

Early complications of prenatal invasive diagnostics: perspective analysis

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Abstract. In this retrospective analysis we studied 1489 women who underwent prenatal invasive diagnostic procedures between January 2000 and December 2002. We examine the influence of risk factors and the incidence of early complications following amniocentesis and chorion villus sampling, in particular the incidence of fetal loss. The study group included 438 women who underwent CVS and 1051 underwent amniocentesis. For each woman we studied anamnestic risk factors (recurrent pregnancy losses, fibroids, twin birth, uterine hematic loss), intraoperative risk factors (repetition of the insertion, transplacental sample, hematic liquid, early bleeding) and postoperative risk factors (pelvic pain, hematic losses, liquid losses, spasmodic pain, fever). In our data the miscarriage incidence was 1% for CVS and 1.7% for amniocentesis. Our results showed that in relation to CVS, the presence of fibroids gives an OR of miscarriage of 68 (95% C.I.=6.50-659.78; $p=0.000$). In relation to amniocentesis, the incidence of hematic losses gives an OR of miscarriage of 10 (95% C.I.=1.50-32.94; $p=0.04$). If these results were confirmed by other experiences, they could induce obstetricians to avoid CVS in these women with uterine fibroids and hence recommend amniocentesis to them. Particular attention has to be taken in those patients with vaginal bleeding following amniocentesis.

Key words: Chorionic villus sampling, amniocentesis, fetal loss rate

Introduction

Over the last decades, obstetricians have directed their attention to the identification and prevention of prenatal pathology. Consequently, use of prenatal invasive procedures, such as Chorionic Villus Sampling and Amniocentesis, led to an important step forward in prenatal diagnosis. All patients who undergo these invasive procedures get to know the risks and benefits of the exam, using an *informed consent*.

The Chorionic Villus Sampling, was executed for the first time in 1966 and since then, the procedure, has greatly improved due to common use. It is executed between the 10th and 12th week of pregnancy from trophoblastic cells, for relative karyotypes and fetal DNA analysis (1, 2).

Amniocentesis on the other hand, was first introduced in the 1950s for sex determination, and was later applied in clinical practice in 1966 to obtain fetal cells for karyotyping (3). In the last 30 years the most common indication for amniocentesis has been increased maternal age. It is also offered for the diagnosis of various disorders either by DNA based analysis, enzymatic analysis or by the use of polymerase chain reaction for the detection of congenital infections. It is executed between the 16th and 18th week of pregnancy.

One of the leading obstacles limiting spread of the procedure lies in the frequent incidence of complications represented especially by miscarriage.

Complications due to CVS have unanimously been agreed to be more consistent compared to am-

niocentesis with percentages that range between 1.5% to 4% versus 0.5-2% given by amniocentesis (4-8).

However, the experience of the operator undoubtedly reduces the entity of these complications.

In the present experience we analyse the possible complications that emerge following the procedures (9-12).

Methods

In this retrospective analysis of case records between 2000 and 2002, the study group included 1489 women who underwent prenatal invasive diagnostic procedure. 438 underwent CVS: their average age was 35.8; the average gestational age 11 weeks and 2 days.

The other 1051 women underwent amniocentesis: their average age was 37.2; the average gestational age 16 weeks and 2 days.

All participants were registered and their demographic data recorded. A detailed history was taken before the procedures, which included the number of first and second trimester miscarriages or terminations of pregnancies, the number of previous deliveries, stillbirths, neonatal deaths, as well as episodes of vaginal bleeding in the current pregnancy and the indications for actual exam (table 1).

The following data was taken into consideration for each woman who underwent these invasive diagnostic procedures: anamnestic risk factors (recurrent pregnancy losses, fibroids, twin birth, uterine hematic loss); intraoperative risk factors (repetition of the insertion, transplacental sample, hematic liquid, early

bleeding) and postoperative risk factors (pelvic pain, hematic losses, liquid losses, spastic pain, fever). These last factors were evaluated with the aid of a questionnaire given to the women during the examination, and these were duly filled and returned to hospital five weeks after the tests.

The incidence of risk factors was analysed (table 2), and comparison between CVS and amniocentesis in relation to risk of miscarriage was done. The univariate χ^2 test was used for the statistical analysis.

Results

From the statistical comparison between CVS and amniocentesis, it resulted that, repetition of the sample was more frequent in CVS with respect to amniocentesis (12.8% vs 2.3%; $p=0.00$). Hematic losses were observed more frequently in those who underwent CVS (6.8% vs 1.9%; $p=0.00$); while spastic pain, appeared to be more frequent in amniocentesis compared to CVS (8.9% vs 5%; $p=0.01$).

Miscarriages that occurred in this 5-weeks period were analysed as well. After CVS, the percentage of fetal loss was 0.9% while following amniocentesis, the percentage resulted to be 1.7 without any statistical difference between two results.

We would like to emphasise the fact that, in those patients who underwent CVS and later miscarried, the incidence of fibroids was 75 %, hematic losses 25% versus only 4% and 6.6% in women who carried on with the pregnancy ($p=0.00$). In those who underwent amniocentesis, the frequency of hematic losses was hi-

Table 1. Indications for CVS and Amniocentesis

	CVS		Amniocentesis	
	Total	%	Total	%
Study of group	438	100%	1051	100%
Age	376	85.84%	782	74.41%
Positive Tritest	5	1.14%	144	13.7%
Markers of chromosomal disease (ultrasound)	24	5.48%	42	4%
Presence of previous chromosomal or malformative fetal disease (during previous pregnancy)	27	6.16%	19	1.81%
Suspected fetal infection			35	3.33%
Other indications	6	1.38%	29	2.76%

Table 2. Incidence of risk factors

	CVS	Amniocentesis
<i>Anamnestic risk factors</i>		
- recurrent pregnancy loss	7.9%	9.5%
- fibroids	5%	5.2%
- twin birth	1.8%	1.1%
- uterine hematic losses	5.3%	5.1%
<i>Intraoperative risk factors</i>		
- repetition of insertion	12.8%	2.3%
- transplacental sample		19.7%
- hematic liquid		1.7%
- early bleeding		5.8%
<i>Postoperative risk factors</i>		
- pelvic pain	19.2%	15.8%
- hematic losses	6.8%	1.9% (p=0.00)
- liquid losses	4.6%	5.6%
- spastic pain	5%	8.9% (p=0.01)
- fever	0.4%	0.4%

gher in women those miscarried (11%) compared to those who carried on pregnancy (1.7%) (p=0.00).

In chorionic villus sampling, only the presence of uterine fibroids is clinically relevant and shows a considerably higher risk of miscarriage with an odds ratio of 65.52 (95% C.I.=6.50-659.78; p=0.000). In amniocentesis, there is an evident increase in the risk of miscarriage in presence of hematic losses with an odds ratio of 7.049 (95% C.I.=1.50-32.94; p=0.04).

Discussion

CVS and amniocentesis are procedures of prenatal invasive diagnostics which do not lack complications, in particular in the first week following the exams.

Our analysis had mainly two objectives: the first was to analyse the actual incidence of the procedure's complications in our Department; and the second was to identify the risk factors that increase the incidence of miscarriage, related to invasive procedures, and hence prevent these factors.

From the analysis carried out on 1489 women, the following was observed: the incidence of anamnestic risk factors was similar, among the two groups of patients (13.9% vs 15.6%; n.s.).

In relation to the incidence of intraoperative risk factors (repetition of the insertion, transplacental sample, hematic liquid, early bleeding), these appeared in 23% of those who underwent amniocentesis, versus 13% in those who underwent CVS. However, this higher incidence in risk factors in amniocentesis could be related to the higher number of factors analysed, specific for amniocentesis and absent in CVS. In fact, the only factor observed in CVS was repetition of the insertion with an incidence of 13%.

The incidence of postoperative risk factors, was apparently the same in both groups, though the finding of hematic losses was more frequent in CVS compared to amniocentesis (6.8% vs 1.9%; p=0.00), while the finding of spastic pain was more common in amniocentesis compared to CVS (9% vs 5%; p=0.01).

From our analysis, it thus results that the occurrence of postoperative risk factors is the same in both procedures.

From the evaluation of miscarriage's incidence, five weeks after the exam, a 1% incidence was observed for CVS while it reached 1.7% for amniocentesis. The statistical difference was not significant.

In the second part of our analysis we evaluated the distribution of risk factors in relation to miscarriage.

In relation to CVS, the presence of fibroids is reported in 75% of patients that have miscarriages and in only 4% of those that carried on pregnancy. The presence of fibroids gives an OR of miscarriage of 68 (95% C.I.=6.50-659.78; p=0.000).

In relation to amniocentesis, the incidence of hematic losses is higher in patients that had miscarriage (11%) with respect to patients that carried on pregnancy (1.7%). The presence of this risk factor gives an OR of miscarriage of 10 (95% C.I.= 1.50-32.94; p=0.04).

All the other factors, are distributed in same way among the two group of patients.

Finally, our analysis confirms that these invasive procedures are relatively safe and that these are related to miscarriage in a small percentage of cases. The incidence of miscarriage, found in our study, is the same as that reported in literature. If these results were confirmed by other experiences, they could induce obstetricians to avoid CVS in these women with uterine fi-

broids and hence recommend amniocentesis to them. Particular attention has to be taken in those patients with vaginal bleeding following amniocentesis.

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