Perinatal complications of amniocentesis

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Abstract

Objectives. *Amniocentesis is a procedure commonly used to diagnose chromosomal abnormalities, fetal aneuploidy and other genetic disorders. Complications of amniocentesis include pain, vaginal spotting, amniotic fluid leakage, miscarriage and preterm labor. The purpose of this research is to determine the complication and pregnancy loss rates after amniocentesis.* ***Methods.*** *This retrospective study was performed including the patients admitted to the Prenatal diagnosis center at Zeynep Kamil Hospital in 2009. The number of the pregnant women who were admitted for amniocentesis was 705. The number of the pregnant women who underwent amniocentesis for different reasons was 597. Some of the patients (n=108) refused the procedure and served as our control group.* ***Results.*** *Having abnormal maternal serum screening results was the most common indication for amniocentesis (37.2%). The most common complications were abdominal pain (4.4%), vaginal spotting (2%), amniotic fluid leakage (0.8%). Total fetal loss after amniocentesis was 2.2% (n=13). Amniotic fluid leakage prevalence at the cases that had fetal loss was 37.5%. Abdominal pain and vaginal spotting prevalence at the cases that had fetal losses were 75% and 87.5% respectively.* ***Conclusions.*** *Parents considering prenatal diagnosis must be fully informed about the risks and benefits. The patients who experience early complications such as vaginal spotting, abdominal pain, and amniotic fluid leakage have higher risk of fetal losses.*

Keywords: *complications of amniocentesis, fetal loss, chromosomal abnormalities, first trimester screening test*

Introduction

Over 40 years ago, amniocentesis was introduced as a diagnostic invasive procedure in the second trimester of pregnancy[1].

Amniocentesis is a procedure commonly used to diagnose chromosomal abnormalities, fetal aneuploidy and other genetic disorders. Amniocentesis for genetic diagnosis is usually performed between 15 and 20 weeks. Complications include pain, vaginal spotting, amniotic fluid leakage, miscarriage and preterm labor. Miscarriage is the important complication, with incidence 1%[1].

The purpose of this research is to determine the complication and pregnancy loss prevalence's after amniocentesis performed at the Prenatal Diagnosis Center at the Zeynep Kamil Hospital, Istanbul.

Methods

This retrospective study was performed including the patients admitted to the Prenatal Diagnosis Center at Zeynep Kamil Hospital in 2009.

The study was approved by the Institutional Ethics Committee and written informed consent was obtained from all patients.

The number of the pregnant women who were admitted for amniocentesis was 705. The number of the pregnant women who underwent amniocentesis for different reasons was 597. Some of the patients (n=108) refused the procedure and served as our control group. Amniotic fluid was collected in 2 ml tubes by 22 gauge needles under ultrasound guidance (730 pro 4D ultrasound devices). Data was collected by chart review and telephone interviews.

Statistical analysis

Statistical analysis was performed using the NCSS 2007 program. The mean and standard deviation were calculated for continuous variables. Chi-square, independent sample t-tests and Fisher test were used to evaluate associations between the categorical and continuous variables. Two-sided P values were considered to be statistically significant at $P < 0.05$.

Results

The majority of women in both groups were multiparous. There was no significant difference between groups in terms of age, gestational age, or gravidity. The groups are compared in terms of demographic and clinical characteristics in Table 1.

Having abnormal maternal serum screening results was the most common indication for amniocentesis (37.2%) and the most common indications for the control group is advanced maternal age. Indications for amniocentesis are shown in Table 2.

There was no significant difference between study and control groups in terms of chronic diseases which can cause fetal losses. The most common chronic disease is chronic hypertension. Chronic diseases prevalence's at the study and control groups are shown at the Table 3.

Among the amniocentesis cases, fetal loss before 24 weeks was 1.34% (n=8). Total fetal loss after amniocentesis was 2.2% (n=13). Odds ratios of total fetal losses and fetal losses before 24 weeks between study and control group were not statistically significant. Fetal losses of study and control group are compared in Table 4.

The most common complications were abdominal pain (4.4%), vaginal spotting (2%), amniotic fluid leakage (0.8%). These complications were seen in the first week after the procedure. Chorioamnionitis and temperature spikes were not seen.

Amniotic fluid leakage prevalence at the cases which had fetal loss was 37.5%. Amniotic fluid leakage prevalence at the cases who didn't have fetal loses was 0.3% (p = 0.01 statistically significant).

Received: *July 18, 2012*
Revised: *October 15, 2012*
Accepted: *December 11, 2012*

Table 1 Demographic and clinical characteristics of study and control groups

	Study group	Control group	P value
Age	31.15±5.77	32.31±6.09	0.055
Gravida	2.87±1.64	2.47±1.36	0.017
Parity	2.08±10.67	1.83±0.97	0.808
Abortion	1.22±0.99	0.59±0.81	0.0001

Table 2 Indications for amniocentesis

Indications	Study Group		Control Group		P value	
High risk at first trimestr screninng test	170	28.5%	7	6.73%	0.0001	
Abnormal maternal serum tests	222	37.2%	34	32.69%	0.278	
Advanced maternal age	183	30.7%	60	57.69%	0.0001	
Previous pregnancy with chromosomal abnormality	20	3.4%	3	2.88%	0.989	
Parent with chromosomal abnormality	1	0.2%	0	0.0%	0.670	p = 0.0001

Table 3 Chronic diseases which can cause fetal losses

		Study group		Control group		
Asthma	-	594	99.5%	108	100%	χ^2=0.545
	+	3	0.5%	0	0%	p=0.460
Diabetes	-	590	98.8%	107	99.1%	χ^2=0.05
	+	7	1.2%	1	0.9%	p=0.824
Chronic Hypertension	-	575	96.3%	103	95.4%	χ^2=0.222
	+	22	3.7%	5	4.6%	p=0.638
Hypothyrodism	-	589	98.7%	107	99.1%	χ^2=0.124
	+	8	1.3%	1	0.9%	p=0.724

Table 4 Fetal losses of study and control group

	Study Group		Control Group		P value
Fetal loss before 24 weeks	8	1.34%	2	1.86%	χ^2=0.17
Total fetal loss	5	2.2%		2.8%	p=0.700
Giving birth without fetal loss	584	98.4%	105	98.14%	p=0.678

**OR=0.72 (0.14-3.43)*

Table 5 Complication rates at the cases who had fetal losses and didn't have fetal losses

	Fetal loss			No fetal loss		
Pain	+	2	25%	564	96.6%	χ^2=93.2
	-	6	75%	20	3.4%	p=0.0001
Vaginal spotting	+	1	12.5%	579	99.1%	χ^2=256
	-	7	87.5%	5	0.9%	p=0.0001
Fluid leakage	+	5	62.5%	582	99.7%	χ^2=89.5
	-	3	37.5%	2	0.3%	p=0.0001

Abdominal pain and vaginal spotting prevalences at the cases who had fetal losses were 75% and 87.5% respectively (p = 0.01). Complication prevalences at the cases who had fetal losses and didn't have fetal losses are shown at the Table 5.

Between the study and control group, there was no statistically significant difference according to risk factors such as recurrent pregnancy loss, previous miscarriage, previous preterm labor history,drug usage during the pregnancy, threatened abortion history, preterm premature rupture of membranes history, preeclempsia and abruption of placenta history (p >0.05).

Discussion

The purpose of our research is to determine the complication and pregnancy loss rate after the amniocentesis procedure performed at the Prenatal Diagnosis Center at the Zeynep Kamil Hospital in Istanbul.

Although amniocentesis is commonly used safe procedure, there is no enough research about early complications (fluid leakage, pain and vaginal spotting). Most of the researches in the literature are about late complications. Due to challenges at the approval of Ethics Committees, in most of the studies, they compare fetal loss rate and other complications of amniocentesis between the cases underwent amniocentesis with the control group who doesn't have amniocentesis indication and have low risk factors. In our study the patients who had high risk factors and refused the amniocentesis served as our control group. We compare the amniocentesis complications between the patients who underwent amniocentesis with the patients who had amniocentesis indications but refused the procedure. This is one of he strength points of our study. Number of the control group is 108. This is the weakness of our study.

Eddleman and contributors[2] reported that fetal loss rate of the patients who did not accept the amniocentesis procedure is 3.76% and fetal loss rate of the patients who accept the procedure is 1.06%. Unlike Eddleman and contributors[2], in our study there was no significant difference between the patients who had amniocentesis and control group in terms of fetal loss.

Tabor and Alfirevic[1] reported that the procedure-related miscarriage rate was 1% for amniocentesis. Eddleman at al[2] reported that fetal loss rate before the 24 weeks was 1%. In this study total fetal loss rate is 1.34%. Our findings are in agreement with those reported in a review published by Tabor and Alfirevic[1], Eddleman et al[2] and Constantinescu and contributors[3].

In 2007 SOGC[4] committee reported that most common factors that cause fetal loss after the procedure were maternal age, chronic diseases, gestational week, congenital malformations, placenta localization, needle size and maternal BMI. In our study there was no significant difference between groups in terms of chronic diseases, age, gestational age, or gravidity.

Early complications after the amniocentesis are amniotic fluid leakage, vaginal spotting and abdominal pain[5]. There is not enough research about these early complications[6-10]. Kishida and contributors[5] reported that amniotic fluid leakage rate was 2%, vaginal spotting rate was 3% and these complications were not related to fetal loss. In our study amniotic fluid leakage rate was 0.8%, vaginal spotting rate was 2%, and abdominal pain rate was 4.4%. Unlike Kishida et al[5] or Erdemoglu et al[11], Seed[12] and the Canadian early and mild-trimester amniocentesis trial (CEMAT)[13] in our study, these complications were seen more with cases who had fetal losses. Amniotic fluid leakage rate in cases which had fetal loss was 37.5%. Amniotic fluid leakage rate in cases who didn't have fetal loses was 0.3% (p=0.01). Vaginal spotting rate in cases who had fetal loss was 87.5% and vaginal spotting rate in cases who didn't have fetal loses was 0.9% (p=0.01).

Cavalotti and Casilia[7] reported that vaginal spotting rate after amniocentesis is 1.9% and abdominal pain rate is 8.9%. Our findings are in agreement with those reported in an review published by Cavalotti and Casilia[7] but abdominal pain rate was found higher in our study.

Cavalotti and Casilia[7] reported that patients who experienced vaginal spotting had higher fetal loss rates. They reported that vaginal spotting rate was 1.9% which was similar to our rate.

Although according to many researches early complications are not related to poor pregnancy outcomes, unlike Eddleman and contributors[2] and Kishida and contributors[5] we found increase fetal loss rate at the patients who had early complications.

Conclusions

Although amniocentesis is commonly used safe procedure, parents considering prenatal diagnosis must be fully informed about the risks and benefits. Total fetal loss rate after the procedure was 1.34%. When we compare the study and control group in terms of total fetal loss, there is no significant difference. The patients who experience early complications such as vaginal spotting, abdominal pain, and amniotic fluid leakage have higher risk of fetal losses. More research about early complications is needed. ■

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