International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 11-01-2019; Accepted: 14-02-2019
www.medicalsciencejournal.com
Volume 5; Issue 3; March 2019; Page No. 45-50

Perinatal outcome in pregnancies with isolated oligohydramnios diagnosed before 37 weeks of gestation

Purushotham MK[1], Ravikanth GO[2], Shakuntala Halli[3], Geeta J Doppa[4]
[1-4] Department of Obstetrics and Gynaecology, KVG Medical College and Hospital, Sullia, Dakshina Kannada, Karnataka, India

Abstract
Background: Adverse pregnancy outcome in cases of oligohydramnios are the result of other pregnancy related complications that are associated with oligohydramnios rather than the result of oligohydramnios itself. Isolated oligohydramnios is comparable to that of low risk pregnancies with normal levels of amniotic fluid. There is only a small number of studies that address the management of isolated oligohydramnios at preterm.
Objective: To study pregnancy outcome in cases of isolated oligohydramnios before 37 weeks of gestation and to study the perinatal outcome in isolated oligohydramnios diagnosed before 37 weeks of gestation.
Methods: A retrospective study of singleton pregnancies diagnosed with isolated oligohydramnios before 37 weeks of gestation. Pregnancy outcome was compared with a matched control group of low-risk preterm pregnancies with normal levels of amniotic fluid.
Results: Pregnancies complicated by isolated oligohydramnios were characterized by a higher rate of preterm deliveries most of which were iatrogenic, and a higher rate of labor induction and cesarean delivery. Neonates with isolated oligohydramnios were characterized by a lower birth weight and a higher rate of neonatal morbidity. These differences were eliminated when the analysis was limited to the subgroup of pregnancies with isolated oligohydramnios that were managed expectantly and delivered.
Conclusion: Adverse pregnancy outcome in cases of isolated oligohydramnios diagnosed before 37 weeks appears to be related to a considerable degree to iatrogenic prematurity.

Keywords: amniotic fluid index, isolated oligohydramnios, perinatal mortality

Introduction

Liquor amnii, a fluid elaborated by amnion a two layered extra embryonic membrane formed by inner ectoderm and outer somatic mesoderm provides fluid medium for the early development of the embryo protecting it from concussion, pressure, dessiccation, reminiscent of the aquatic origin of life.

Adequate amount of amniotic fluid is essential for the normal growth of the fetus for it cushions against all sorts of trauma and agitations. Its bacteriostatic properties prevents infection and it functions as a primary source of fetal nutrients. It creates a physical space for the fetal skeleton to shape normally, promotes fetal lung development, and helps to avert compression of umbilical cord. Amniotic fluid is mainly formed from fetal plasma volume, fetal urine, fetal respiratory system, gastrointestinal tract, umbilical cord and fetal surface of placenta.

In normal pregancies the volume of amniotic fluid increases to about one litre at 36weeks maximum level.Amniotic fluid volume rises progressively during gestation until 36 weeks, the mean amniotic fluid volume relatively consistent in the level of 700-800ml. After 40weeks there is a progressive decline of amniotic fluid volume at a rate of 8 % per week, with amniotic fluid volume averaging about 400ml at 42wks.The clinical picture of reduced amniotic volume is termed oligohydramnios.

A decreased amniotic fluid volume is frequently one of the first clues to an underlying fetus abnormality or maternal disease state. Isolated oligohydramnios may occur in late pregnancy in patients with no other high risk factor associated with oligohydramnios and may be incidentally diagnosed on a routine ultrasound. oligohydramnios is often accompanied by other maternal and fetal conditions such as congenital anomalies, hypertension, diabetes, preterm premature rupture of the fetal membranes (PROM) and intrauterine growth restriction (IUGR). Each condition can predispose fetuses to adverse outcomes. Thus, it is not entirely clear whether the adverse perinatal outcomes merely reflect the sequelae of other conditions or if reduced amniotic fluid volume itself contributes to the adverse outcomes.

Isolated oligohydramnios is diagnosed when no other unfavourable maternal and fetal condition coexists [2]. Oligohydramnios is termed when amniotic fluid is diminished less than 3rd or 5th percentile for gestational age [3]. Oligohydramnios complicates between 0.5%- 5 % of all pregnancies. The prevalence depends largely upon the definition and criteria used for oligohydramnios and the population studied [4].

The possible explanation of the increased perinatal morbidity and mortality could be due to umbilical cord compression, potential utero-placental insufficiency and the increased incidence of meconium stained amniotic fluid and oligohydramnios [5, 6]. Therefore delivery is routinely advocated even an otherwise uncomplicated pregnancies with appropriately grown fetus [7]. However, some of the

recent studies have shown no effect of isolated oligohydramnios on perinatal outcome [8].

Using amniotic fluid index of less than 5cm the incidence of oligohydramnios was found to be 2.3% after 34 weeks. Oligohydramnios was associated with increased risk of adverse perinatal outcome. The umbilical cord compression during labour is common with oligohydramnios which increases the risk for caesarean delivery for fetal distress and 5 minute apgar score less than [7].

The decrease of amniotic fluid volume is associated with the increased labour induction, still birth, non reassuring fetal heart pattern, meconium aspiration syndrome and neonatal death [9].

This present study is undertaken to asses the perinatal outcome in amniotic fluid index of 5 cm or less (oligohydramnios) in Pregnancies diagnosed before 37 weeks of gestation.

Objectives

- To study the perinatal outcome in isolated oligohydramnios diagnosed before 37 weeks of gestation.
- To compare the perinatal outcome in isolated oligohydramnios diagnosed before 37 weeks of gestation with the control group.

Material and Methods

A retrospective study conducted in department of obstetrics and gynecology at KVG Medical College & Hospital, Sullia.100 patients (50 case group and 50 contorl group) with pregnancy less than 37weeks without any medical and obstetrics complication were enrolled in the study according to their AFI. History and examination details were noted, SFH, Uterine size, presentation & adequacy of amniotic fluid clinically, FHR were noted. Perspeculum & Pervaginal examination findings noted to rule out rupture of the membranes. All necessary ANC investigations, Non stress test and ultrasound examinations were noted to see the fetal wellbeing and amniotic fluid index.If delivery by caesarean section or induction then indication was recorded. The patients were followed till 7days after delivery.The condition of babies were assessed by birth weight, APGAR score and the need for neonatal admission.

Inclusion criteria

1. Pateints who were sure of their LMP
2. Gestational age between 34- 37 weeks
3. Intact membrane
4. Singleton pregnancy
5. AFI < 5cm

Exclusion criteria

1. Gestational Age <34 Weeks and >37 weeks
2. PROM.
3. Uterine Anomaly.
4. Malpresentation
5. Multiple gestation
6. Hypertensive disorders of pregnancy
7. Diabetes
8. Chronic renal disease / cardiac disease and othermedical ailment
9. Connective Tissue disorder
10. Vaginal Bleeding (Abruption)
11. Myomectomy/ hysterotomy.

The management protocol was similar in both case group and control group.

a. On admission NST noted for all women in both case and control groups.
b. If NST found reactive, then further management according to protocol and if non-reactive Emergency LSCS.
c. If patient is in labour (ie less than 3 cm in primigravida and less than 4 cm in multigravida are included in study), oxytocin drip started noted.
d. All cases will be monitored by continuous electronic fetal monitoring in labour. Any signs of fetal distress emergency LSCS done noted.
e. After 3 centimeter dilatation of the cervical os in primigravida and 4 cms dilatation in multigravida ARM done or not noted and will be classified as clear and meconium stained liquor.
f. All new borns will be attended by Paediatrician.

Various outcome measures recorded are induced vs spontaneous labour, nature of amniotic fluid, FHR tracings, mode of delivery, indication for caesarean section or instrumental delivery, APGAR score at 1 minutes and 5 minutes, birth weight, admission to neonatal ward, perinatal morbidity and mortality

Statistical Technique used

Data was transcribed from the proforma to Microsoft excel and then transferred to statistical package SPSS Version 20.0.0 for analysis. Comparison of means between the groups was done using Unpaired 't' test. Non-parametric data was analysed using Pearson's chisquare / Mann Whitney U test. P value of <0.05 was taken as statistically significant. The final data was presented in the form of tables and graphs.

Results

The present study is under taken to study the outcome of term pregnancy with amniotic fluid index 5 cm or less (study group) and control group amniotic fluid index > 5 cm,that majority of cases are in the age group of 20 to 30 yrs,86% in study group & 80% in control group were in the age group 20 - 30yrs.

In AFI ≤ 5, 52 % were primi and 48 % were multi, In control group AFI > 5, 56 %were primi and 44 % were multi. But the difference was found to be non significant

In AFI ≤ 5, 68 % had LSCS and 32 % had vaginal delivery,

In AFI > 5, 28 % had LSCS and 72 % had vaginal delivery.

In AFI ≤ 5 CM patients those underwent LSCS: 50 % underwent for fetal distress, 26 % for IUGR,15 % for failed induction,9 % for CPD

In AFI > 5 CM patients those underwent LSCS: 22 % underwent for fetal distress, 2 % for IUGR, 22 % for failed induction, 35 % for CPD.

Induction of labour is 42 % vs 32 % in AFI ≤ 5 and control group, Among induced patients, vaginal delivery was 32 %

vs 81 % in AFI ≤ 5 and control group 20 % of pts in AFI ≤ 5 had thick meconium and only 6 % of patients in control group had thick meconium. In AFI ≤ 5 CM patients 88 % had reactive NST and 12 % had non-reactive NST. In control group about 92 % of patients had reactive NST and 8 % had non-reactive NST.

About 14 % of babies in AFI ≤ 5 are below 2 kg; only 6 % of babies in control group are below 2 kg. In patients with AFI ≤ 5 CM, 14 % had apgar score less than 7 at 5 minutes and in control group 2 % had apgar score less than 7 at 5 minutes.

In AFI ≤ 5 CM patients, 14 % of babies had NICU admission all of them got discharged and they were stable at the time of discharge.18 % babies had IUGR, In control group 4 % of babies had NICU admission and all of them got discharged,8 % of babies had IUGR.

Table 1: Parameters comparing study and control group

	AFI less than or equal to 5		**AFI >5 Control group**	
AGE	n	%	n	%
< 20 YRS	3	6	1	2
20-30 YRS	43	86	40	80
>30 YRS	4	8	9	18
Total	50	100	50	100
Parity	AFI≤ 5 CM		Control Group AFI > 5	
Primi	26	52	28	56
Multi	24	48	22	44
Total	50	100	50	100
Mode of delivery	AFI≤ 5 CM		Control Group AFI > 5	
	n	%	n	%
Vaginal	16	32	36	72
LSCS	34	68	14	28
Indication For Lscs	AFI ≤ 5 CM		Control Group AFI > 5	
Fetal Distress	17	50	5	35
IUGR	9	26	1	8
Failed Induction	5	15	3	22
	AFI ≤ 5 CM		Control Group AFI>5	
	n	%	n	%
Total no of induction	21	42	16	32
Vaginal	16	32	13	81
LSCS	5	10	3	18
Birth Weight	AFI ≤ 5 CM		AFI > 5control Group	
>3 KG	4	8	15	30
2.5- 3 KG	22	44	24	48
2- 2.4 KG	17	34	8	16
Apgar Score	AFI ≤ 5 CM		AFI > 5control Group	
≤4	3	6	0	
<7	4	8	2	
>7	43	86	48	
NST	AFI 5≤ CM		Control Group AFI >5	
Reactive	44	88	46	92
NON Reactive	6	12	4	8
neonatal outcome	afi 5 ≤cm		control group afi >5	
Nicu Admission	7	14	2	4
Discharged	7	100	2	100
IUGR	9	18	1	8

Table 2: Perinatal outcome in afi <5 cm, afi >5 cm (concised)

	Reactive NST		**Non-Reactive NST**		**Reactive NST**	**Non-Reactive NST**
	n	%	n	%	n	n
Mode Of Delivery Vaginal	16	36	0	0	36	-
LSCS	28	63	6	100	10	4
Apgar AT 5 MIN						
< 7	1	5	6	21	1	1
>7	20	95	23	79	45	3
NICU Admission	2	28	5	72	1	1
Neonatal Death	0	0	0	0	0	0

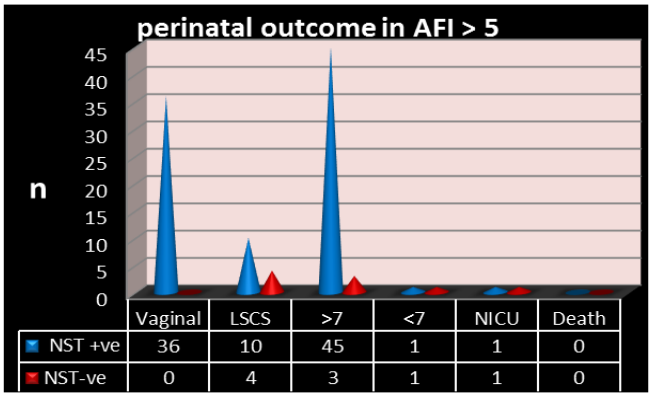

Fig 1

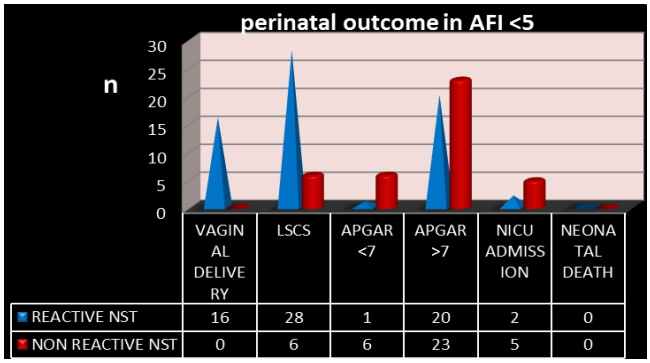

Fig 2

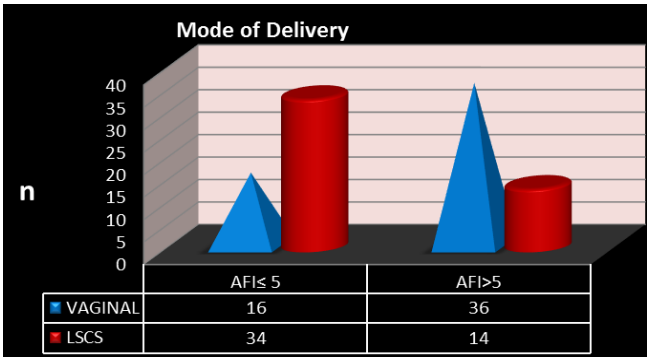

Fig 3

Discussion

Oligohydramnios AFI less than or equal to 5cm is associated with increased perinatal morbidity and mortality. With Oligohydramnios meconium stained liquor, F *et al.* heart rate abnormalities and low apgar scores are more frequent. Neonatal & Fetal acidosis rates were doubled compared with controls (Moore *et al.* 1997) fetal distress requiring operative intervention was tripled compared with control.

In a study conducted by Casey & Coworkers B.M.2001 pregnancy outcomes after antepartum diagnosis of oligohydramnios at or beyond 34weeks gestation in 147 cases. This complication was associated with increase in labour induction (42% vs 18%).

Non reassuring heart rate (48% vs 39%).NICU admission (7 % vs 2%), MSAF (1 % vs 0.1%), neonatal death rate (5 % vs 0.3%).

In a study by Golan & cowokers (1994) fetal outcome in 145 cases, they found increase incidence of fetal distress, MSAF (29.1%) IUGR (24.5%) Breech 17%. Asphyxia during labour 11.5%, corrected PNMR –10%.

In a study by Chamberlain & coworkers 1993,the incidence of major congenital anomaly & IUGR significant related to qualitative AF.

In a study by Youseef *et al.* 1993 in South Med Journal Measurement of AFI and Fetal outcome was studied in pregnancies < 37weeks with AFI less than 5 cm and found AFI is superior in detecting fetal outcome.

In study by Locatelli A 2004 as perinatal outcome associated with oligohydramnios in uncomplicated pregnancies <37weeks 40-41.6weeks. oligohydramnios independently associated with a higher risk of low birth weight percentile.

In study by Baron C & Coworkers 2000 on impact of AFV on Intrapartum on perinatal outcome. AFI less than or equal to 5 cm compared with normal. The efficacy of oligohydramnios predicting caesarean delivery for fetal distress gave a sensitivity of 78% a specificity of 74%,+ve predictive value 33% and -ve predictive value 95%.The AFI for detecting intrapartum oligohydramnios is a valuable screening test for subsequent fetal distress requiring caesarean delivery.

In a study by Chauhan. SP & coworkers 1999 an antepartum & intrapartum amniotic fluid index of ≤5 cm is associated with a significantly increased risk of CS delivery for fetal distress and low apgar scores at 5mins**.**

Present study

In this study perinatal outcome in 50 cases AFI ≤ 5 cm and 50cases of control group are studied.

In AFI ≤5 cm, 16 patients had vaginal delivery & 34 patients had LSCS. In control group about 36 patients had vaginal delivery,14 patients had LSCS.

Present Study induction of labour AFI <5 cm 42 %Control Group32 % in Casey Co Workers(2000)and 42 % and 18 %,Induction of labour is comparable with the study by Casey &coworkers in AmJOG 2000 In present study 21 cases in AFI ≤ 5 cm & 16 cases in control group were induced.

AFI ≤ 5 cm normal labour -16, Emg LSCS -5, Control group normal labour -13, Emg LSCS -3. Caesarean section for fetal distress in Youseef *et al.* (1993)86.6 %, Baron Morgan *et al.* (2000)78 %Present study50 %The efficacy of oligohydramnios predicting CS for Fetal distresshas sensitivity of 78% comparable with various studies.

Meconium stained liquor in Youseef *et al.* (1993)63.6 %, Present Study 33%, The sensitivity of meconium stained liquor is 64% comparable with study.

Apgar score less than 7 @5min in You Seef *et al.* (1993) 88.8 %, Present Study 14 % The sensitivity of oligohydraminos in predicting apgar less than 7 @ 5 min is comparable. IUGR in Youseef *et al.* (1993) 79.9 %, Present Study 18 %, The sensitivity of AFI measurement of ≤ 5 cm is comparable with study.

Merits of the study

1. There is only a small number of studies that address the management of isolated oligohydramnios diagnosed before 37weeks of gestation which was addressed.

2. Detailed about the association of isolated oligohydramnios diagnosed before 37weeks of gestation with perinatal mortality.

The limitation of study include the following

1. Only 50 cases were available during the study period which exactly satisfied inclusion and exclusion criteria.
2. The diagnosis of fetal distress was made depending on FHR tracings. However the fetal acidosis was not proved by fetal scalp blood sampling or other methods because of non –availability.
3. The use of backup surveillance methods like scalp blood sampling and acoustic stimulation and amnioinfusion would have altered the outcome.
4. Neonatal follow up after 7 days was lacking.

Conclusion

This study concludes that isolated decreased AFI less than 37 weeks of gestation is associated with good perinatal outcome, though increased fetal surveillance is needed to know the wellbeing of the fetus.

Significant association was found between isolated decreased AFI and increased rate of IOL, Caesarian section rate,abnormal fetal heart rate tracing and low birth weight babies.There was no significant relation between decreased AFI and following variables like occurrence of meconium stained liquor, APGAR less than 7/10 at one minute and at five minute and neonatal outcome.

References

1. Williams Obstetrics 24rd edition, chapter 21, page 490
2. Zangj, Troendle J, Meikle S, Klebanoff MA, Rayburn WF. Isolated oligohydramnios is not associated with adverse perinatal outcomes. Br J Obstet Gynaecol. 2004; 111(3):220-25.
3. Ian Donald's practical obstetric problems, chapter 18, page 369
4. Hill LM, Breckle R, Wolfgram KR, O'Brien PC. Oligohydramnios; ultrasonically detected incidence and subsequent fetal outcome. Am J Obstet Gynecol. 1983; 147:407-10.
5. Magann EF, Kinsella MJ, Chauhan SP, McNamara MF, Gehring BW, Morrison JC. Does an amniotic fluid index of < 180: Gynecol Obstet J Am study. case-control A pregnancies? High-risk in delivery necessitate cm>, 1999.
6. Sherer DM. A review of amniotic fluid dynamics and the enigma of isolated oligohydramnios. Am J Perinatol. 2002; 19:253-66.
7. Locatelli A, Vergani P, Toso L, Verderio M, Pezzullo JC, Ghidini A. Perinatal outcome associated with oligohydramnios in uncomplicated term pregnancies. Arch Gynecol Obstet. 2004; 269:130-3.
8. Hassan AA. The role of amniotic fluid index in the management of postdate pregnancy. J Coll Physician Surg Pak. 2005; 15: 85-8.
9. Casey BM, Leveno KJ. Pregnancy outcomes after antepartum diagnosis of olgohydramnios at or beyond 34 weeks gestation. American journal of obstetrics and gynecology 182: 909,. en.wikipedia. org/wiki/ Amniotic fluid.
10. Clinical Obstetrics and Gynaecolog. 1997; 40(2):314, 315, 316.
11. Clinical Obstetrics and Gynaecology. 1997; 40(2):280-281.
12. www.glowm. com/./figures/v3/0760/001f.gif
13. Williams manual of Obstetrics Pregnancy complications, 22nd edition; Appendices, page 512
14. Ian Donald's practical obstetric problems, chapter, 365.
15. Phelan JP, Ahn MO, Smith LCDR, Carl V. Amniotic fluid index measurements during pregnancy. J Reprod Med. 1987; 32:601-04.
16. Clinical Obstetrics and Gynaecology. 1997; 40(2):319.
17. Magann EF. Antenatal testing among 1001 patients at high risk: the role of ultrasonographic estimate of amniotic fluid volume. Am J Obstet Gynecol. 1999; 182(6):1581-1588.
18. Manning FA, Hill LM, Platt LD. Qualitative Amniotic fluid volume determination by ultrasound :antepartum detection of intrauterine growth retardation. Am J Obstet Gynecol. 1981; 139:254-58.
19. Phelan JP, Ahn MO, Smith CV, Small M.Amniotic fluid volume assessment with four quadrant technique at 36 to 42 weeks' gestation. J Reprod Med 1987;32:540-42
20. Jeng CJ, Lee JF, Wang KG, Yang YC, Lan CC. Decreased amniotic fluid in term pregnancy.Clinical significance Reprod Med 1992;37(9):789-92
21. Manning FA, Harman CR, MorrisonI, Menticoglou SM, Lange IR. Fetal assessment based on fetal biophysical scoring. IV. An analysis of perinatal morbidity and mortality. Am J Obstet Gynecol. 1990; 162(3):703-709.
22. Shenker L, Reed KL, Anderson CF, *et al.* Significance of oligohydramnios complicating pregnancy.Am J Obstet Gynaecol, 1991; 164:1597,
23. Mercer L J,Brown LG: Fetal outcome with oligohydramnios in the second trimester. Obstet Gynaecol 67:840,1986
24. Casey BM. Pregnancy outcomes after antepartum diagnosis of oligohydramnios at or beyond 34 weeks' gestation. Am J Obstet Gynecol. 2000; 182: 909-12.
25. Chauhan SP, Sanderson M, Hendrix NW *et al.* Perinatal outcome and amniotic fluid index in the antepartum and intrapartum period: A meta-analysis. Am J Obstet Gynecol. 1999; 181:1473-78.
26. Conway DL, Groth S, Adkins WB, *et al.* Management of Isolated decreased AFI in term pregnancy: A randomized clinical trial. Am J Obstet Gynaecol. 2000; 182:S:21.
27. Practical Guide to High-Risk Pregnancy,Fernando Arias,3rdedition,chapter 3,page 94.
28. Rutherford SE, Phelan JP, Smith CV, *et al.* The four-quadrant assessment of amniotic fluid volume: an adjunct to ante partum fetal heart rate testing. Obstet Gynaecol. 1987; 70:353-356.
29. Hoskins IA, Frieden FJ, Young BK. Variable decelerations in reactive non stress tests with decreased amniotic fluid index predict fetal compromise. Am J Obstet Gynaecol. 1991; 165:1094-1098.
30. Clark SL, Sabeyp, Jolley K. Nonstress testing with acoustic stimulation and amniotic fluid volume assessment: 5973 tests without unexpected fetal death. Am J Obstet Gynaecol. 1989; 160:694-697.
31. Youssef AA, Abdulla SA, Sayed EH, *et al.* Superiority of amniotic fluid index over amniotic fluid pocket

measurement for predicting bad fetal outcome.South Med J. 1993; 86:426-429.
32. Marks AD, Divon MY. Longitudinal study of the amniotic fluid index in post datespregnancy. Obstet Gynaecol. 1992; 79:229-233.
33. Lagrew DC, Pircon RA, Nageotte M, *et al.* How frequently should the amniotic fluid index be repeated ? Am J Obstet Gynacol. 1992; 167:1129-1133.
34. Locatelli Anna, *et al.* Archives of Gynecology and Obstetrics. 2004; 269:2.
35. Magann EF, Chauhan SP, Martin JN. Is amniotic fluid volume status predictive of fetal acidosis at delivery? N Z J Obstet Gynaecol. 2003b; 43:129.
36. Petrozella, Loren N, Dashe, Jodi S, *et al.* MD Obstetrics & Gynecology. 2011; 117(2):338-342.
37. Zhang J, Troendle J, Meikle S, Klebanoff MA, Rayburn WF. Isolated oligohydramnios is not associated with adverse perinatal outcomes. BJOG. 2004; 111:220-5.
38. Locatelli A, Vergani P, Toso L, Verderio M, Pezzullo JC, Ghidini A. Perinatal outcome associated with oligohydramnios in uncomplicated term pregnancies. Arch Gynecol Obstet. 2004; 269:130-3.
39. Youssef AA, Abdulla SD, Sayed EH, *et al.* Superiority of amniotic fluid index over amniotic fluid pocket measurement for predicting bad fetal outcome. Southern Medical Journal. 1993; 86:426-29.
40. Voxman EG, Tran S, Wing DA. Low amniotic fluid index as a predictor of adverse perinatal outcome. Journal of Perinatology. 2002; 22:282-85.
41. Desai P, Patel P, Gupta A. Decreased amniotic fluid index in low-risk pregnancy: Any significance? J Obstet GynecolInd. 2004; 54:464-66.
42. Chauhan SP, Sanderson M, Hendrix NW, *et al.* Perinatal outcome and amniotic fluid index in the antepartum and intrapartumperiods: A meta-analysis. Am J Obstet Gynecol. 1999; 181:1473-78.
43. Locatelli A, Zaqarella L, Toso L, Assi F, Ghidini A, Biffi A. Serial assessment of AFI in uncomplicated term pregnancies: Prognostic value of amniotic fliud reduction. J Matern Foetal Neonatal Med. 2004; 15:233-6.
44. Conway DL, Adkins WB, Schroeder B, Langer O. Isolated oligohydramnios in the term pregnancy. Is it a clinical entity? J Mat Foetal Med. 1998; 7:197-200.
45. Golan A, Lin G, Evron S, *et al.* Oligohydramnios: Maternal complications and fetal outcome in 145 cases. Gynecol Obstet Invest. 1994; 37:91-95.