

Serologic Study of Bacterial and Viral Causes of Abortion and Fetus Death in the Patients Referring to Imam Khomeini Hospital of Sari Northern Iran

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Abstract: Infectious agents during pregnancy are very important not only threatening maternal health, but also causing fetus death and congenital disorders. It was decided to have serologic study of the infectious agents (*Listeria monocytogenes*, *Mycoplasma*, cytomegalovirus and rubella) Leading to abortion in women. This descriptive study was done on 150 pregnant women age range of 26.35 ± 4.85 years with spontaneous fetus death in early months of pregnancy and referring to Imam Khomeini hospital for abortion. In this study two blood samples of each 7ml were drawn on the first day of referring and after two weeks for determining of antibody titer against *Listeria monocytogene*, *Mycoplasma*, rubella and cytomegalovirus by ELISA, cold agglutination, direct and in direct immunofluorescence methods using Diagnostic kit from Erma Company. In this study, 16% had 5-fold higher antibody titer against *Listeria monocytogenes*, 42%, 1.5 to 5-fold higher for rubella; 6%, 2.5-4 fold for *Listeria monocytogenes* and 9% 1.5 to 2-fold higher for cytomegalovirus. All of them in the repeated examination showed higher antibody titer. Fetus death was observed during different stages of pregnancy in the women positive antibody for *Listeria monocytogenes*, cytomegalovirus and rubella. In 80% positive *Listeria monocytogenes* antibody fetus death occurred on the end of the second trimester (week 23-26). Since the infectious agents have very important role in fetus death, knowledge of the pregnant women on the prevention method and using of correct method is very important.

Key words: Fetus death, *Listeria monocytogenes*, *Mycoplasma*

INTRODUCTION

Abortion with pelvic infection and systemic dissemination of infection is known as septic abortion^[1]. Infectious agents are very important from the view point of pregnant women health. Approximately 5% of maternal death reported to the disease control centers is related to septic abortion^[1]. Bacterial, viral and parasitic infections with their direct and indirect effects are the important cause of fetus death^[1]. *Listeria monocytogenes* is one of the intrauterine infectious agents and the cause of abortion. Pregnant women are very sensitive to the infection with this organism^[2]. Reports by Abraham^[1] about the effect of *L. monocytogenes*, indicated defect on the fetus growth at the beginning of pregnancy^[2]. *L. monocytogenes* is transmitted via food and is very important pathogen, because can persist within a long term in food materials kept in improper condition in and be transmitted during food processing^[3]. *Mycoplasmas* (*hominis* and *Ureaplasma urealyticum*) are one of the main inflammatory agents in genital system and cause pathologic immune complex and destruction of placenta membrane, during pregnancy, as a result, abortion^[4].

Report given by Mazor *et al.*, in 1995 on the women who had abortion and divided in two groups of positive and negative *Mycoplasma* antibody, indicated that in the first group there was more cases of abortion and fetus death^[5,6]. Cytomegalovirus (CMV) for causing congenital infection is the main world health concern and transmission of infection to fetus generally occurs during the acute phase^[7]. Studied the intra uterus transmission of CMV during pregnancy in women by PCR method. CMV can cause fetus death and duration of pregnancy has no effect on the process of infection in fetus^[8]. Rubella has world prevalence, its epidemy and pandemy occur every 6-10 years and every 20-25 years, respectively^[7]. It causes hypoplasia in neonate and abortion in pregnant woman^[7]. Since this infection has teratogenic consequence, therefore it causes more defects when occurs in early stage of pregnancy^[7].

The pregnant women infected with rubella, found that though vaccination had full coverage in the Israeli population but still rubella could be a serious health threatening in the pregnant women^[9]. Fetus death has mental consequences for the parents. This study was designed for serologic study of *L. monocytogenes*,

Mycoplasma, CMV and rubella infections in the women who had abortion.

MATERIALS AND METHODS

In this descriptive study, 150 pregnant women referring to the Khomeini Hospital of Sari Township had spontaneous abortion and selected for finding of *L. monocytogenes*, Mycoplasma, CMV and rubella antibody. After 2 weeks, antibody titer for the above said organisms were studied by ELISA, cold agglutination and indirect immunofluorescence methods using Diagnostic kit Manufactured by Erma Company. Second sampling was done in order to find out the rise of antibody titer as indicator of acute infection. Data about food habit (having roasted meat, cheese, milk, non pasteurized cream and uncooked vegetables), date of pregnancy while aborting, vaccination for rubella were recorded in questionnaire. Those will history of abortion due to genetic disorders, drug toxicity and hormonal, addiction therapy, cigarette, surgery and mechanical abortion were excluded from this study.

By referring to the instructions given on the standard kit, titers of 1:20 and higher for rubella and Listeria; titer of 1:15 and higher for CMV; and more than 1:64 for Mycoplasma were considered positive.

RESULTS

In this study, 150 women, mean age of 26.35 ± 4.85 years who had abortion or fetus death were under trial for the presence of antibody against *L. monocytogenes*, Mycoplasma, CMV and rubella infections. Table 1 shows the IgG titer against the mentioned organisms under study. Twenty four (16%) patients had 5 fold more than normal level of IgG for *L. monocytogenes* on the first day of hospitalization for abortion and two 2- fold or higher rise of antibody after two weeks.

It was found that 22 (98%) listeriosis women had food regimen of roasted meat, unwashed vegetables, smoked fish, unpasteurized milk, cheese and cream. Nine (6%) had 2.5 to 4 fold IgG titer for Mycoplasma and had rise of antibody in the second test. Also 7 (80%) had fetus death at the last trimester of their pregnancy (on the 23rd to 26th of pregnancy weeks). Meanwhile 64 (42%) were IgG and IgM positive for rubella, of them 61 (40%) had 1.5 to 5 fold higher than normal IgG and (2%) were IgM positive. None of them had vaccination against rubella.

In this study, 14 (9%) had 1.5 to 2 fold IgG for CMV and rise of level was observed. Those with antibody against *L. monocytogenes*, rubella and CMV were in their different pregnancy period.

Table 1: IgG antibody titer against rubella, mycoplasma, listeria and CMV and the number women who had abortion

Infectious agents	IgG titer on the first day of referring to hospital	IgG titer after 10 days	No	(%)
<i>L. monocytogenes</i>	1:100	1:400-1:1600	24	16
Mycoplasma	1:60-1:256	1:480-1:640	9	6
Rubella	1:30-1:100	1:40-1:400	64	42
CMV	1:25-1:30	1:62-1:75	14	9

DISCUSSION

In this study, 16% of the women under study had positive and increasing titer of IgG for *L. monocytogenes*. *L. monocytogenes* is transmitted orally through consumption of roasted meat, non pasteurized milk, cheese, smoked fish, uncooked vegetable and the cooked food contaminated during preparing^[3,10,11,12,13]. Microbiological and ecological studies of *L. monocytogenes* show that the food at any stage of processing and preparation can be prevented from contamination^[1,2,4,6]. In most cases *L. monocytogenes* is isolated from cheese, egg, non pasteurized milk, smoked fish and roasted meat^[10]. Since the women under study had high risk of acquiring bacterial infection in their food regimen, hence they must have oral transmission of bacteria. Listeria can easily spread from cell to cell through placental vessel endothelial cell and this intracellular life leads to the escape from phagocytosis^[3]. This study showed fetus death in the pregnant women with antibody against listeriosis at different stages of pregnancy, which corresponding the data given by Fuches^[14]. Six percent of the women under study had increasing titer of Mycoplasma IgG which is same as to the finding of Horowitz^[5] showing the relationship between Mycoplasma antibody and early labour and abortion^[5,6].

In 5 (80%) of the women with Mycoplasma antibody fetus death occurred at the end of second trimester (23-26 weeks). Fetus death can occur as a result of establishment of bacteria in cervix, infection of amnion and inflammation of placenta membrane^[4,6].

Nine percent of the women with increasing titer of for CMV IgG, fetus death was observed at different stages of pregnancy which is similar to the report^[15] showing fetus death during pregnancy^[15]. Following activation of CMV chronic infection, we found that (42%) of pregnant women had antibody for rubella, of them, 2% with IgM and 40% increasing level of IgM for rubella.

Presence IgM for rubella indicating recently acquired infection which will not last more than 6 weeks. IgM against rubella lasts life long. For confirmation of recently acquired rubella infection in the pregnant women which is

important, detection of either increase of IgG titer in two sera samples obtained within 2 weeks interval or IgM antibody in one serum sample are necessary^[7]. It was shown that in 40% of women, infection with rubella virus occurred 6 weeks prior to fetus death.

No doubt, if serologic evaluation of rubella be performed at pregnancy period, certainly can prevent fetus death and maternal infections. Since the cases under study had no history of abortion causing infection or fetus death (anatomical, genetical, hormonal, environmental or drug). Increase in titer of antibody against *L. monocytogenes*, CMV, Mycoplasma and rubella showing the host immune response against active infection. The above mentioned agents can be the cause of abortion or fetus death but further relevant studies are required.

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