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## Abnormal liquor volume and mode of delivery

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### ABSTRACT

**Introductions:** Sonographic assessment of four quadrant measurement of amniotic fluid index (AFI) is an integral part of antenatal evaluation of pregnancies, especially in the third trimester. Decreased (oligohydramnios, AFI 0-9.9 cm) or increased (polyhydramnios >25 cm) increases the risk of intrauterine growth retardation, birth asphyxia and induction or operative interference. The aim of this study was to analyse abnormal liquor volume and mode of delivery.

**Methods:** This retrospective cross-sectional study analysed the cases of abnormal liquor volume in term pregnancies during 2013-2016 at Patan Hospital. Patient's files were traced from medical record section. We analysed the abnormal liquor volume based on amniotic fluid index (AFI) and the mode of deliveries.

**Results:** Among 15,272 term pregnancies scanned, 130 had abnormal AFI, 128 oligohydramnios and 2 polyhydramnios. Out of 128 oligohydramnios, 40 (30.8%) were severe, 54 (41.5%) moderate and 34 (26.2%) mild. Two cases had polyhydramnios. The emergency lower uterine segment caesarean sections (emLSCS) were performed in 99 (76.1%) oligohydramnios.

**Conclusions:** This study suggests that oligohydramnios measured by AFI at term pregnancy required more emLSCS.

**Keywords:** amniotic fluid index, oligohydramnios, polyhydramnios, emergency caesarean sections, spontaneous vaginal deliveries

## Introductions

Amniotic fluid assessment is an integral part of the antenatal evaluation of pregnancies at risk especially in the third trimester.<sup>1</sup> This helps to identify the fetus at risk, the risk of neonatal complications and determine the mode of delivery which are the cornerstone of modern day obstetrics.<sup>3</sup> Therefore, accurate assessment of amniotic fluid index (AFI) is an important part of evaluation of fetal wellbeing and AFI is currently the “gold standard” since it is easy to teach and is reproducible<sup>2</sup>. The aim of this study was to analyse the mode of delivery (lower uterine segment caesarean section LSCS and spontaneous vaginal delivery SVD) in patients with abnormal liquor volume (oligohydramnios, polyhydramnios).

## Methods

This was a retrospective cross-sectional study of assessment of amniotic fluid index during antenatal care (ANC) using a four quadrant technique at term pregnancies for 3 years, from 2013 to 2016 from Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Nepal. For the purpose of AFI measurement, the uterine cavity was arbitrarily divided into four quadrants by a vertical and horizontal line running through umbilicus. Linear array transabdominal probe was used to measure the largest vertical pocket (cm) in perpendicular plane to the abdominal skin in each quadrant. The AFI was obtained by

adding these four measurements,<sup>8</sup> and categorised<sup>9</sup> into mild (8-9.9cm), moderate (5-7.9 cm) and severe oligohydramnios (<5 cm). In this study, based on Hospital protocol, we defined severe oligohydramnios ( $\leq 5$  cm AFI), moderate (5.1-8 cm) and mild (8.1-9.9 cm) respectively.

The variables studied in this study were age of the patients, AFI and mode of delivery (LSCS, SVD). All scans were performed in radiology department, on Aloka, Sonosite and Medison machines. Data entry and analysis was done using SPSS Version 20 software.

## Results

In this study, out of 15,272 ANC cases studied at term pregnancy, abnormal liquor was seen in 130 (0.85%). Regarding the parity of 130 abnormal liquor, primigravidae were 68, 2nd gravida 42, 3rd 17 and 4th 3.

In 130 patients, average age was 28 years (range 17 to 38), oligohydramnios 128 (98.5%) and polyhydramnios 2 (1.5%). Among 128 cases of oligohydramnios, 71 (55.5%) were in the age group of less than or equal to 28 years, (Table 1). Out of 128 patients with oligohydramnios, 99 (77.34%) had emLSCS and 29 (22.66%) SVD, (Table 2). Out of 40 cases of severe oligohydramnios, 34 (85%) had emLSCS and 6 (15%) had SVD, (Table 3).

**Table 1. Distribution of oligohydramnios at term pregnancy by age of the patient**

Age	N	%
$\leq 28$ years	71	55.5
$\geq 28$ years	57	44.5
Total	128	100

**Table 2. Mode of delivery in patient with abnormal liquor volume (AFI)**

Mode of Delivery		N	%
emLSCS	Oligo	99	76.9
	Poly	1	
SVD	Oligo	29	23.1
	Poly	1	
Total		130	100

**Table 3. Abnormal liquor and mode of delivery**

Mode of Delivery	Oligohydramnios			Polyhydramnios
	Severe AFI ≤5 cm N (%)	Moderate AFI 5.1-8 cm N (%)	Mild AFI 8.1-9.9 cm N (%)	Poly N (%)
emLSCS	34 (85%)	41 (76%)	24 (71%)	1 (50%)
SVD	6 (15%)	13 (24%)	10 (29%)	1 (50%)
Total	40 (100%)	54 (100%)	34 (100%)	2 (100%)

## Discussions

Among abnormal liquor measured AFI, majority were oligohydramnios 128/130 (98.5%). In our study, based on Hospital protocol severe oligohydramnios (≤5 cm AFI), moderate (5.1-8 cm) and mild (8.1-9.9 cm) were 42 (32.8%), 57 (43.8%) and 29 (22.3%) respectively. In a study, AFI less than or equal to 5 cm cut-off is used to define oligohydramnios.<sup>7</sup> There are various measurements for AFI, severe oligohydramnios AFI <5 cm and moderate 5.1 to 8 cm and normal 8.1-18 cm.<sup>9</sup> AFI changes from 11 through 43 weeks gestation, and is determined by the summation of vertical diameter of the largest pockets in each of the four quadrants.<sup>10,11</sup>

In our study, 99 (77.3%) of oligohydramnios cases underwent emLSCS and surgery rate was less in mild 24 (18.75%) than moderate 41 (32.03%) and severe 34 (26.56%). Similar findings of AFI as a good predictor of maternal and perinatal outcome, with increased incidence of caesarean and instrumental deliveries in oligohydramnios has been reported.<sup>9</sup> Oligohydramnios as seen as an isolated finding leading to increased obstetrical interventions including caesarean.<sup>10</sup> Women with borderline AFI, there is no significant differences in caesarean deliveries for fetal intolerance of labour compared to cases with normal AFI.<sup>7</sup>

In our study, the mean maternal age was 28 years, (range 17-38) similar to other studies with 24.31±3.19 years.<sup>4</sup>

In present study, the caesarean delivery was 77.3% in oligohydramnios, much higher than average total caesarean delivery of 39.15% in

a previous study done at Patan hospital claims.<sup>12</sup>

The main limitations of our study was assessment of AFI on three different machines, and by different operators. Also, exclusion of twin pregnancies, not comparing the study group with the control group with normal AFI and not considering neonatal complications associated with borderline or low AFI.

## Conclusions

Oligohydramnios was the main findings among abnormal liquor volume measured by amniotic fluid index (AFI) at term pregnancy. Three fourth of oligohydramnios patients required emergency cesarean section delivery.

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