

Knowledge of Cytomegalic Inclusion Disease among a Sample of Pregnant Women in Baghdad City/Iraq

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Abstract

Background: Cytomegalovirus is a common virus that can cause disease in infant's whose mothers are infected with Cytomegalovirus during pregnancy.

Objective: To determine knowledge of pregnant women regarding Cytomegalic inclusion disease.

Subjects and methods: A cross sectional study was carried out in Baghdad City / Iraq, during the period started from the November 2017 to November 2018. Four primary health care centers randomly selected, and data were obtained by direct interview with the pregnant women by using detailed self- reporting questionnaire.

Results: The demographic data was conducted on 360 pregnant women with the age group ranging from 16 to 46 years and the highest percentages (45.8%) were from the 20-29 years. Regarding knowledge of pregnant women about Cytomegalovirus infection revealed that approximately (65%) of them answered correctly for Cytomegalovirus hand hygiene is the best preventive measure, while (49%) know correctly that the Cytomegalic inclusion disease is viral infection. About lowest frequency in (11% and 8%) of pregnant women answered correctly for Cytomegalovirus infections are sub clinical and Cytomegalovirus establishes lifelong latent infection, respectively. More than (80%) of the pregnant women with college and higher educational level know correctly that the Cytomegalovirus infections are sub clinical, most common intrauterine viral infection and Cytomegalovirus is severe disease.

Conclusions: The pregnant women had poor knowledge toward Cytomegalic inclusion disease.

Keywords: knowledge, pregnant women, Cytomegalovirus.

معارف مرض الداء الاشتمالي المضخم للخلايا بين عينة من النساء الحوامل في مدينة بغداد/ العراق أ.م. اشراق احمد جواد و م.م. عادل امين حمة

الخلاصة

المقدمة: يعتبر (CMV) فايروس شائع بسبب امراض للرضع خاصة للامهات المصابة بالفايروس خلال فترة الحمل.

الهدف: هو تحديد معارف النساء الحوامل بخصوص مرض (Cytomegalic inclusion).

طريقة العمل: اجريت دراسة مقطعية في مدينة بغداد – العراق, خلال الفترة الزمنية من تشرين الثاني 2017 ولغاية تشرين الثاني 2018. اختيرت عشوائيا اربع مراكز رعاية صحية اولية, حصلت على المعلومات عن طريق المقابلة المباشرة للنساء الحوامل وسجلت المعلومات من خلال اسئلة موضوعية لذلك.

نتائج الدراسة: شملت المعلومات الديموغرافية 360 امرأة حامل تتراوح اعمارهم بين 16-46 سنة, وجدت اعلى نسبة (45.8%) عند الفئة العمرية 20-29 سنة. وبخصوص معارف النساء الحوامل حول الاصابة بفايروس (CMV) تقريبا كشف عن (65%) ممن كانت اجابتهن صحيحة حول نظافة اليد هي افضل طريقة للوقاية. بينما (49%) معرفتهن صحيحة حول الاصابة هي فايروسية, وحوالي اقل نسبة هي (11% و 8%) من النساء الحوامل اجابتهن صحيحة حول الاصابة (CMV) تعد تحت السريرية, وانها ممكن ان تستقر مدى الحياة متسترة, على التوالي.

اكثر من 80% من النساء الحوامل بمستوى تعليمي جامعي واكثر كانت اجابتهن صحيحة حول الاصابة بفايروس (CMV) هي تحت السريرية, ومعظم الاصابات تعد شائعة داخل الرحم, كذلك يعد (CMV) من الأمراض الشديدة.

الاستنتاجات: وجدت هذه الدراسة ان النساء الحوامل معارفهم ضعيفة بالنسبة الى مرض (Cytomegalic inclusion).

الكلمات المفتاحية: معارف, نساء حوامل, فايروس CMV.

Introduction

Cytomegalovirus (CMV) is the most common causes of intrauterine infection, occurring in 0.2% to 2.2% of all live births, and is a common cause of sensor neural hearing loss and mental retardation [1].

Most healthy people who acquire CMV after birth experience few or no symptoms and no long-term sequel. Some experience a mononucleosis-like syndrome with symptoms including malaise, persistent fever, myalgia, cervical lymphadenopathy, and less commonly pneumonia and hepatitis [2].

Congenital infections are the result of transplacental transmission of CMV. Transmission to the fetus may occur because of primary or secondary maternal infection. The probability of intrauterine transmission following primary infection during pregnancy is 30% to 40%, compared with only 1% following secondary infection. [3]. Ten to fifteen percent of congenitally infected infants will have symptoms at birth including intrauterine growth restriction, microcephaly, hepatosplenomegaly, petechiae, jaundice, chorioretinitis,

thrombocytopenia, and anemia, and 20% to 30% of them will die, mostly of disseminated intravascular coagulation, hepatic dysfunction, or bacterial super infection [4].

Most of the congenitally infected infants (85-90%) have no signs or symptoms at birth, but 5% to 15% of them will develop sequelae such as sensorineural hearing loss, delay of psychomotor development, and visual impairment [5]. The present study aimed to determine the level of knowledge of pregnant women regarding Cytomegalic inclusion disease and associated with educational level of studied samples.

Subjects and methods

Participants in this cross sectional descriptive study that was carried out in four primary health care centers (2 in Al-Karakh and 2 in Al-Rusafa sector) in Baghdad City-Iraq, during the period from November 2017 to November 2018. A total 360 pregnant women were included in the study, in the age group of 16-46 years.

Data were obtained by direct interview with the pregnant women by using detailed self-reporting questionnaire. The questionnaires were generated from information derived from different sources, including a literature review. [6,7]

The questionnaires were divided into two groups and included:

Group (1): Includes socio- demographic characteristics; (age, residence, educational level, occupation).

Group (2): A 17- item self-administered questionnaire was designed to measure knowledge of pregnant women about cytomegalovirus infection, the questionnaire contains (Cytomegalic inclusion disease is viral infection, CMV is serious disease, wasn't severe disease, lack information, CMV infections are sub clinical, serious side effect, establishes lifelong latent infection, CMV hand hygiene is the best preventive Measure, CMV may be transmitted person to person in several different ways, most common intrauterine viral infection, CMV may be transmitted blood transfusions and organ transplantations, infections are transmitted via fecal-oral route, CMV spreads by airborne droplets, CMV is congenital and perinatal infection, CMV can be acquired by infant during delivery and maternal Breast milk, CMV can be cause pneumonia complication in infants and CMV infection may result death of the fetus in uterus).

Statistical analysis: The data was subjected to analysis by using descriptive statistics and tabulation.

Result

The study was conducted on 360 pregnant women with the mean age of 29.4 ± 10.6 years ranging from 16 to 46 years and the highest percentage (45.8%) were from the 20-29 years age group. The majority of studied sample about (91%) were from urban area, with their level of education of secondary school (37%). The highest frequency of pregnant women was seen in house wife occupation about (41.4%), as show in table (1).

Table (1): The distribution of pregnant women according to the demographic characteristics.

Demographic characteristics		No.	%
Age group (years)	< 20	62	17.2
	20-29	165	45.8
	30-39	96	26.7
	40-49	37	10.3
Residence	Urban	328	91
	Rural	32	9
Educational level	Illiterate	40	11
	Primary School	76	21
	Secondary School	134	37
	College and Higher	110	31
Occupation	House wife	149	41.4
	Self- employed	80	22.2
	Government employee	131	36.4
Total		360	100

Table (2); shows the knowledge of pregnant women about Cytomegalovirus infection revealed that approximately (65%) of them answered correctly for Cytomegalovirus (CMV) hand hygiene is the best preventive measure, while (49%) know correctly that the Cytomegalic inclusion disease is viral infection and (42%) not CMV spreads from person to person by airborne droplets, also (37.5%) in CMV is lack information. More than (20%) but less than (30%) of the studied samples know correctly that the CMV is serious disease and not infections are transmitted via fecal-oral route, CMV may be transmitted blood transfusions and organ transplantations, also CMV can acquired by infant during delivery and maternal Brest milk, CMV infection may result death of the fetus in uterus, CMV may be transmitted person to person in several different ways, CMV wasn't severe disease, CMV is congenital and perinatal infection and CMV has serious side effect. About (19%), (14%), (11%), and (8%) of pregnant women answered correctly for CMV is the most common intrauterine viral infection, CMV can be cause pneumonia complication in infants, CMV infections are sub clinical and CMV establishes lifelong latent infection, respectively.

Table (2): Distribution of pregnant women according to their knowledge about Cytomegalovirus infection.

Knowledge of pregnant women	Yes (%)	No (%)	Don't know (%)
1. Cytomegalic inclusion disease is viral infection.	175 (49)	77 (21)	108 (30)
2. CMV is serious disease.	100 (28)	65 (18)	195 (54)
3. CMV wasn't severe disease.	67 (19)	80 (22)	213 (59)
4. CMV is lack information.	135 (37.5)	60 (17)	165 (45.5)
5. CMV infections are sub clinical.	40 (11)	147 (41)	173 (48)
6. CMV has serious side effect.	77 (21)	83 (23)	200 (56)
7. CMV establishes lifelong latent infection.	29 (8)	54 (15)	277 (77)
8. CMV hand hygiene is the best preventive measure.	234 (65)	76 (21)	50 (14)
9. CMV may be transmitted person to person in several different ways. (such as kissing, sexual contact, and getting saliva or urine on your hands and then touching your eyes, or the inside of your nose or mouth).	81 (22.5)	117 (32.5)	162 (45)
10. CMV is the most common intrauterine viral infection.	67 (19)	88 (24)	205 (57)
11. CMV may be transmitted blood transfusions and organ transplantations.	97 (27)	79 (22)	184 (51)
12. CMV infections are transmitted via fecal-oral route.	95 (26)	102 (28)	163 (46)
13. CMV spreads from person to person by airborne Droplets.	86(24)	151 (42)	123 (34)
14. CMV is congenital and perinatal infection.	80 (22)	84 (23)	196 (55)
15. CMV can acquired by infant during delivery and Maternal Brest milk.	93 (26)	37 (10)	230 (64)
16. CMV can be cause pneumonia complication in infants.	49 (14)	98 (27)	213 (59)
17. CMV infection may result death of the fetus in uterus.	84 (23.3)	70 (19.4)	206 (57.3)

CMV = Cytomegalovirus

Table (3); shows the distribution of knowledge cases about Cytomegalovirus infection and educational level, more than (80%) of the pregnant women with college and higher educational level know correctly that the CMV infections are sub clinical about (82.5%), but (82%) CMV is the most common intrauterine viral infection and (81%) CMV is severe disease, and revealed that approximately above (70%) of the answered correctly for (CMV infection may result death of the fetus in uterus, CMV infections are not transmitted via fecal-oral route and CMV may be transmitted blood transfusions and organ transplantations). While (61- 69%) of the studied

sample in college and higher educational level know correctly that the Cytomegalic inclusion disease is viral infection, not spreads by airborne droplets, can acquired by infant during delivery and maternal Brest milk, CMV is serious disease, establishes lifelong latent infection, transmitted person to person in several different ways, and CMV is congenital and perinatal infection. But more than (50%) know correctly that the CMV has serious side effect and CMV is lack information, except (49%, 43%) of them answered (CMV can be cause pneumonia complication in infants and CMV hand hygiene is the best preventive measure).

Table (3): Distribution of knowledge pregnant women about Cytomegalovirus infection and Educational level.

Educational level Knowledge of pregnant women	College And Higher NO.(110)	Secondary School NO.(134)	Illiterateand Primary School NO.(116)	Total (%)
	Yes (%)	Yes (%)	Yes (%)	
1. Cytomegalic inclusion disease is viral infection.	107 (61)	53 (30)	15 (9)	175 (100)
2. CMV is serious disease.	65 (65)	27 (27)	8 (8)	100 (100)
3. CMV wasn't severe disease.(NO)	65 (81)	15 (19)	0 (0)	80 (100)
4. CMV is lack information.	71 (52.5)	44 (32.5)	20 (15)	135 (100)
5. CMV infections are sub clinical.	33 (82.5)	7 (17.5)	0 (0)	40 (100)
6. CMV has serious side effect.	42 (54.5)	35 (45.5)	0 (0)	77 (100)
7. CMV establishes lifelong latent infection.	19 (65.5)	8 (27.5)	2 (7)	29 (100)
8. CMV hand hygiene is the best preventive measure.	101 (43)	98 (42)	35 (15)	234 (100)
9. CMV may be transmitted person to person in Several different ways. (such as kissing, sexual contact, and getting saliva or urine on your hands and then touching your eyes, or the inside of your nose or mouth).	54 (67)	18 (22)	9 (11)	81 (100)
10. CMV is the most common intrauterine viral infection.	55 (82)	12 (18)	0 (0)	67 (100)
11. CMV may be transmitted blood transfusions and organ transplantations.	69 (71)	23 (24)	5 (5)	97 (100)
12. CMV infections are transmitted via fecal-oral route.(NO)	74 (72.5)	16 (16)	12 (11.5)	102 (100)
13. CMV spreads from person to person by Airborne Droplets.(NO)	93 (61.6)	50 (33.1)	8 (5.3)	151 (100)

14. CMV is congenital and perinatal infection.	55 (69)	19 (24)	6 (7)	80 (100)
15. CMV can acquired by infant during delivery and Maternal Brest milk.	59 (63)	34 (37)	0 (0)	93 (100)
16. CMV can because pneumonia complication in infants.	24 (49)	19 (39)	6 (12)	49 (100)
17. CMV infection may result death of the fetus in uterus.	61 (73)	19 (22.5)	4 (4.5)	84 (100)

CMV = Cytomegalovirus

Discussion

Cytomegalovirus poses an important public health problem because of its high frequency of congenital infections, which may lead to severe congenital anomalies. In apparent infection is common during childhood and adolescence. In the present study, (49%) of them answered correctly knowledge for Cytomegalic inclusion disease is viral infection and classic cytomegalic inclusion disease derives from the propensity for massive enlargement of CMV-infected cells [6].

CMV is a common virus that can infect people of all ages. Once the virus enters your body it stays there for life, but a healthy immune system keeps the virus in check. Most people infected with CMV will never have any symptoms. At present, the (28%) of the studied samples know correctly that the CMV is serious disease, while (21%, 11%) CMV has serious side effect and infections are sub clinical, respectively. This similar with other study especial Adler *et al*, 2015. So that most women with CMV infection have no symptoms and over 90% of congenitally infected infants have no clinical signs of infection in the neonatal period, most congenital infections pass unrecognized [8].

Congenital CMV infection at birth may manifest with symptoms such as generalized petechiae, direct hyperbilirubinemia, hepatosplenomegaly, purpuric rash, microcephaly, seizures, focal or general neurologic deficit, retinitis and intracranial calcifications. However, 90-95% of infants with congenital CMV infection will have no clinically apparent symptoms (asymptomatic) at birth. Most congenital CMV infections go unnoticed in the nursery since the majority of infected newborns will have no clinically apparent disease at birth [9].

When the immune status before pregnancy is unknown, determination of primary CMV infection should be based on detection of specific IgM antibody. However, IgM can also be detected in 10% of recurrent infections and can be detected for months after primary infection. Therefore, the group of women designated CMV-IgM positive could include women with primary infection acquired before pregnancy and a few women with recurrent infections. The IgG avidity assay can help distinguish primary infection from past or recurrent infection and can assist in determining when infection occurred [10].

A woman is infected with CMV for the first time during pregnancy (primary infection), the risk that her baby will get infected is about 30-50%. Only 10-15% of these babies will show symptoms of infection at birth. Babies born with symptoms of CMV infection may have small red spots on their skin, seizures and problems with their liver, spleen and eyes. Most of these symptoms will go away within a few weeks or months. Eighty-five to ninety percent of babies that are born with a CMV infection (congenital CMV), will not show any symptoms at birth. Most of these babies will not develop problems from the disease later on. However, 10-15% of babies with congenital CMV that do not show symptoms at birth will still develop some of the long term effects such as hearing loss and learning difficulties [11].

The results obtained from our study, less than (30%) of the pregnant women know correctly that the CMV may be transmitted person to person in several different ways especially is spread by saliva, semen, vaginal fluids, blood, urine, tears, feces, or breast milk. A pregnant woman can also pass CMV to her unborn baby. A baby that is born with a CMV infection is said to have congenital CMV. About 0.2-2.5% of babies worldwide have congenital CMV [12].

Infected with CMV during pregnancy, a test called amniocentesis can be done to see if the baby has been infected. This test takes some fluid around the baby (amniotic fluid) and looks for signs of the virus. There is a small risk for miscarriage with amniocentesis (about one half of one percent) [11].

Early studies of the presence of CMV in human breast milk using cell culture technique on colostrums or unseparated milk samples demonstrated a prevalence of CMV in breast milk of 13% in women without consideration of their CMV serostatus. On the other hand, 68% was reported in lactating mothers of infants with known congenital CMV infection. [12].

Other studies using fresh breast milk have documented varying rates of CMV transmission to premature infants. Mosca *et al.* documented 25% (5/20) postnatal CMV transmission to premature infant's less than 34 weeks gestational age after exposure to CMV

positive milk. None of these infants demonstrated clinical evidence of infection. CMV infection was demonstrated by the detection of viral DNA or virus in the infant's urine or saliva a median of 34 days after CMV was detected in the mother's milk. [13].

Miron *et al.* demonstrated CMV transmission in breastfed premature infants of seropositive mothers. Four of 70 neonates (5.7%) were infected in the first 3 to 7 weeks of life. One infant developed severe disease with acute respiratory changes, hemodynamic instability, and hepatosplenomegaly accompanying the identification of CMV in the urine. [14].

Screening for CMV by serology has been and still is a debated issue. Routine serologic screening for pregnant women has never been recommended by any public health authority. The screening, if done, should be performed at the beginning of pregnancy or even prior to a planned pregnancy. If a woman is seronegative, repeated examinations during pregnancy should be done when there is clinical suspicion. However, screening is usually done before pregnancy for diseases such as rubella and varicella against which immunization can be provided, whereas there is currently no effective and safe immunization against CMV. [1].

Our study also shows that highest frequency (65%) of them answered correctly for CMV is the best way to prevent infection is to practice good hygiene. This similar with other study Woolf *et al.* 2013. Wash your hands after changing diapers and after contact with urine, feces, or saliva. Mouth-to-mouth kissing with children attending day-care is discouraged. Pregnant women should refrain from sharing food, drink, and eating utensils. All women who have more than one sexual partner should use latex condoms during intercourse. [11]

Also in the present study, shows the distribution of knowledge cases about Cytomegalovirus infection and educational level, for all pregnant women with college and higher educational level have a good or acceptable knowledge about Cytomegalovirus infection compare with pregnant women secondary, primary school and illiterate educational level have poor knowledge about Cytomegalovirus.

Finally, we concluded the pregnant women had poor knowledge toward Cytomegalic inclusion disease, but acceptable knowledge with college and higher educational level of the studied samples. And we recommend that health educational programs are needed to improve pregnant knowledge, toward Cytomegalovirus infection, and further studies among mothers, patients, secondary students, teachers and general population are needed assess the knowledge toward Cytomegalovirus.

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