Microbial Findings in Amniotic Fluid Following Serial Amniocentesis

D Plecas,
M Terzic,
M Jevremovic,
M Aleksic.

University Clinical Center,
Clinic of Gynaecology and Obstetrics,
Belgrade, Yugoslavia

Abstract : *In order to determine the reliability of amniocentesis (ACT) and its influence on intraamniotic infection (IAI) development, we performed a study of sixty complete microbiological examinations of amniotic fluid specimens obtained by serial ACT. In one case during the second procedure, E. coli was discovered and in the other, during the third ACT, Candida albicans was presented. Neither spontaneus abortion nor preterm labour were provoked by the procedure. We can conclude that ACT has been confirmed as a safe and successful intrauterine intervention if it is made in the proper way. (Thai J Obstet Gynaecol 1991; 3:53-56.)*

Key words: intraamniotic infection, microbiological findings, serial amniocentesis

Fetus in utero is in a sterile environment, protected from contact with most microorganisms. It is regarded as a compromised host, because its specific and nonspecific immune mechanisms are deficient[1,2].

Infections of feto-maternal compartment are both common and potentially life-threatening to the mother and her fetus. These infections can range from mild to severe or may even go unnoticed[3,4]. With the onset of labour or with membranes rupture bacteria from the lower genital tract commonly ascend into the amniotic cavity. This is the most common pathway for intraamniotic infection (IAI) development[5]. Occasional cases of IAI with intact membranes and without labour support a presumed hematogenous or transplacental route of infection[6]. Less commonly, IAI may develop as a consequence of obstetric procedures such as cervical cerclage, diagnostic amniocentesis (ACT) and intrauterine transfusion[7,8].

The aim of this study was to investigate the influence of serial amniocentesis on IAI development.

Materials and Methods

This study comprised 16 patients in whom amniocentesis was

performed twice and 6 with three subsequent interventions. In two gravidas, serial collections of the amniotic fluid specimens were made five times. Specimens for analysis were taken at intervals of 2-3 weeks. First, ultrasound examination was performed to select a site on the maternal abdomen for insertion of the needle into the amniotic sac. If possible, insertion through the placenta was avoided. After a site was chosen and marked, the abdomen was cleaned with an antiseptic solution and, under real-time ultrasound guidance, a 20- or 22-gauge spinal needle was inserted transabdominally into the amniotic sac. After the stylet was removed, the first amniotic fluid specimen was aspirated into the syringe and used for microbial testing, and the second specimen was sent for the ACT analysis. A specimen from the first syringe was cultivated in blood and endoagar and tyoglicolate medium for microbial propagation, and then incubated in thermostate at 37° C over 24 hours. The material was resume to allow further analysis of microbes.

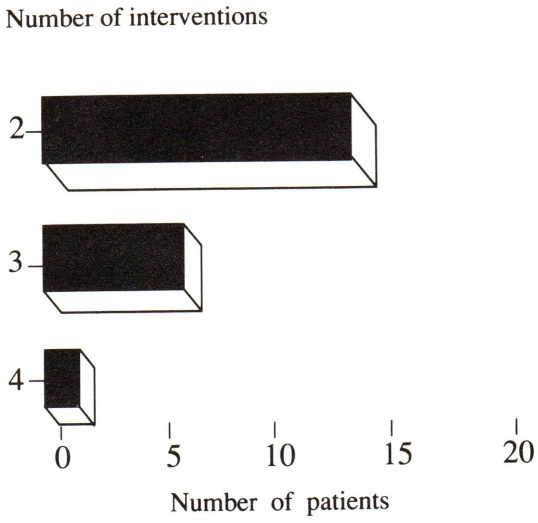

Fig. 1 Serial amniocentesis in studied patients .

Results

Sixty complete microbiological examinations of the amniotic fluid specimens obtained by serial ACT were performed. Amniotic fluid was collected twice in 16 patients, three times in six and in two gravidas as much as five times (Figure 1). In one specimen obtained by the second procedure E. coli was present,while in the other, after the third ACT, Candida albicans was isolated. No spontaneous abortion or preterm labour were provoked by ACT.

Discussion

There are few well-designed prospective studies that prove the beneficial effects of ultrasonography before ACT[9,10]. The ultrasound is useful during the procedure for the following purposes of a) to confirm fetal viability and gestational age and b) to determine placental location in order to avoid blood-contaminated specimens[8]. According to the literatures clinical evidence of IAI is seen in only about 1% of pregnancies and is associated with an increase in maternal and perinatal morbidity and mortality[6,11,12]. IAI in fact, occurs predominantly in patients with ruptured membranes and after the onset of

labour. This ascending route of infection from the lower genital tract is the most common mode of infection[4, 13, 14]. There are, however, many reported cases of documented IAI in patients without labour or rupture of membranes[2,8,15]. Miller et al[17] reported on 23 "selected" afebrile asymptomatic women in labour before 36 weeks and found ten positive amniotic fluid cultures (43%), five on primary plating and five in broth only. Bobitt et al[16] found six positive amniotic fluid cultures (21%) among 29 apparently afebrile asymptomatic women in preterm labour with intact membranes before 35 weeks. Traditionally, the mode of infection in these patients is thought to be hematogenous or transplacental. Recently, it has been recognized that IAI, especially subclinical, can occur secondary to ascending infection in the face of intact membranes[6]. In recent investigations, using ACT in the evaluation of preterm labour, it has been found that 3% to 26% of gravidas were culture-positive with intact membranes[5,6,14]. In our study, in two cases the presence of microbes in amniotic fluid specimens were observed. Numerous investigations suggest that ACT leads to IAI in about 0-1% of patients[8]. However, no one has studied the influence of serial amniocentesis on the development of this pathologic state. Our study revealed the presence of microorganisms in only two amniotic fluid specimens after the second and third procedure.

In conclusion, ACT under ultrasound control has been confirmed as a safe and successful intervention without risk for IAI if it is done in the proper way.

References

1. Harger JH, Meyer MP, Amortegui A, Macpherson TA, Kaplan L, Mueller-Heubach E. Low incidence of positive amniotic fluid cultures in preterm labor at 27-32 weeks in the absence of clinical evidence of chorioamnionitis. Obstet Gynecol 1991; 77: 228-34.
2. Yoder RP, Gibbs RS, Blanco JD, et al. A prospective, controlled study of maternal and perinatal outcome after intra-amniotic infection at term. Am J Obstet Gynecol 1983; 145: 695-8.
3. Ferguson MG, Rhodes PG, Morrison JC, Pucker CM. Clinical amniotic fluid infection and its effect on the neonate. Am J Obstet Gynecol 1985; 151: 1058-62.
4. Hardt NS, Kostenbauder M, Ogburn M, et al. Influence of chorioamnionitis on long-term prognosis in low birth weight infants. Obstet Gynecol 1985; 65: 5-9.
5. Soper DE, Mayhall CG, Dalton HP. Risk factors for intraamniotic infection. A prospective epidemiologic study. Am J Obstet Gynecol 1989; 161:562-8.
6. Skoll MA, Moretti ML, Sibai BM. The incidence of positive amniotic fluid cultures in patients in preterm labor with intact membranes. Am J Obstet Gynecol 1989; 161: 813-6.
7. Blanco JD, Gibbs RS, Krebs LF, Castaneda YS. The association between the absence of amniotic fluid bacterial inhibitory activity and intra-amniotic infection. J Infect Dis 1982; 147: 650-4.
8. Tabsh K. Genetic amniocentesis in multiple gestation: A new technique to diagnose monoamniotic twins. Obstet Gynecol 1990; 75: 296-8.
9. Karp LE, Rothwell R, Conrad SH, Hoehn HW, Hickok DE. Ultrasonic placental localization and bloody taps in mid-tri-

mester amniocentesis for prenatal genetic diagnosis. Obstet Gynecol 1977; 50: 589-93.

10. Nolan GN, Schmickel RK, Chantaratherakitti P, Knickerbocker C, Hamman J, Louwsma C. The effect of ultrasonography on midtrimester genetic amniocentesis complications. Am J Obstet Gynecol 1981; 140: 531-4.
11. Garite TJ, Freeman RK. Chorioamnionitis in the preterm gestation. Obstet Gynecol 1982; 59: 539-41.
12. Gibbs RS, Castillo MS, Rodgers PJ. Management of acute chorioamnionitis. Am J Obstet Gynecol 1980; 136:709-12.
13. Kromberg JGR. Bernstein R, Jacobson MJ, et al. A decade of midtrimester amniocentesis in Johanesburg. Prenatal diagnosis, problems and counselling. S Afr Med J 1989; 76: 344-9.
14. Nordenyall M, Sandstedt B. Chorioamnionitis in relation to gestational outcome in a Swedish population. Eur J Obstet Gynecol Reprod Biol 1990; 36: 59-67.
15. Koh KS, Chan FH, Monfared AH, et al. The changing perinatal and maternal outcome in chorioamnionitis. Obstet Gynecol 1979; 53: 730-3.
16. Bobitt JR, Hayslip CC, Damato JD. Amniotic fluid infection as determined by transabdominal amniocentesis in patients with intact membranes in premature labor. Am J Obstet Gynecol 1981; 140: 947-52.
17. Miller JM, Pupkin MJ, Hill GB. Bacterial colonization of amniotic fluid from intact fetal membranes. Am J Obstet Gynecol 1980; 136: 796-804.