

Fetal Loss Rate after Mid-trimester Amniocentesis

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Purpose: The aim of this study was to assess the fetal loss rate after mid-trimester amniocentesis.

Materials and Methods: This was a retrospective cohort study including singleton pregnant women who underwent mid-trimester amniocentesis at Cheil General Hospital from January 2008 through December 2010. The procedure-related fetal loss was defined as miscarriage within 2 weeks after amniocentesis. We evaluated the fetal loss rate within 2 weeks after amniocentesis and fetal loss rate before 24 gestational weeks.

Results: During the study period, a total of 4,356 singleton pregnant women underwent mid-trimester amniocentesis. A total of Five hundred ninety six women were excluded owing to follow up loss and termination of pregnancy due to abnormal karyotype or major anomaly. At our institute, the fetal loss rate within 2 weeks was 0.1% and before 24 gestational weeks was 0.3% after amniocentesis.

Conclusion: The fetal loss rate after mid-trimester amniocentesis in our study is lower than previously reported rate. We suggest that amniocentesis is a safe procedure.

Key Words: Amniocentesis, Fetal loss rate

Introduction

The risk of fetal aneuploidy increases with maternal age. Recently, as the average age at pregnancy has increased, the need for fetal karyotyping has also increased. During the last 40 years, amniocentesis has been most commonly used as an invasive diagnostic procedure in the second trimester of pregnancy. Counseling about amniocentesis should include information about procedure-related complications.¹⁾ Complications include

transient vaginal spotting or amniotic fluid leakage in about 1-2% of cases and chorioamnionitis in less than 1 in 1,000 cases.²⁾ The amniocentesis-related fetal loss rate has been reduced to 1 in 300-500 compared to a rate of than 1 in 100 in the past.³⁻⁵⁾ This rate may be even lower when the procedure is performed by experienced individuals or centers.^{3,4)}

The aim of this study was to assess the fetal loss rate after mid-trimester amniocentesis at our institution.

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Material and Methods

This was a retrospective cohort study including singleton pregnant women who underwent mid-trimester amniocentesis at Cheil General Hospital from January 2008 through December 2010. The indications for amniocentesis were advanced maternal age (maternal age ≥ 35 years), positive screening for maternal serum markers, abnormal ultrasound findings, previous history or parental chromosomal abnormality, and others.

The procedure was performed after 15+0 weeks of pregnancy. Under ultrasound guidance, a 22 gauge spinal needle was inserted into the amniotic sac avoiding the umbilical cord and fetus. Immediately after amniocentesis, the heart rate and movement of the fetus and placental bleeding were assessed.

Pregnancy outcomes were classified as fetal loss within 2 weeks or 2-4 weeks after amniocentesis, before 24 gestational weeks, intrauterine fetal death more than 24 gestational weeks, and live born. The procedure-related fetal loss was defined as miscarriage within 2 weeks after amniocentesis and these cases were analyzed.

Results

During the study period, a total of 4,356 singleton pregnant women underwent mid-trimester amniocentesis. We excluded 596 women who were lost to follow up or terminated their pregnancy due to abnormal karyotype or major anomaly. Finally a total of 3,760 patients were included in this study.

The indications for amniocentesis were advanced maternal age ($n=2,965$); positive screen for maternal serum markers ($n=854$); abnormal ultrasound findings ($n=650$); previous history or parental chromosomal abnormality ($n=114$); and others ($n=84$). The number of cases according to indications of amniocentesis included multiple choices (Table 1).

Pregnancy outcomes following amniocentesis were analyzed. The fetal loss rate was 0.13% ($n=5$) within 2 weeks, 0.03% ($n=1$) between 2 weeks and 4 weeks after amniocentesis, and 0.27% ($n=$

Table 1. Case numbers according to indications of amniocentesis

Indications	Numbers*
Advanced maternal age	2,965
Screening positive maternal serum markers	854
Abnormal ultrasound findings	650
Previous history or parental chromosomal abnormality	114
Others	84

*Multiple choices are included.

10) before 24 gestational weeks. Intrauterine fetal death more than 24 gestational weeks after procedure was 0.29% ($n=11$), and live born was 99.28% ($n=3,733$) (Table 2).

The procedure-related fetal losses included five cases (Table 3). In these cases, the period taken until fetal loss was 3 days, 6 days, 7 days, and 14 days respectively. Indications were advanced maternal age ($n=3$), increased alpha fetoprotein ($n=1$), positive integrated test for Down syndrome ($n=1$). The final diagnoses in these cases were premature rupture of membranes ($n=3$) and incompetence internal of cervix ($n=2$).

Discussion

The fetal loss rate following amniocentesis has been reported in many studies.⁶⁻¹⁰ A recent systematic review of the procedure-related complications of amniocentesis included 29 observational studies published after 1995.⁶ The rate of pregnancy loss before 24 weeks was 0.9% following amniocentesis, but there were with wide variation between studies.⁶ In a cohort study of more than 60,000 singleton pregnancies undergoing amniocentesis, the post-procedural fetal loss rate before 24 completed weeks' gestation was 1.4%, and the total fetal loss rate was 2.0%.⁷ Furthermore, the fetal loss rate was higher in departments performing fewer than 1,500 procedures over the 11-year study period compared with those performing more than 1,500 procedures.⁷ In another

Table 2. Pregnancy outcomes of pregnant women underwent amniocentesis

Pregnancy outcomes	Numbers (%)
≤ 2 weeks loss after procedure	5 (0.13)
>2 weeks- ≤ 4 weeks loss after procedure	1 (0.03)
≤ 24 gestational weeks loss	10 (0.27)
>24 gestational weeks intrauterine fetal death	11 (0.29)
live born	3,733 (99.28)
Total	3,760 (100)

Table 3. Details of fetal loss within 14 days after amniocentesis

Case No.	GA(wks) at amniocentesis	GA (wks) at Fetal loss	Indications of amniocentesis	Final diagnosis
1	20+3	21+3	AFP \uparrow	IIOC
2	16+2	16+5	IG(+)	PROM
3	17	19	AMA	IIOC
4	18+5	20+5	AMA	PROM
5	16+1	17	AMA	PROM

AFP, Alpha fetoprotein; AMA, Advanced maternal age; GA, Gestational age; IG (+), Integrated test positive for Down SD; IIOC, Incompetence internal of cervix; PROM, Premature rupture of membranes.

domestic study, pregnancy outcomes of 499 amniocentesis cases were analyzed, and the fetal loss rate within 4 weeks after the procedure was 0.8%.⁸⁾

In our study, the fetal loss rate was 0.13% (n=5) within 2 weeks and 0.16% (n=6) within 4 weeks after amniocentesis. Two cases of five cases were diagnosed finally with incompetence internal of cervix. In actuality, only three cases were associated with fetal loss following the procedure. These results are lower than those reported in previously published studies. Our institute has been experienced a large number of amniocentesis for several decades and amniocentesis has been examined systemically by well-trained experts. These may contribute to reduce the fetal loss rate after amniocentesis.

We acknowledge that our study has some limitations. We did not assess the background loss rate for women in whom an invasive procedure may have been indicated. In the future, a study comparing the background loss rate should be conducted.

The strengths of the study were that it was performed at a single center and the number of cases was greater than that included in other single center studies. In conclusion, the fetal loss rate after mid-trimester amniocentesis in our study was lower than previously reported rates.⁶⁻¹⁰⁾ We suggest that amniocentesis is a safe procedure.

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