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Microbial Factors Causing Recurrent Miscarriage a Survey Study for Women in the AL Najaf Governorate, Iraq

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Abstract. Background:- One of the important steps in a woman's life is pregnancy, especially the first pregnancy. One of the most important problems facing a woman is abortion, which has a serious psychological impact on her. One of the causes of abortion is the germs etiology that was studying in the current study to know the extent of its spread. Method:- The study included 192 women coming to the infertility unit in Al-Sadr Medical City in the Najaf governorate, who are suffering from abortion because of germ etiology for a period of 6 months, from January to June 2019. Draw 5 ml of blood to determine the presence of IgG, IgM antibodies to confirm the presence of the injury. Result:- The current study showed that the rate of miscarriage resulting from germ etiology varies according to the type of germ, where the incidence of CMV was the highest, followed by rubella virus and toxoplasmosis (17.6, 15.1, 2.6)%, respectively, and the percentages of women who have a previous infection.(45.8,16.7,19.8)%, respectively. Statically analysis:-Data analyzed by using SPSS version 18 software, the categorical changeable was given as percentage and frequencies. Conclusion:- The germ causes that cause abortion in Najaf are spread in varying degrees, but through the results, these infection rates decreased, which is evidence of the spread of health and cultural awareness among Najaf women. Therefore, it was suggested, as the study of the future, to conduct a survey study one year from now to see the extent of the change.

Keywords. miscarriage, cytomegalovirus, Rubella, Toxoplasma, women.

INTRODUCTION

Abortion means in medicine the withdrawal of the pregnancy before twenty weeks by rate (15-20)% the know in medicine when abortion repeat 3 times in a row. it occurs because many factors include ovarian malformation and uterine deformities also abortion caused by many organisms include *Toxoplasma gondii*, Rubella, Cytomegalovirus[1]

Toxoplasma gondii is caused infection by toxoplasmosis is the most spread parasitic disease [2]. rate spread of toxoplasmosis different (10-80)% in various areas of the world[3]. The major ways of people infection via eating uncooked meat, contamination vegetables, and water found another way to rapidly transfer infection from mother to embryo, this infection way could cause miscarriage. The diagnosis of acute toxoplasmosis in pregnant women is very important[4]. *Toxoplasma gondii* infection usually latent infection and formation of cyst in Lung, brain, and tissues[5]. clinically latent toxoplasmosis is asymptomatic but possibly increase the risk of neurological and psychiatric abnormalities also caused many changes in personality such as recurrent migraine, suicide attempt, and brain tumor [6].

Rubella is a viral infection that often presents as a light febrile rash disease and adenopathy in children and adults. sometimes infected people are asymptomatic the infection transfer via direct contact and secretion of nasopharyngeal is containing the virus. The diagnosis of infection depend on Laboratory diagnosis because of the clinical diagnosis is inaccurate. where the laboratory diagnosis based on immunoglobulin G (IgG) antibodies levels in the serum and IgM antibodies levels when an epidemiological case [7]. when the infection occurred in the first months of pregnancy will cause the death of fetal and abortion [8]

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Cytomegalovirus is a type of the Herpesviridae family [9,10]. The virus spreads in the people of lower socioeconomic status and developing countries [11,12]. The women infected by Cytomegalovirus (CMV) and it caused danger fetal malformations such as the head is small, calcification intracranial, and weakness vision and hearing. The virus transfer via sexual contact and body fluids, also the virus possibly spread to fetal from mother when infected at the beginning of pregnancy.[13] Previous studies have shown that the primary infection with CMV in pregnant women is transmitted to the fetus in 40% of cases, and 10% of the newborns have symptoms and 15% without symptoms and that the infection of the virus can occur during any period of pregnancy, but the possibility of infection is in the first three months Much higher than in the last trimester of pregnancy,[14,15]

CMV is difficult to diagnose in pregnant women because there are no specific symptoms of infection but similar to those of the flu and other symptoms such as fatigue, sore throat, and muscle aches [16] Previous studies indicated the presence of virus antigen in miscarriage remains, but the role of the virus in recurrent pregnancy loss is unknown [17] as some studies showed an increase in the level of antibodies in recurrent miscarriages, and others a decrease in antibodies level. [18]

The current study aimed to know the extent spread of repeated miscarriage due to germs etiology in women coming to hospitals in AL Najaf Governorate

METHODS AND MATERIALS

The place of study:- in infertility unit /AL Sader Medical city in AL Najaf governorate.

The studied sample:- women infected with abortion attending the infertility unit / AL Sader city in AL Najaf.

Study design:- survey study.

Period of study:- 6 months starting from January to Juley month.

Sample size :- 192 women coming to the infertility unit in Al-Sadr Medical City in the Najaf governorate.

Study steps:-clinical examination and laboratory diagnosis.

Inclusion criteria:- Women with miscarriages with germ causes.

Exclusion criteria:- Women with miscarriages with non-germ causes.

Serologic study:- at after draw 5 ml venous blood samples, isolated the serum and kept at(-70)until diagnosis IgG and IgM antibodies for *Toxoplasma gondii*, Rubella, CMV by used Enzyme-Linked Immunosorbent Assay (ELISA) kit(Trinity Biotech, Jameston, N, Y, USA

STATISTICAL ANALYSIS

Data analyzed by using SPSS version 18 software, the categorical changeable was given as percentage and frequencies.

RESULTS

The current study showed that all age groups are susceptible to abortion, but the category (20-24) year is the most likely age group to experience abortion, as the shear percentage formed 29.2% (table 1).

TABLE 1. shows the study sample by dependent on age groups .

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-19	41	21.4	21.4	21.4
	20-24	56	29.2	29.2	50.5
	25-29	30	15.6	15.6	66.1
	30-34	37	19.3	19.3	85.4
	35-39	16	8.3	8.3	93.8
	40-44	12	6.3	6.3	100.0
	Total	192	100.0	100.0	

Also, the current study showed that 17.8% of women had current an infection with CMV and 45.8% had an old infection depending on the positive test of IgG and IgM antibodies. (table 2)

TABLE 2. Shows the frequency of cytomegalovirus infection by dependent on positive for IgG and IgM.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	IgG+; IgM+	34	17.8	17.8	17.8
	IgG- ; IgM-	70	36.5	36.5	51.0
	IgG+ ; IgM-	88	45.8	45.8	96.9
	Total	192	100.0	100.0	

TABLE 3. Shows the frequency of Toxoplasmosis infection by dependent on positive for IgG and IgM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	IgG+; IgM+	5	2.6	2.6	2.6
	IgG- ; IgM-	149	77.6	77.6	79.2
	IgG+ ; IgM-	38	19.8	19.8	99.0
	Total	192	100.0	100.0	

The study recorded rate15.1% of women with Rubella virus, 16.7% of women had an old infection, while the percentage of women with Toxoplasmosis was 2.6% and 19.8% had an old infection (Table 3, 4)

TABLE 4. Shows the frequency of Rubella infection by dependent on positive for IgG and IgM.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	IgG+; IgM+	29	15.1	15.1	15.1
	IgG- ; IgM-	131	68.2	68.2	81.8
	IgG+ ; IgM-	32	16.7	16.7	98.4
	Total	192	100.0	100.0	

DISCUSSION

Recurrent Abortion (RA) in all-inclusive communities is a common event and frequently changes among various communities. [19] approximately 30% of women that suffer from a miscarriage in their lifetime, The affected by risk factors, infection-related, endocrine, genetic, hemostasis-related, and factors of immunity.[20] Toxoplasma, Cytomegalovirus, and rubella are cause uterus infection and are responsible for miscarriage, congenital anomalies, and premature infant. [21]

This venture was done to show the commonness of Microbial factors causing recurrent miscarriage in ladies with the early loss of pregnancy. Cytomegalovirus, Toxoplasma, and Rubella are known to cause disease in the uterus. often responsible for the loss of embryo, congenital malformation, and premature delivery, the detection of such disease can prevent mortality of the infants born to such mothers [22]. These microbes are common pathogens and affect all age groups and diseases without symptoms but infection in women in the first trimester of pregnancy may cause birth defects [23,24] . This is confirmed by the current study, although the age group (20-24) was the most affected age, 29.2 % of the total study sample. (figure 1). In a case-control study, Ebadi et al. (2011) showed a significant association between miscarriage and infection with CMV [25].

The positive of IgM means to found an acute infection, while IgG antibodies may increment in the month after disease and progressively ascends for a long time at that point stay in a low level for the rest time, while the repeated infection may cause a high immunizer rate for longer time (Kumar et al., 2004) [26].

Accordingly, the current study showed that the percentage of women infected with CMV was 17.8% recent infection, while 45.8% had an old infection (Table 2). This is in agreement with what is proven globally, as CMV is the most common cause of congenital viral infections (0.2- 2.5)%, as the infection causes placentitis, mental retardation, and sensorineural hearing loss in the fetus. [27,28,29] Viruses appear to be the most frequently involved pathogens since some of them can produce chronic or recurrent maternal infections. In particular, cytomegalovirus during pregnancy can reach the placenta by viremia, following both primary and recurrent infection, or by ascending route from the cervix, mostly the following reactivation[30].

The rate of Rubella infection was 15.1%, and the old infection was 16.7%(Table 3). As it affects children often but it can affect adults and it causes congenital rubella syndrome if it infection pregnant women, so in developed countries, using the special rubella vaccine for its preventive action against CRS [31]

While the results recorded 2.6% of a recent infection with toxoplasma and 19.8% of old infections (Table 4). Toxoplasma is transmitted to humans through water and contaminated food or eating foods that are not well cooked, so their prevalence rates vary according to several factors, including social conditions, food habits, and lifestyle, for example, Italy has recorded 18%, Egypt 67.5% and Brazil 58.5%. To reduce the infection rate, educational programs that urge to get away For cats, cooking good food, and washing hands is done by health institutions to reduce the risk of infection. [32]

CONCLUSION

Through the results, it appears that CMV is the most microbial cause of miscarriage in infected women in AL Najaf, followed by German measles (Rubella)virus while the lowest rate of toxoplasma

REFERENCES

1. M. sharbatkhori, Y. dadi moghaddam, A.S. pagheh, R. Mohammedi, H. H. mofidi, and S. shojaee seroprevalence of *Toxoplasma gondii* infections in pregnant women in gorgan city, golestan province, Northern Iran. Iran J Parasitol. 2014;9:181–7.
2. M. Selseleh , H. Keshavarz, M. Mohebali, S. Shojaee, M. Selseleh, M. R. Eshragian, F. Mansouri, M. H. Modarressi. Production and evaluation of *Toxoplasma gondii* recombinant GRA7 for serodiagnosis of human infections. Korean J Parasitol. 2012;50:233–8.
3. D Hill , J P Dubey. *Toxoplasma gondii*: transmission, diagnosis and prevention. Clin Microbiol Infect. 2002;8:634–40.
4. J Flegr , D Q Escudero . Impaired health status and increased incidence of diseases in Toxoplasma-seropositive subjects - an explorative cross-sectional study. Parasitology. 2016 Dec;143(14):1974-1989. doi: 10.1017/S0031182016001785. Epub 2016 Oct 10. PMID: 27719690.
5. S. Shojaee, A. Teimouri, H. Keshavarz, S. J. Azami, and S. Nouri . The relation of secondary sex ratio and miscarriage history with Toxoplasma gondii infection. BMC Infect Dis. 2018 Jul 5;18(1):307. doi: 10.1186/s12879-018-3228-0. PMID: 29976155; PMCID: PMC6034284.
6. G. Tipples , J. Hiebert. Detection of measles, mumps, and rubella viruses. Methods Mol. Biol., 2011,665: 183-93. PMID: 21116802
7. P Canepa , L Valle, E Cristina, D De Florentiis, V Parodi, F Banfi, M Zancolli, P Durando, G Icardi, F Ansaldi. Role of congenital rubella reference laboratory: 21-months-surveillance in Liguria, Italy. J. Prev. Med. Hyg., 2009.50: 221-226. PMID: 20812517.
8. Tsahel A.D., Z. A.Toliafeh, and A. M. Salih . seroprevalence of cytomegalovirus (cmv) and detection of bacteria in aborted women. Plant Archives Vol. 19, Supplement 2, 2019 pp.2030-2033.
9. Bagheri L, Mokhtarian H, Sarshar N, Ghahramani M. Seroepidemiology of cytomegalovirus infection during pregnancy in Gonabad, east of Iran: a cross-sectional study. J Res Health Sc. 2012; 12(1): 38-44.
10. Choobineh H, Alizadeh S, Yazdi MS, Vaezzadeh F, Dargahi H, Pourfatholah A. Serological Evaluation of major beta thalassemia patients below15 for cytomegalovirus infection in Iran. Res J Biologic Sci. 2009; 2: 584-89.
11. Choobineh H, Alizadeh S, Sharifi yazdi M, Vaezzadeh F, Dargahi H, Pourfatolah A. The effect of repeated transfusions on active cytomegalovirus infection, in the presence of IgM, in patients with thalassemia major in Iran. Payavard Salamat. 2007; 1(1): 8-16.
12. Marin LJ, Santos de Carvalho Cardoso E, Bispo Sousa SM, Debortoli de Carvalho L, Marques Filho MF, Raiol MR, et al. Prevalence and clinical aspects of CMV congenital infection in a lowincome population. Virol J. 2016; 13(1): 148.
13. Lanzieri TM, Dollard SC, Bialek SR, Grosse SD. Systematic review of the birth prevalence of congenital cytomegalovirus infection in developing countries. Int J Infect Dis. 2014; 22: 44-8.
14. S G Ralph [1], A J Rutherford, J D Wilson. Influence of Bacterial vaginosis onconception and miscarriage in the first trimester. BMJ, .(1999),319: 220-223.
15. Mirambo M, Chibwe E, Mushi M, Majigo M, Mshana S. Cytomegalovirus, parvovirus B19 and rubella co-infection among pregnant women attending antenatal clinics in Mwanza City: The need to be considered in Tanzanian Antenatal Care Package. Epidemiology 2016; 6(230): 2161-165.
16. Habibi M, Bahrami A, Morteza A, Sadighi Gilani MA, Hassanzadeh G, Ghadami M, et al. Study of cytomegalovirus infection in idiopathic infertility men referred to Shariati hospital, Tehran, Iran. Iran J Reproduct Med. 2014; 12(2): 151-54.
17. Nigro G, Mazzocco M, Mattia E, Di Renzo GC, Carta G, Anceschi MM. Role of the infections in recurrent spontaneous abortion. J Matern Fetal Neonatal Med. 2011; 24(8): 983-89.
18. Ghafourian M, Ayandeband N, Fardipour A, Kooti W, Foroutanrad M, Badiee M. The role of CD16+ , CD56+ , NK (CD16+ /CD56+) and B CD20+ cells in the outcome of pregnancy in women with recurrent spontaneous abortion. Int J Wom Health Reprod Sci. 2015; 3: 61-6. [
19. R.J. Abdul Khalid, S. T. Mohammed, A.AH. Abbas. Seroprevalence of *Rubella*, *Cytomegalovirus*, *Herpes*, and *Toxoplasma Gondii* in Recurrent Aborted Women in Baghdad . Pakistan Journal of Biotechnology . 2017
20. Vomstein K, Aulitzky A, Strobel L, Bohlmann M, Feil K, Rudnik-Schöneborn S, Zschocke J, Toth B. Recurrent Spontaneous Miscarriage: a Comparison of International Guidelines. Geburtshilfe Frauenheilkd.

2021 Jul;81(7):769-779. doi: 10.1055/a-1380-3657. Epub 2021 Apr 23. PMID: 34276063; PMCID: PMC8277441.
21. Ma YY. Effects of cytomegalovirus infection in pregnant women to fetuses: study with DNA-DNA hybridization method. *Zhonghua fu chan ke za zhi*. 1992;27(6):355-8. 380.
22. A.Aynioglu , O.Aynioglu , ES.Altunok .Seroprevalenceof *ToxoplasmagondiiRubella* and *Cytomegalovirus* a mong pregnant females in north-western Turkey. Acta Clin Belg. 2015;70:321–324.
23. D. Karad , A. Kharat. Seroprevalence of Torch Infections in Bad Obstetrics History in HIV and Non-HIV Women in Solapur District of Maharashtra India. J Hum Virol Retrovirol. 2015;2:00067.
24. M.C.Sirin, N. Agus, N.Yilmaz, A. Bayram, Y. K. Derici, P. Samlioglu, S. Y. Hanci, and G. Dogan.. Seroprevalence of Toxoplasma gondii, Rubella virus and Cytomegalovirus among pregnant women and the importance of avidity assays. *Saudi medical journal*, (2017). *38*(7), 727–732. https://doi.org/10.15537/smj.2017.7.18182.
25. Ebadi P, Yaghobi R, Eftekhar F, Bagheri K. Seroprevalence of CMV and Rubella in women with recurrent spontaneous abortion in comparison with normal delivery. *J Fasa Univ Med Sci*. 2011;1(3):136-41.
26. M. D. Paschale, C. Agrappi, M.T. Manco, A. Paganini, and P. Clerici Incidence and risk of *Cytomegalovirus* infection during pregnancy in an urban area of Northern Italy. *Infect Dis Obstet Gynecol* 2009; 2009: 206505.
27. Picone,C Vauloup- Fellous,A-G Cordier,I Parent Du Châtelet,M-V Senat,R Frydman,L Grangeot-Keros A 2-year study on *Cytomegalovirus* infection during pregnancy in a French hospital. *BJOG* 2009;116: 818-823.
28. Nigro G, Mazzocco M, Mattia E, Di Renzo GC, Carta G, Anceschi MM. Role of the infections in recurrent spontaneous abortion. J Matern Fetal Neonatal Med. 2011 Aug;24(8):983-9. doi: 10.3109/14767058.2010.547963. Epub 2011 Jan 24. PMID: 21261443.
29. V Koksaldi-Motor 1, O Evirgen1, I Azaroglu2, M Inci 3, B Ozer 3, S Arica. Prevalence of *Toxoplasmosis, Cytomegalovirus* and Rubella IgG antibodies in Hatay women and children. *West Indian Med J* 2012; 61: 154-157.
30. FN Aksakal, I Maral, MY Cirak, R Aygun. Rubella seroprevalence among women of childbearing age residing in a rural region: Is there a need for rubella vaccination in Turkey? *Jpn J Infect Dis* 2007; 60: 157-160.
31. D. Sebastian1, K. F. Zuhara1 and K. Sekaran The influence of the TORCH infections in first trimester miscarriage in the Malabar region of Kerala. *Afr J Microbiol Res* 2008; 2: 56-59.
32. HK El Deeb, H Salah-Eldin, S Khodeer, AA Allah. Prevalence of *Toxoplasma gondii* infection in antenatal population in Menoufia governorate, Egypt. *Acta Trop* 2012; 124: 185-191.