amniotic fluid index	8 -11	21	42
	12 -15	19	38
	16 -18	10	20
Mothers with Oligohydroamnios	0 -3	13	26
	4 -5	37	74

Table 2 depicts that out of 100 samples, 50 mothers were with normal amniotic fluid index and 50 with oligohydroamnios. In case of mothers with normal amniotic fluid index, majority 19 (38%) mothers had amniotic fluid index in between 12 -15cm and 10(20%) has the amniotic fluid index between the 16 to18cm cases. In case of oligohydroamnios 37(74%) mothers had the amniotic fluid index between the 4-5 cm and 13(26%) had between 0-3 cm.

SECTION III

Analysis of assessment of perinatal outcome among mothers with normal amniotic fluid index and mothers with oligohydroamnios

Part 1 (Table 3) :- Maternal outcome (frequency and percentages distribution)

N = 100

Groups	Poor outcome (0 -6)		Good outcome (7 -12)		Mean	SD
	(f)	(%)	(f)	(%)		
Mothers with normal amniotic fluid index	0	0	50	100	11.7	0.70
Mothers with oligohydroamnios	5	10	45	90	9.22	1.313

Table 3 depicts that among 50 mothers with normal amniotic fluid index, everyone (100%) had good maternal outcome where the mean maternal score was 11.7 and standard deviation was 0.70. Whereas among 50 mothers with oligohydroamnios 90% had good outcome and 10% had poor maternal outcome where the mean maternal score in mothers with oligohydroamnios was 9.22 and standard deviation was 1.313.

Part 2 (Table 4) :- Neonatal outcome (Frequency and percentages distribution)

N = 100

Groups	Poor outcome (0 -6)		Good outcome (7 -13)		Mean	SD
	(f)	(%)	(f)	(%)		
Mothers with normal amniotic fluid index	5	10	45	90	11.76	2.67
Mothers with oligohydroamnios	45	90	5	10	4.42	1.88

Table 4 depicts that among 50 mothers with normal amniotic fluid index 90% had good and 10% had poor neonatal outcome and their mean neonatal score was 11.76 and standard deviation was 2.67. It is also shown that among 50 mothers with oligohydroamnios 90% had poor and only 10% had good neonatal outcome where thin mean neonatal score was 4.42 and standard deviation was 1.88.

SECTION IV: Analysis of comparison of perinatal outcome among the mothers with normal amniotic fluid index and mothers with oligohydroamnios.

Part1 (Table 5):- Comparison of maternal outcome in mothers with normal amniotic fluid index and mothers with oligohydroamnios**.**

Groups	Mean	SD	t value	Df
Mothers with normal amniotic fluid index	11.7	0.70		
Mothers with oligohydroamnios	9.22	0.313	11.81*	98

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Maximum scores = 12
Minimum scores = 00

Table 5 depicted that among 50 mothers with normal amniotic fluid index the mean maternal score was 11.7 and standard deviation was 0.70 and the mean maternal score in mothers with oligohydroamnios was 9.22 and standard deviation was 1.313. The t value was found out to be 11.81 at 98 degree of freedom. Thus it can be concluded that there is a significant difference in the maternal outcome of mothers with normal amniotic fluid index mothers and mothers with oligohydroamnios.

Part 2 (Table 6):- Comparison of neonatal outcome in mothers with normal amniotic fluid index and mothers with oligohydroamnios.

N = 100

Groups	Mean	SD	t value	Df
Mothers with normal amniotic fluid index	11.76	2.67		
Mothers with oligohydroamnios	4.42	1.88	15.96*	98

Maximum scores = 13
Minimum scores = 00

Table 6 depicted that among 50 mothers with normal amniotic fluid index the mean neonatal score was 11.76 and standard deviation was 2.67 and the mean neonatal score in mothers with oligohydroamnios was 4.42 and standard deviation was 1.88. The t value was found out to be 15.96 at 98 degree of freedom. Thus it can be concluded that there is a significant difference in the neonatal outcome of mothers with normal amniotic fluid index and mothers with oligohydroamnios

(Table 7) :- Description of perinatal outcome characteristics

S.NO	Perinatal outcome characteristics	Mothers with normal amniotic fluid index $n_1 = 50$		Mothers with oligohydroamnios $n_2 = 50$	
		f	%	F	%
	Maternal outcome				
1	Normal Temperature	47	94	43	86
2	Normal Pulse	49	98	47	94
3	Normal Respiration	49	98	43	86
4	Normal Blood pressure	41	82	34	68
5	Normal Amniotic fluid index	50	100	00	00
6	Normal vaginal delivery	50	100	00	00
7	Prolonged labour	02	04	00	00
8	Obstructed labour	00	00	00	00
9	Forceps delivery	00	00	01	02
10	Maternal hypoxia	01	02	03	06

10	Maternal hypoxia	01	02	03	06
11	Primary PPH	00	00	01	02
12	Operative interference of delivery	00	00	00	00
	Neonatal outcome				
1	Normal Length of neonate	45	90	18	36
2	Normal Birth weight	46	92	19	38
3	Normal Head circumference	43	86	01	02
4	Normal Chest circumference	43	86	01	02
5	Normal APGAR score	50	100	39	78
6	Normal Ballard score	42	84	09	18
7	Congenital malformation	00	00	03	06
8	Fetal death	00	00	03	06
9	NICU Admissions	10	20	45	90
10	Meconium stained amniotic fluids	03	06	15	30
11	Birth asphyxia	05	10	34	68

Table 7 depicts that 47 mothers in normal amniotic fluid index and 43 mothers with oligohydroamnios had normal temperature, 49 mothers in normal amniotic fluid index and 47 mothers with oligohydroamnios had normal pulse, 49 mothers with normal amniotic fluid index and 43 mothers with oligohydroamnios had normal respiration, 41 mothers in normal amniotic fluid index and 34 mothers with oligohydroamnios had normal blood pressure.

Normal vaginal delivery was seen in all of the mothers with normal amniotic fluid index. Prolonged labour was seen in 2 mothers and maternal hypoxia in one mother with normal amniotic fluid index, where as forceps delivery , maternal hypoxia, primary PPH was seen in 1, 3and 1 in mothers with oligohydroamnios respectively. None of the mothers of both groups had obstructed labor and operative interference of delivery.

Normal length of neonates, normal birth weight, normal head circumference and chest circumference was seen in 45,46,43and 43 neonates of mothers with normal amniotic fluid index respectively, where as Normal length of neonates, normal birth weight, normal head circumference and chest circumference was seen in 18,19,01 and 1 neonates with oligohydroamnios respectively. All the babies of mothers with normal amniotic fluid index had normal APGAR scores where as only 39 babies of mothers with oligohydroamnios had normal APGAR scores.

Normal Ballard scores was seen in 42 neonates of mothers with normal amniotic fluid index as compared with 9 neonates of mothers with oligohydroamnios. None of the neonate in normal group had congenital anomalies and fetal death, where as in oligohydroamnios group 3 neonates had congenital formation and fetal death. NICU admission were required in 10 neonates of mothers with normal amniotic fluid index and 45 neonates of mothers with oligohydroamnios, Meconium stained amniotic fluid and birth asphyxia was seen 3 and 5 neonates in normal amniotic fluid index group respectively compared to 15 and 34 neonates in oligohydroamnios group.

DISCUSSION

The present study was conducted to assess the relationship between amniotic fluid index and perinatal outcome among the mothers with normal amniotic fluid index and oligohydramnios. Present study showed that mothers with normal amniotic fluid index 90% had good and 10% had poor neonatal outcome and their mean neonatal score was 11.76 and standard deviation was 2.67. It is also shown that mothers with oligohydroamnios 90% had poor and only 10% had good neonatal outcome where thin mean neonatal score was 4.42 and standard deviation was 1.88. Similar study finding showed that the study was congruent with the study conducted by **Sundari M.T., Himabundu P., Pavani S., Sairam M.V., (2012),** a prospective study among 100 pregnant women attending antenatal clinic in Govt. Hospital Vijayanagar to assess the perinatal outcome in relation to amniotic fluid index in high risk pregnancies who were randomly selected. The study showed that 6 mothers had AFI <5cm, 84 had 5-9cm and 10 had >10cm. Study concluded that Severe oligohydramnios (AFI < 5 cm) in the presence of IUGR or prolonged gestation is associated with significant increase in perinatal morbidity and mortality.

LIMITATIONS:

- The present study was limited to only 100 samples.
- The present study had no intervention to improve the perinatal outcome in mothers with oligohydroamnios.

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CONFLICT OF INTERST

Authors do not have any relationship/ condition/circumstances that present potential conflicts of interest.

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