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Listeria Infection as the Possible Cause of The Spontaneous Abortion in Fertile Age of Women

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Abstract

The present study aims to detect the Possible Causes of Spontaneous Abortion in Fertile Age Women by Listeria Infection, a case control study was conducted, including 65 aborted women and 30 healthy women, the results found significant changes in birth number (p 0.016) and in Listeriae infection level (IgG+IgM) (p 0.001) which elevated in the aborted women. the abortion trimester shows that high percentage of abortion were at the first trimester (70.96%), the abortion number mean was (3.86±1.76), low percentage was smokers in both groups in non-significant differences and high percentages of employments in both groups, high percentage of aborted women have an age less than 29 years and lower percentage have aged >40 years, the Listeriae level (IgG+IgM) didn't affect by age, the Listeriae level (IgG+IgM) according to smoking and occupation were non-significantly affected. The correlation between Listeriae level (IgG+IgM) and the abortion number shows significant positive correlation with abortion number in the first trimester (p 0.024), and non-significant association with n of abortion in the second trimester (p 0.770). The correlation between Listeriae level (IgG+IgM) and no. of birth shows non -significant inverse association (p 0.102), and non-significant association with abortions number (p 0.344). The present study concluded that the abortion can be caused by Listeria Infection of pregnant women in the first trimester.

Keywords
Listeria Infection, Possible Cause, Spontaneous Abortion, In Fertile Age, Women.

The infection by the bacteria *Listeria monocytogenes* causes Listeriosis disease that transmitted by contaminated food by this bacteria (Karakašević, 1987). The most individuals sensitive to this infection are the weakened immune system, newborn and fetus. The infection transfer to the fetus in pregnant women, causing abortion, dead birth, premature birth and child with listeriosis (Kalenić & Mlinarić-Missoni, 2001; Vázquez-Boland et al., 2001) the pregnant women tend to more infected than healthy women in about 20 times (Adams, 2002). *Listeria monocytogenes* is G+ bacterium with chop stick form, found in water and earth and motile it has survival ability because it lives below between (3-40°C) and resistance to cooling drying and heating conditions (Seeliger, 1986). Thus, it can be found in cooling, contaminated meat and milk and some vegetables (Hof & Nichterlein, 1998). The infection by *listeria* intact gastrointestinal tract then transfer by phagocytes to other organs causes microabscesses and can be transfer to the fetus through placenta causes 10% of the neonatal sepsis (Kuzmančić, 2003; Mačvanin, 2005). In early study the first description of *Listeria* infection in human has been recorded (Bille, Rocourt, & Swaminathan, 2002). About 1000 cells of *Listeria monocytogenes* can be provoked disease in weakened immune persons (Center for Food Safety and Applied Nutrition, October 21, 2003; Teftedarija & Đorđević, 1985). The Listeriosis in pregnant women shows regularly the tendency to chronicity, that persisted an enough time saprophytically and its activated through the pregnant to become virulent. Cusses spontaneous abortion and it was seen more times the on the genital organs (Mateus et al., 2013).

Methodology

A case control study was conducted in Al karkh general hospital in Baghdad city, the study included 65 abortion women and 30 healthy women as a control group, data and blood samples were collected according to ethical approval and written consensus of each individual. screening recombinant (IgM+IgG) by ELISA kit was used to detect level (IgG+IgM) of infection, Data were represented as mean ±SD, Independent sample t test, X^2 and ANOVA one way were used for significant detection, correlations used for detection correlation among variables at p less than 0.05.

Results

The Present study was suggested the role of Listeria Infection in The Spontaneous Abortion In a Fertile Age of Women, results exhibit non-significant changes in age (p 0.790), birth number (p 0.016) that was lower in abortion women than the control group, and in Listeriae infection level (p 0.001) which elevated in the aborted women (0.13±0.06) than control group (0.08±0.02). the abortion trimester shows that the a high percentage of abortion were at the first trimester (70.96%) than second trimester (29.03%), finally the abortion mean was (3.86±1.76) than healthy which didn't suffer from abortion, low percentages were smokers in both groups in non-significant differences (p 0.172), the percentage of occupation women are high in both groups also in non-significantly (p 0.711), a high percentage of aborted women with age less than 29 years (47.54%) and lower percentage have age >40 years (13.11%) in non-significantly (p 0.4617) in comparison with control group (table 1).

Table (1) distributions the socio-demographic variables of study groups.

Variables	Control	Patients	P
Age	30.20±6.98	30.61±6.98	0.790
Abortion number	0	3.86±1.76	-
Birth number	2.44±1.72350	1.52±1.67	0.016
First trimester	0	70.96%	-
Second trimester	0	29.03%	-
Listeriae level (IgG+IgM)	0.08±0.02	0.13±0.06	0.001
Smoking			
Yes	3	14	0.172
No	27	51	
Occupation			
Yes	23	52	0.711
no	7	13	
Age categories			
29>	47.54	33.33	
39-30	39.34	36.66	0.4617
>40	13.11	23.33	

There are three categories of age depended in the current study (<29, 30-39, >40), the Listeriae level (IgG+IgM) didn't affect by age, non-significant differences observed in all age categories in patients and control groups (table2)

Table(2) the effect of age on the Listeriae level (IgG+IgM) in the study groups

Age categories	Control	Patients
<29	0.089±0.029	0.12±0.07
30-39	0.086±0.023	0.12±0.05
>40	0.089±0.039	0.14±0.06
P*	0.956	0.751
*ANOVA one way , p <0.05		

The Listeriae level (IgG+IgM), according to smoking and occupation are clarified in table (3), there is non-significant effected of smoking in patient (p 0.969) and the control group (p 0.780) in smokers and nonsmokers. occupation don't impact in Listeriae level (IgG+IgM) in occupations women in patient and control (p 0.969, p 0.156).

Table (3) the Listeriae level (IgG+IgM) in study groups according to smoking and occupation.

Study variables	Control	Patients
Smoker		
Yes	0.081±0.002	0.133±0.073
No	0.087±0.030	0.133±0.065
P	0.780	0.969
Occupation		
Yes	0.133±0.063	0.083±0.031
No	0.133±0.082	0.101±0.010
P	0.156	0.969

The correlation between Listeriae level (IgG+IgM) and the abortion number in the first and second trimester shows significant positive correlation with abortion number in first trimester (r 0.288, p 0.024), and non-significant association with n of abortion in second trimester (r 0.038, p 0.770) (figure 1)

The correlation between Listeriae level (IgG+IgM) and no of birth shows non -significant inverse association (r -0.168, p 0.102), and non-significant association with abortion number (r 0.119, p 0.344) (figure 2).

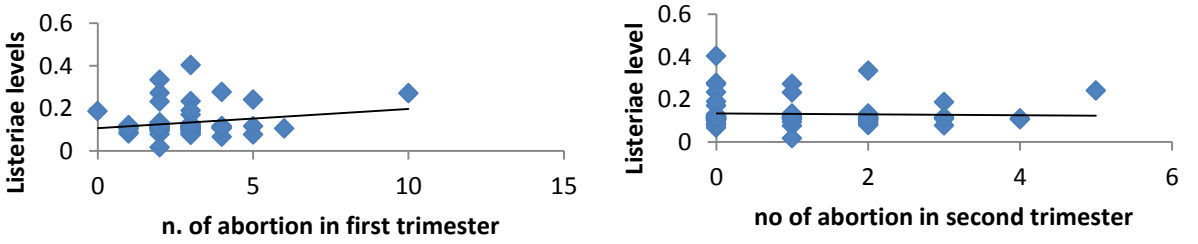

Figure (1) the correlation between number of abortion in the first and second trimester and Listeriae level (IgG+IgM) in pregnancy women.

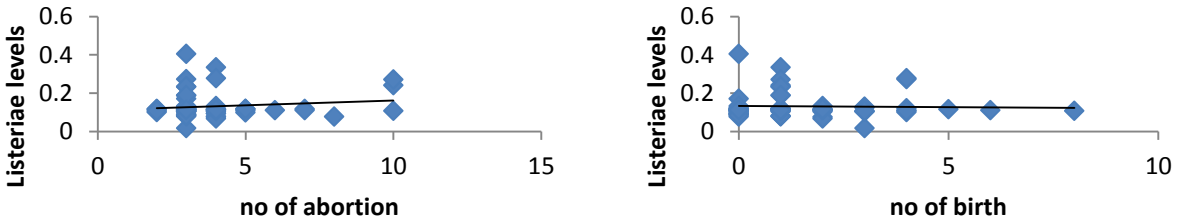

Figure (1) the correlation between number of abortion in the first and second trimester and Listeriae level (IgG+IgM) in pregnancy women.

Discussion

Listeria monocytogenes is an aerobic or (facultative anaerobic) intracellular bacteria positive to gram stain Gram (Mateus et al., 2013), as a result of its transmitted to human via food and its harmful effects in pregnant women the present study was suggested. The contaminated food including uncooked meat, milk and vegetables contributed on about 99% of infection (Farber & Peterkin, 1991; Scallan et al., 2011), the incidence rate of LM sometimes low and associated with high hospitalization and mortality rates (20–50%) (Swaminathan & Gerner-Smidt, 2007). the results of the present study found a significant elevation in Listeria

level (IgG+IgM) in aborted women than healthy groups and this contributed in the increased number of abortions and lowering the healthy birth, moreover Lm level (IgG+IgM) strong associated with abortion in the first trimester and this agree with WHO reports, about 43% of pregnant cases infected are with Listeria during pregnancy and 14% occurred in late pregnancies (Wadhwa Desai & Smith, 2017). to date the incidence index of listeriosis accounts was 11% Italy (Mammina et al., 2013),16% in Spain (Nolla-Salas et al., 1998), and 17.7% in France (Goulet et al., 2012).in china 41.1–52% of listeriosis was associated with pregnancies (Fan et al., 2019; Feng et al., 2013).

The harmful effects of LM in pregnancy happened via transferring LM through the placenta then fetus (Lamont et al., 2011). sometimes cause fetal infection by swallowing amniotic fluid (Li et al., 2020). the fetal infection Unlike mothers causes serious condition, birth, entailing premature, abortion, sepsis, even death or CNS involvement (de Noordhout et al., 2014) the treatment should be applied after infection detection to avoid complication (Charlier et al., 2014).

The time of infection in gestational age is beneficial for influence prognosis of newborns , the early diagnoses of fetal infection by LM causes abortion of 65% of the pregnant women (Girard et al., 2014). the clinical investigation found about 26% of infection cases in the second and third trimester lead to stillbirths, abortion or uterine fetal loss (Silk et al., 2013). unlike the present results Bortolussi et al. (1984) in early study found the LM tends to occur in late pregnancy and it's also proved by other studies (Gray et al., 1993; Pezeshkian et al., 1984). Lamont et al. (2011) clarified the reason of low incidence of early LM infection in pregnant women because the culture of the maternal or embryo blood is rarely applied after pregnancy loss, thus the follow of the medical history of spontaneous abortions must be applied.

Some complication of LM infection in pregnant women and newborn including Neonatal listeriosis, might develop sepsis or meningitis with a mortality rate of 10%and neurological complications (Li et al., 2020).

In spite of the smoking impaired immune system, present output didn't observe effect of smoking in the Listeriae level (IgG+IgM) in pregnant women and didn’t affect by occupation, however high percentage of infected women have aged less than 29 years, Welekidan et al. (2019) found The prevalence of *LM* OF pregnant women higher in the age group 20–24 years, and in house wives, this may because absence awareness of infection source , risk of infection and preventive measures .

The present study concluded that the abortion can be caused by Listeria Infection in pregnant women in the first trimester, thus women should be aware about infection source and early treatment that required during pregnancy to avoid complications to the mother and the fetus.

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