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Escherichia coli Sepsis Following Second-trimester Amniocentesis

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Amniocentesis is a safe procedure with low risk for complications including infection.
A case of genetic amniocentesis followed by *Escherichia coli* sepsis is reported. Bacteriological data showed positive blood cultures to *Escherichia coli*. The mechanisms of infection are discussed: contamination from the instruments, systemic dissemination of bacteria coming from an asymptomatic intra-amniotic infection and inoculation of the placenta with a needle passing through the bowel.
Key-words: amniocentesis; sepsis; *Escherichia coli.*

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INTRODUCTION

Maternal complications related to amniocentesis are rare, occurring in less than 1/1000 procedures (1,2). There is little information regarding major septic complications secondary to diagnostic amniocentesis. The incidence of intra-amniotic infection is about 0-1% and the risk of development of subclinical infections after serial amniocentesis does not exceed 0.5% (3). The occurrence of a septic shock is associated with serious complications including acute respiratory distress syndrome (ARDS), disseminated intravascular coagulation and acute renal failure. The incidence of post amniocentesis sepsis is extremely rare and, after literature review, only 7 cases of septic shock have been reported (2,3), without cases described in Portugal.

CASE REPORT

A 34-year-old nulliparous woman underwent genetic amniocentesis at 16 weeks of gestation for abnormal screen test. The procedure was performed under continuous ultrasound guidance, without technical problems and under sterile conditions with a 22-gauge needle. A total of 20 ml of clear fluid was obtained. The patient did not have any medical comorbidities and she was not obese. Eight hours after the procedure, she developed fever (40ºC), chills, malaise and abdominal pain. She presented to our hospital (emergency room) with fever, hypotension and tachycardia. Fetal demise was diagnosed by ultrasound. Antibiotics (ampicilin+gentamicin+metronidazol) were initiated and dilatation and evacuation were performed. Bacteriological data showed positive blood cultures to *Escherichia coli*. Pathology revealed products of conception with evidence of acute inflammation, culture of placenta positive to *Escherichia coli* and *Klebsiella pneumoniae*, and cervical and vaginal swabs positive to *Escherichia coli*. Fetal chromosome analysis was normal (46,XY). Microscopic exam of the fetus showed necrosis with overgrowth of bacterias. The patient slowly improved and was discharged on day 10.

Serologic exams (CMV, Rubeola, Toxoplasmosis and VDRL) and other rotine exams were repeated with normal results. Pathology products of vaginal and cervical were positive to *Eschericia coli*. She was medicated with amoxicilin/clavulanate and Urovaxom® during 6 months. Cervical and vaginal control was positive 6 months later.

DISCUSSION

The incidence of sepsis following amniocentesis is very low. Hovav et al (4) reported a case due to *Clostridium perfringens* and Fray et al (5) reported another case due to *Clostridium welchii*. Five cases due to *Escherichia coli* have also been reported (6,7,8). All of these women survived with 3 requiring hysterectomy (5,6). Ayadi et al (3) described a case of fatal sepsis due to *Escherichia coli* following a second-trimester amniocentesis.

Our case raises several questions concerning the mechanism of infection.

First, contamination from the instruments can not be excluded. Skin contamination is one theory, but is unlikely since that type of infection is usually caused by *Staphylococcus* species. Another possibility is that the infection might already be present before amniocentesis. Goldstein et al (8) have described an incidence of 5% of assymptomatic intra-amniotic infection with intact membranes. Amniocentesis may also lead to silent rupture of membranes, causing an ascending infection of the vaginal

flora (in the present case the patient had vaginal culture positive to *Escherichia coli*). Finally, we cannot exclude that, at the time of amniocentesis, a needle may passed through the bowel and inoculate the amniotic fluid. However, the cause of infection, as in most of these cases, remains unknown.

To decrease the risk of infection from amnioentesis, several steps can be taken: meticulous sterile technique, checking the sterility of all instruments used and dates sterilized, and using ultrasound guidance to observe the needle throughout the procedure.

Other suggestions for decreasing infection include the use of sterile ultrasound gel and individually packed containers of povidone-iodine. Gram-negative bacteria can live in liquid povidone-iodine, yet be killed when it dries. The benefit of prophylactic antibiotics is unknown and not recommended.

This case is a reminder that amniocentesis, which is commonly carried out, can be associated with very serious consequences. Although it is a routine procedure in prenatal diagnosis and is nowadays performed in most clinics under continuous ultrasound guidance and aseptic conditions, it is an invasive procedure carrying potencial risks of serious complications for both the mother and the fetus. However the indications for amniocentesis must be carefully evaluated by counsellors and the information given to the subjects before the procedure must be clear, and should include exact rates of possible complications.

As demostraded by this case and the literature, the management of intra-amniotic infection after amniocentesis should be aggressive with early antibiotics use and uterine evacuation.

The authors suggest a prophylactic treatment during 6 months with antibiotic regime that cover *Escherichia coli* specimens and perform cervical and vaginal swabs during pregnancy every 3 months.

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