Brucella Infection Causing Abortion in Human Beings

E. Zowghi, A. H. Hedayeti[1], A. Ebadi, A. M. Behroozikhah and M. Yarahmadi

Razi Vaccine and Serum Research Institute, PO Box 11365-1558, Tehran, Iran.
1- Feiaz-Bakhsh Hospital, Karadj, Iran

Summary

In a survey on human brucellosis, in a period of 2 years, natural abortions were investigated for Brucella. *A total of 67 foetuses and 203 placentas were collected from Feiaz-Bakhsh Hospital, Karadj. These samples were bactriologically examined and* Brucella *was isolated from 1 foetus and 1 placenta. Both isolates were classified by biovar procedures and were found to be* B. melitensis *biovar 1. The mother of the positive foetus, when serolgically tested for antibodies to* Brucella, *showed a high titre. She had had 2 abortions during previous 18 months. It was postulated that* Brucella *was, possibly, the cause of abortion in the pregnant women.*

Introduction

Localisation of *Brucella* micro-organism in genital organs of animals, particularly ruminants, is a well known fact. In these species, the most intensive lesions occur in the tissues of pregnant uterus and, usually, the result is abortion in the second third of pregnancy. The presence of erythritol in the placenta of animals has been determined as the *Brucella* growth stimulant resulting in abortion due to the multiplication of *Brucella* and the subsequent necrosis and destruction of foetus membranes (Nielson and Duncan, 1990). Although erythritol is absent in the human placenta, the occurrence of abortion due to brucellosis in pregnant women, particularly in the second third of pregnancy, still is a possibility. Likely, the abortion occurs following acute fever and bacteraemia of the mother and toxaemia of the foetus.

Despite the fact that *Brucella* can survive and multiply within the host cells, large number of them undergo destruction and endotoxin is released. In addition to the effect of endotoxin on various tissues of the body, abortion

directly due to endotoxin occurs in animals and, occasionally, in human beings. Therefore, many workers believe that in premature parturition transmission of *Brucella* from placenta to the infant is a possibility (Madkur, 1989). Brucellosis in human beings occurs with involvement of various organs and a variety of manifestations. Infection of the genitourinary system is predominant in animals but accounts for less than 20% of complications of brucellosis in the human. The *Brucella* organisms seem to have a predilection for the reproductive organs of both sexes in persons and animals. They occasionally localise in the human female genital tract. Tubo-ovarian and pelvic abscesses, chronic salpingitis, cervicitis and menstrual disturbances are reported (Spink, 1956; Porreco and Haverkamp, 1974).

In the present study, the results of bacteriological examination of 67 foetuses and 203 placentas are presented.

Materials and methods

In a period of 2 years, from the beginning of 1993 to the end of 1994, sixty-seven foetuses and 203 placentas were collected from Feiaz-Bakhsh Hospital, Karadj, and studied at Razi Vaccine and Serum Research Institute. Samples of spleen, liver, lungs and stomach contents of all foetuses and 4-5 cotyledons of each placenta were cultured on agar plates of serum dextrose medium with antibiotics. All plates were incubated at 37°C in a carbon dioxide incubator for *B. abortus*, and in ordinary incubator for *B. melitensis*. They were examined 4 to 7 days later for *Brucella*-like colonies. The isolates were tested for smooth and rough colonies and examined for agglutinablity by using *B. abortus* and *B. melitensis* monospecific antiserum. Subcultures of colonies were made on *Brucella* agar slopes and incubated at 37°C. The isolates, after being tested for purity, were biotyped using techniques recommended by Alton *et al.* (1988) and Young and Corbel (1989). The sera of some patients were examined for brucellosis by serological tests.

Results

Of the 67 foetuses tested during the period of the study, 1 case was positive for *Brucella* organism. Also, out of 203 placenta-samples examined in this period, 1 case was positive for *Brucella*. Both isolates were identified, by sensitivity to dyes, failure of H_2S production, agglutination with *B. melitensis* monospecific antiserum and lack of Tb phage sensitivity. The mother of the positive foetus had a titre of 1:320 in serum agglutination test

and a titre of 1:80 in 2-Mercaptoethanol test. She had had 2 other abortions during the previous 18 months.

Discussion

The role of bacterium *Brucella* in causing human abortions has not been evaluated by appropriate case-control studies, therefore, it is not yet known whether brucellosis causes abortions in pregnant women more frequently than other bacterial infections (Spink, 1956). Although human placenta does not contain erythritol, the fact that *Brucella* has been recovered from placental tissues and amniotic fluid in women with acute brucellosis indicates that there may be some risk of abortion during the course of brucellosis. The first report on the *Brucella* infection of human uterus dates back to 1907 (Williams, 1907). Perusal of the literature up to 1980s show that *Brucella* organisms have been isolated from human foetuses on numerous occasions (De Forest, 1917; Kristensen, 1929; Carpenter and Boak, 1931; De Carle, 1931; Janbon and Kerleau, 1939; Hagebusch and Frei. 1941; Williamson, 1944; Poole *et al.*, 1972; Sarram *et al.*, 1974; Schreywer *et al.*, 1980) . Oran *et al.* (1983) reported a premature baby, with *B. abortus* infection, whose mother had a high *Brucella* agglutination titre and had given birth to another premature baby the year before. In 1985, many cases of abortions due to *B. melitensis* were reported from Saudi Arabia (Mohammed *et al.*, 1985; Madkur *et al.*, 1985). Lubani *et al.* (1988) reported three Arab new-borns whose mothers had *Brucella* infection during pregnancy. Other cases of abortions and premature new-borns were reported in 1990 and 1992 (Labrune *et al.*, 1990; Al-Eissa and Mofada, 1992). The difference in manifestation of brucellosis in ruminants and the man, that ruminants but not human beings routinely abort their foetuses, is attributed to the presence of erythritol in the ruminant placenta. However, transmission of infection through placenta to the foetus and isolation of *Brucella* from foetus or premature new-born and placenta have been frequently reported in human beings (Al-Eissa and Al-Zamil, 1991; Al-Eissa and Mofada, 1992; Benjamin and Annobil, 1992) and is prevalent in endemic areas. The isolation of *B. melitensis* from 2 abortion cases corroborates the findings by other workers. It is inferred that *Brucella* can infect human chorioamniotic tissues during pregnancy and may induce abortion. However, this is not unique to *Brucella* and generally reflects the severity of bacterial infection, it may occur following infection by many other micro-organisms.

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