ORIGINAL RESEARCH

A comparative assessment of pregnancy outcome following amniocentesis at 14 weeks of gestation with the pregnancy outcome following later amniocentesis and CVS

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ABSTRACT

Background: The methods for accurately and promptly diagnosing fetal abnormalities have advanced significantly during the past 20 years. The present study compared the pregnancy outcome following amniocentesis at 14 weeks of gestation with the pregnancy outcome following later amniocentesis and CVS. **Materials &Methods:** 48 women who underwent invasive prenatal diagnostic procedureswere classified into 3 groups of 18 each. Group I underwent amniocentesis at 14 weeks of gestation, group II amniocentesis at ≥15 weeks of gestation and group III underwent chorionic villous sampling. The pregnancy outcomes and the complications were compared. **Results:** Parity 0 was seen in 7, 6 and 4in group I, II and III respectively. Parity +1 in 11, 12 and 14 respectively. Previous miscarriage was 0 in 10, 7 and 8, 1 in 4, 5 and 5 and +1in 4, 6 and 5 patients. Placental site was anterior in 7, 7 and 9, posterior in 8, 7 and 6 and other fundal in 3, 4 and 3. Indication was NT risk > 1:300 in 3, 1 and 2, maternal anxiety in 7, 9 and 6, maternal age in 4, 6 and 7 and previous history in 4, 2 and 3patients respectively. The difference was non- significant (P>0.05). Outcomes in group I, group II and group III was failed culture in 1, 0 and 1, failed procedure in 1, 1 and 2, amniotic fluid leakage in 2, 1 and 1, blood stained liquor in 0, 1 and 2, PPROM in 1, 2 and 0, bleeding in 1, 1 and 0, respiratory complication in 1, 1 and 2, preterm delivery in 2, 1, 2 and blood stained liquor in 2, 2, 1 respectively. The difference was non- significant (P>0.05). **Conclusion:** Women could be administered amniocentesis at 14 weeks of gestation as an alternative to later amniocentesis or CVS without posing a noticeably higher risk to the mother and unborn child.

Keywords: amniocentesis, fetal abnormalities, prenatal

INTRODUCTION

The methods for accurately and promptly diagnosing fetal abnormalities have advanced significantly during the past 20 years.[1]Non-invasive prenatal diagnosis is now feasible thanks to the discovery of free fetal nucleic acids in the mother's bloodstream. However, non-invasive prenatal diagnostic procedures are still in the experimental stage, and the only way to make an accurate prenatal diagnosis is to analyze fetal blood or fetal cells from the placenta and amniotic fluid (chorionic villi).[2] Therefore, amniocentesis, chorionic villous sample (CVS), and fetal blood collection are the main methods for obtaining fetal cells for prenatal diagnosis.[3]

Amniocentesis is the most widely done invasive test for the prenatal diagnosis of genetic disorders, and it is generally conducted between 15 and 18 weeks of gestation. The fact that a conclusive result is typically only obtained after 18 weeks of gestation is a significant drawback of second trimester amniocentesis.[4] For couples, this can be extremely upsetting, especially as it may result in a late pregnancy termination with the higher dangers that go along with it. Early amniocentesis and CVS are the other earlier alternatives.

Chorionic villus sampling was established during the 1980s and it is currently the preferred invasive procedure in the first trimester of pregnancy.[5] It can

begin as early as week 10 of pregnancy and entails aspirating placental tissue under ultrasound guidance using eitherthe percutaneous trans-abdominal route, or the transvaginal/ trans-cervical approach.[6]The present study compared the pregnancy outcome following amniocentesis at 14 weeks of gestation with the pregnancy outcome following later amniocentesis and CVS.

MATERIALS & METHODS

The study was carried outon 48 women who underwent invasive prenatal diagnostic procedures.All gave their written consent to participate in the study. Data such as name, age, etc. was recorded. Women were classified into 3 groups of 18 each. Group I underwent amniocentesis at 14 weeks of gestation, group II amniocentesis at ≥15 weeks of gestation and group III underwent chorionic villous sampling. The pregnancy outcomes and the complications were compared. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Characteristics of patients

Parameters	Variables	Group I	Group II	Group III	P value
Parity	0	7	6	4	0.18
	+1	11	12	14	
Previous miscarriage	0	10	7	8	0.92
	1	4	5	5	
	+1	4	6	5	
Placental site	Anterior	7	7	9	0.57
	Posterior	8	7	6	
	Other fundal	3	4	3	
Indication	NT risk > 1:300	3	1	2	0.73
	Maternal anxiety	7	9	6	
	Maternal age	4	6	7	
	Previous history	4	2	3	

Table I shows that Parity0 was seen in 7, 6 and 4in group I, II and III respectively. Parity +1 in 11, 12 and 14 respectively. Previous miscarriage was 0 in 10, 7 and 8, 1 in 4, 5 and 5 and +1in 4, 6 and 5 patients. Placental site was anterior in 7, 7 and 9, posterior in 8, 7 and 6 and other fundal in 3, 4 and 3. Indication was NT risk > 1:300 in 3, 1 and 2, maternal anxiety in 7, 9 and 6, maternal age in 4, 6 and 7 and previous history in 4, 2 and 3 patients respectively.The difference was non- significant (P>0.05).

Table II Pregnancy outcomes

Outcomes	Group I	Group II	Group III	P value
Failed culture	1	0	1	0.96
Failed procedure	1	1	2	
Amniotic fluid leakage	2	1	1	
Blood stained liquor	0	1	2	
PPROM	1	2	0	
Bleeding	1	1	0	
Respiratory complication	1	1	2	
Preterm delivery	2	1	2	
Blood stained liquor	2	2	1	

Table II, graph I shows that outcomes in group I, group II and group III was failed culture in 1, 0 and 1, failed procedure in 1, 1 and 2, amniotic fluid leakage in 2, 1 and 1, blood stained liquor in 0, 1 and 2, PPROM in 1, 2 and 0, bleeding in 1, 1 and 0, respiratory complication in 1, 1 and 2, preterm delivery in 2, 1, 2 and blood stained liquor in 2, 2, 1 respectively. The difference was non-significant (P>0.05).

DISCUSSION

Early amniocentesis (9 to 14 weeks of gestation), which was introduced in the late 1980s, is technically the same as the latter procedure. The major concern with early amniocentesis is the increased risk of miscarriage, as well as orthopaedic foot deformities and respiratory disturbances at birth.[7] However, most of these studies considered procedures which were performed before 14 weeks of gestation.[8,9]The present study compared the pregnancy outcome following amniocentesis at 14 weeks of gestation with the pregnancy outcome following later amniocentesis and CVS.

We found that Parity 0 was seen in 7, 6 and 4in group I, II and III respectively. Parity +1 in 11, 12 and 14 respectively. Previous miscarriage was 0 in 10, 7 and 8, 1 in 4, 5 and 5 and +1in 4, 6 and 5 patients. Placental site was anterior in 7, 7 and 9, posterior in 8, 7 and 6 and other fundal in 3, 4 and 3. Indication was NT risk > 1:300 in 3, 1 and 2, maternal anxiety in 7, 9

and 6, maternal age in 4, 6 and 7 and previous history in 4, 2 and 3 patients respectively. Narang et al[10]compared the safety and efficacy of amniocentesis at 14 weeks of gestation with amniocentesis at ≥15 weeks and chorionic villous sampling. This was a retrospective study of the pregnancy outcome of 299 women who underwent invasive prenatal diagnosis by using amniocentesis at 14 weeks of gestation, amniocentesis at ≥15 weeks of gestation and chorionic villous sampling. There was no significant difference between the women who underwent amniocentesis at 14 weeks of gestation and those who underwent amniocentesis at ≥ 15 weeks of gestation or chorionic villous sampling in terms of failed cultures, miscarriage, preterm pre-labour, rupture of membranes, preterm delivery and neonatal respiratory complications ($p > 0.05$).

We found that outcomes in group I, group II and group III was failed culture in 1, 0 and 1, failed procedure in 1, 1 and 2, amniotic fluid leakage in 2, 1 and 1, blood stained liquor in 0, 1 and 2, PPROM in 1, 2 and 0, bleeding in 1, 1 and 0, respiratory complication in 1, 1 and 2, preterm delivery in 2, 1, 2 and blood stained liquor in 2, 2, 1 respectively. Blackstone and colleagues[11] conducted a study to determine the rates of the complications which were associated with amniocentesis, based on the gestational age and found that the 12.0−12.9−week group had a complication rate of 1.20% (3/256), the 13.0−13.9−week group had the highest complication rate of 2.68% (8/298, $P < 0.01$), the 14.0−14.9−week group had the lowest complicate rate of 0.5% (1/183, $P < 0.01$), and that the 15.0−15.9−week group had a complication rate of 1.20% (2/166). The finding of the lowest incidence of the pregnancycomplications in the 14.0−14.9−week group.

Centini G et al[12] reported singleton pregnancies the post-procedure safety and maternal complications of early amniocenteses performed between 13 + 0 and 14 + 6 weeks of gestation and mid-trimester amniocenteses performed between 15 + 0 and 18 + 6 weeks of gestation.Cytogenetic anomalies were found in 111 cases (2.9%), 18 occurring early and the other 93 in mid-trimester. Miscarriage occurred in two cases in the early amniocentesis group (0.4%) and in ten cases among the mid-trimester group (0.3%). The overall loss of pregnancies due to amniocentesis in this study was 0.3%. Amniotic fluid was stained in 1.2% in the early group and 0.9% in the mid-trimester group. Amniotic fluid leakage was noted in 1.4% and 1.2%, preterm PROM was noted in 3.3%) and 3%, and preterm delivery occurred in 8% and 7.6%, respectively. There were no cases of failed amniotic culture and no cases of talipes equinovarous documented.The risks of early amniocentesis performed between 13 + 0 and 14 + 6 weeks appear to be comparable to those of mid-trimester amniocentesis and thus early amniocentesis could be offered to the parents, as an alternative to chorionic villus sampling, in order to obtain cytogenetic results earlier in pregnancy without a significantly increased risk for both mother and fetus.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that women could be administered amniocentesis at 14 weeks of gestation as an alternative to later amniocentesis or CVS without posing a noticeably higher risk to the mother and unborn child.

REFERENCES

1. Cederholm M, Haglund B, Axelsson O. Infant morbidity following amniocentesis and chorionic villus sampling for prenatal karyotyping. BJOG: An International Journal of Obstetrics and Gynaecology. 2005;112:394-402.
2. Tredwell SJ, Wilson D, Wilmink MA. Review of the effect of early amniocentesis on foot deformity in the neonate. Journal of PediatricOrthopedics. 2001;21:636-41.
3. Roper EC, Konje JC, De−Chazal RC, Duckett DP, Oppenheimer CA, Taylor DJ Genetic amniocentesis: Gestation−specific pregnancy outcome and the comparison of the outcome following early and traditional amniocentesis. Prenatal diagnosis 1999;19:803−807.
4. Blackstone J, Pinette MG, Pan Y, Pinette SG, Michaud J. Is there an optimal time for early amniocentesis? Journal of Maternal−Fetal Investigation 1997;7:72−75.
5. Schaap AH, van der Pol HG, Boer K. Leschot NJ, Wolf H. Long-term follow-up of infants after transcervical chorionic villus sampling and after amniocentesis to compare the congenital abnormalities and the health status. Prenatal Diagnosis. 2002;22:598-604.
6. A Alfirevic Z, Sundberg K, Brigham S. Amniocentesis and chorionic villus sampling for prenatal diagnosis. Cochrane Database of Systematic Reviews. 2003;(3):CD003252.
7. Amniocentesis and chorionic villous sampling RCOG (Green-top 8) Guideline. 2005.
8. Silver RK, Wilson RD, Philip J, Thom EA, Zachary JM, Mohide P, et al. Late first-trimester placental disruption and subsequent gestational hypertension/preeclampsia. Obstetrics and Gynecology. 2005;105:587-92.
9. Liley AW. Liquor amnii analysis in the management of the pregnancy complications by rhesus sensitization. AM J ObstetGynaecol 1961; 82: 13-59.
10. Latia Narag, exadra Sayer, Vaihai arg, OmeOguehThe Outcome of Amniocentesis at 14 Weeks of Gestation. Journal of Clinical and Diagnostic Research. 2012 April, Vol-6(2): 289-292.
11. Blackstone J, Pinette MG, Pan Y, Pinette SG, Michaud J. Is there an optimal time for early amniocentesis? Journal of Maternal−Fetal Investigation 1997;7:72−75.
12. Centini G, Rosignoli L, Kenanidis A, Scarinci R, Petraglia F. A report of early (13 + 0 to 14 + 6 weeks) and mid-trimester amniocenteses: 10 years of experience. Journal of Maternal-Fetal and Neonatal Medicine. 2003;14:113-17.