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SHORT COMMUNICATION

BLOOD CONTAMINATION OF AMNIOTIC FLUID AFTER AMNIOCENTESIS IN RELATION TO PLACENTAL LOCATION

CLAUDIO GIORLANDINO, GIOVANNI GAMBUZZA, PAOLO D'ALESSIO, MARIA LUISA SANTORO, PAOLO GENTILI AND ANTONIO VIZZONE

Artemisia Medical Center, Rome, Italy

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SUMMARY

The aim of the present study was to evaluate blood contamination of the amniotic fluid collected in 20 patients undergoing a second amniocentesis performed 2 weeks after a first procedure that had failed due to *Pseudomonas aeruginosa* contamination of the cell cultures. Red blood cell and haemoglobin concentrations in the amniotic fluid were significantly higher in patients who had undergone a transplacental procedure compared with patients in whom the placenta was not traversed with the needle. For both groups, blood contamination of the amniotic fluid was significantly higher compared with a control group of 20 patients undergoing amniocentesis for the first time. Significant blood contamination of the amniotic fluid after amniocentesis occurs in every instance if evaluated at a 'second-look' procedure; the blood contamination is higher when an anterior placenta is traversed with the needle. The clinical significance of these findings needs to be further evaluated.

KEY WORDS: amniotic fluid; amniocentesis; complications

INTRODUCTION

The progress made in the field of prenatal diagnosis, which now also includes the application of molecular biological methods in order to identify the DNA or RNA sequences of infectious agents, has led to the increasing use of amniocentesis in obstetrical practice. However, the possibility of contamination of the fetal circulation and of amniotic fluid by maternal blood at the time of amniocentesis, and the subsequent risk of transmission of a maternal blood-borne infection to the fetus, must be considered (Giorlandino *et al.*, 1994a).

Several studies have addressed the importance of placental location in feto-maternal haemorrhage (Mennuti *et al.*, 1980, 1983; Thomsen *et al.*, 1983; Lenke *et al.*, 1985) but data on materno-fetal contamination and the subsequent risk of fetal infection are lacking.

The aim of the present study was to evaluate amniotic fluid blood contamination in patients who had undergone a repeat genetic amniocentesis at 17–18 weeks of pregnancy after the first procedure performed at 15–16 weeks had resulted in cell culture failure, and to correlate this intra-amniotic blood contamination to the transplacental compared with the non-transplacental procedure performed at the first attempt.

MATERIALS AND METHODS

We recently reported on a series of 4564 consecutive genetic amniocenteses performed at a gestational age of 15–16 weeks between 1 January 1991 and 31 December 1992 (Giorlandino *et al.*, 1994b). In the above series, amniotic fluid cell

Addressee for correspondence: Claudio Giorlandino, MD, Artemisia Medical Center, Viale Liegi 49, I-00198 Rome, Italy.

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ultrasound in every case after a transplacental procedure (11 cases), and in 83 out of 220 cases (38 per cent) after a non-transplacental procedure. An attempt to indirectly quantify the extent of blood contamination in the amniotic cavity was based on the duration of streaming emanating from the puncture site on ultrasound after withdrawal of the needle; the bleeding was classified as large (lasting for more than 30 s) in 55 per cent of the cases after a transplacental and in 8 per cent of the cases after a non-transplacental procedure.

In the present series, we confirm the indirect ultrasonographic evidence produced by Towers *et al.* (1993) of more significant bleeding after transplacental amniocentesis by using direct evaluation of the amniotic fluid. The evaluation of the haemoglobin and red blood cell contents of the amniotic fluid in patients who had undergone a repeat amniocentesis 12–14 days after a first procedure provides direct evidence of the more significant exposure of the amniotic cavity to blood contamination when an anterior placenta is traversed with the needle in comparison with a procedure in which the placenta is not traversed; the importance of the different contamination with the two approaches with regard to the possible transmission of a blood-borne disease needs to be clarified. Significant bleeding, however, also occurs after a non-transplacental procedure, as demonstrated by the blood contamination in patients undergoing a repeat non-transplacental amniocentesis. The obstetrician should not be lulled into a false sense of security by the retrieval of clear amniotic fluid after amniocentesis. Intra-amniotic bleeding occurs after retrieving the needle from the amniotic cavity in almost every instance, as demonstrated by the blood contamination of all fluids collected at the 'second-look' procedure. A limitation of the present study is that no differentiation between maternal and fetal bleeding was made. It has been reported that the intra-amniotic maternal:fetal blood ratio is more than 1:3 in 45 per cent of cases and less than 1:3 in 55 per cent of cases (Young *et al.*, 1977).

In conclusion, this series gives evidence of significant blood contamination of the amniotic fluid after transplacental and, to a lesser extent, non-transplacental amniocentesis. The clinician should therefore be cautioned to reconsider the indication for amniocentesis in cases of maternal infection, especially when the placenta is located anteriorly. In the latter case, every effort should be made to avoid the placenta in order to reduce the magnitude of intra-amniotic bleeding, so as to theoretically reduce the risk of transmitting a maternal infection to the fetus. The clinical importance of these findings, however, needs to be further evaluated.

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