

The Incidence of Fetal Death that Associated with Cytomegalovirus and Toxoplasmosis in Pregnant Women with COVID-19

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Abstract:

In the current study, 100-blood samples were collected from aborted women who attended Imam Ali Hospital\Baghdad, Iraq during the period from 1st March to 15th December 2020. The results showed that the distribution of COVID-19, *Toxoplasma* and CMV within the age group (20-29) years was as follows: *Toxoplasma* 2 (2.0%), COVID 18 (18.0%) and CMV 0 (0.0%), while their distribution within the age group (30-39) years was as follows: *Toxoplasma* 2 (2.0%), COVID 9 (9.0%) and CMV 0 (0.0%), whereas the distribution of these infections within the age group (40-49) years was as follows: *Toxoplasma* 0 (0.0%), COVID 2 (2.0%) and CMV 5 (5.0%). The prevalence of COVID-19 was 38 (38.0%), while the prevalence of *Toxoplasma* was 11 (11.0%), whereas the prevalence of CMV was 0 (0.0%) in the urban areas. However, within the rural areas, the prevalence of COVID -19 was 58 (58.0%) and Toxoplasmosis was 18 (18.0%) while the prevalence of CMV was 0 (0.0%). In aborted women, 4 (4.0%) of Toxoplasmosis was recorded without CMV infection 0 (0.0%). In patients infected with COVID-19, IgM antibodies were detected in 29 (29.0%) in comparison with CMV infection 0 (0.0%) with a highly significant difference. In conclusion, the age group (20-29) years exhibited a higher prevalence of COVID-19 than other age groups. The COVID-19 infections were predominant in the urban and rural areas than other infections. Additionally, no association between CMV and COVID-19 infections can be noticed, thus This study indicated that no actual participation between those infected with Covid-19 among pregnant women and toxoplasmosis as well as CMV resulted in fetus killing inside the mother's womb.

Keyword: COVOD-19, Toxoplasmosis, CMV, Fetal Death, Pregnant women.

Introduction:

Many observational studies suggested the potential of maternal-fetal transmission of infections, and some of these cases were reviewed below. It is still unclear if these infections are postnatally acquired or they are regarded as vertical transmission infections^[1]. In our review, we will summarize the state up to date knowledge about possible transmission risks of SARS-CoV-2 to the newborns and fetuses. This literature reviews the possibility of congenital of SARS-CoV-2 transmission through analogy with animal models of coronavirus infection. Further continuing studies are required to confirm the potential of analogous congenital coronaviruses transmission in human-beings. ^[2,3], confirmation is required by more extensive studies. There is a great interest whether SARS-CoV-2 should be regarded within the

“TORCH” infections. The TORCH acronym, initially formulated by Nahmias^[4]. Many variants of this acronym emerged in the last 4 decades and the TORCH definition is nowadays more widely identified as heterologous infections that may lead to neonatal diseases after their acquisition by either trans- perinatal or placental ways^[1]. They state that SARS-CoV-2 must be included in the TORCH infection grouping and that efforts must be made for full definition of the transmission mechanism and the disease scope in both neonates and fetuses^[5]. Prevention of transmission strategies, including virological monitoring of pregnant women can be so valuable. Therapeutic procedures for transmission prevention in the neonatal period, including immunotherapies & vaccines also need to be investigated^[6]. For CMV infection, the intrapartum transmissions during vaginal delivery and post-natal acquisition through breast-milk feeding are well-explained^[7]. These transmission routes can complicate the idea of whether an infant undergoing congenital CMV evaluation may acquire *in utero* versus post-natal infections^[8]. Although SARS-CoV-2 may be acquired *in utero*, sufficient evidence is present on pre-natal acquisition that the transplacental mode must be suggested to be a transmission^[9].

Materials and methods:

In the current study, a total of 100 blood samples were collected from aborted women who attended Imam Ali Hospital / Baghdad, Iraq during the period from 1st March to 15th December 2020. The anti covid-19 IgM antibodies were examined by the Vides device and the normal value for infection or not being ≤ 1 . The anti-*Toxoplasma* IgM antibodies were examined by ELISA technique and the normal value is ≤ 1 . While the anti –CMV IgM antibodies were measured also by ELISA technique with the normal value being ≤ 1 .

Statistical analysis: For statistical analysis, the commercial computer program IBM SPSS version 25.0 was used, and data were expressed as a mean \pm standard error, independent t-test at the level 0.05.

Results and Discussion:

The results in Table (1) showed that the distribution of COVID-19, *Toxoplasma* and CMV within the age group (20-29) years was as follows: *Toxoplasma* 2(2.0%), COVID 18(18.0%) and CMV 0(0.0%), while their distribution within the age group (30-39) years was as follows: *Toxoplasma* 2(2.0%), COVID 9(9.0%) and CMV 0(0.0%), whereas the distribution of these infections within the age group (40-49) years was as follows: *Toxoplasma* 0(0.0%), COVID 2(2.0%) and CMV 5(5.0%). The prevalence of COVID-19 was 22(22%) but the prevalence of Toxoplasmosis was 7(7.0%) in aborted females complaining from double action infections.

Table (1): Prevalence of studied group according to age groups (year) for TOXO. IgM, COVID-19 IgM & CMV IgM.

Age groups(year)		TOXO IgM		COVID-19 IgM		CMV IgM		Total
		Negative (-Ve)	Positive (+Ve)	Negative (-Ve)	Positive (+Ve)	Negative (-Ve)	Positive (+Ve)	
20-29	No.	57	2	41	18	59	0	59
	%	57.0%	2.0%	41.0%	18.0%	59.0%	0.0%	59.0%
30-39	No.	34	2	27	9	36	0	36
	%	34.0%	2.0%	27.0%	9.0%	36.0%	0.0%	36.0%

	%	34.0%	2.0%	27.0%	9.0%	36.0%	0.0%	36.0%
40-49	No.	5	0	3	2	5	0	5
	%	5.0%	0.0%	3.0%	2.0%	5.0%	0.0%	5.0%
Total	No.	96	4	71	29	100	0	100
	%	96.0%	4.0%	71.0%	29.0%	100.0%	0.0%	100.0%

In Table (2), it was shown that the prevalence of COVID-19 in the urban areas was 38(38.0%) and *Toxoplasma* was 11(11.0%), while CMV was 0(0.0%). However, in the rural area, the prevalence of COVID -19 was 58(58.0%) and Toxoplasmosis was 18(18.0%), while CMV was 0(0.0%).

Table (2): Distribution of studied groups according to residency regarding COVID-19 IgM, TOXO IgM & CMV IgM.

Residency		COVID-19 IgM		TXO IgM		CMV IgM		Total
		Negative (-Ve)	Positive (+Ve)	Negative (-Ve)	Positive (+Ve)	Negative (-Ve)	Positive (+Ve)	
Urban	No.	38	38	30	11	41	0	41
	%	38.0%	38.0%	30.0%	11.0%	41.0%	0.0%	41.0%
Rural	No.	58	58	41	18	59	0	59
	%	58.0%	58.0%	41.0%	18.0%	59.0%	0.0%	59.0%
Total	No.	96	96	71	29	100	0	100
	%	96.0%	96.0%	71.0%	29.0%	100.0%	0.0%	100.0%

The prevalence of COVID-19 was 22(22%) but Toxoplasmosis was 7(7.0%) in aborted females complaining from double action infections as shown in table (3).

Table (3): Distribution of the studied groups according to the *Toxoplasma* IgM and COVID-19 IgM.

TOXO IgM		COVID-19 IgM		Total
		Negative (-Ve)	Positive (+Ve)	
-Ve	No.	60	22	82
	%	60.0%	22.0%	82.0%
+Ve	No.	11	7	18
	%	11.0%	7.0%	18.0%
Total	No.	71	29	100
	%	71.0%	29.0%	100.0%

There were 4(4.0%) of Toxoplasmosis that were registered without CMV infection 0(0.0%) with abortion as shown in table (4).

Table (4): No association between *Toxoplasma* IgM and CMV IgM infections with abortion.

TOXO IgM		CMV IgM		Total
		-Ve	+Ve	
-Ve	No.	96	0	96
	%	96.0%	0.0%	96.0%
+Ve	No.	4	0	4
	%	4.0%	0.0%	4.0%
Total	No.	100	0	100
	%	100.0%	0.0%	100.0%

In patients infected with COVID-19, IgM antibodies were detected in 29(29.0%) in comparison with CMV infection 0(0.0%) with a highly significant difference as illustrated in table (5).

Table (5): distribution of the study groups according to COVID-19 IgM and CMV IgM.

COVID-19 IgM		CMV IgM		Total
		-Ve	+Ve	
-Ve	No.	71	0	71
	%	71.0%	0.0%	71.0%
+Ve	No.	29	0	29
	%	29.0%	0.0%	29.0%
Total	No.	100	0	0
	%	100.0%	0.0%	0.0%

The association of infections between *Toxoplasma* parasite, on the one hand, and COVID-19 and CMV on the other hand may kill the fetus of pregnant women. According to the age group, the distribution of COVID-19 in the age group (40-49) years was higher than the age group (30-39) years, and it is more common than *Toxoplasma* and CMV in these two age groups in pregnant women. These results disagreed with (Jankowiak, Lu. *et al*, 2020), who reported that in spatial structure analysis of the association between date of first COVID-19 infection, an incidence of toxoplasma infection and GDP per capita, and the findings of such analysis have not confirmed a direct causal association between toxoplasmosis and susceptibility to COVID-19 pandemic^[10]. The prevalence of COVID-19 in the urban area was higher than *Toxoplasma gondii* infection, however, in the rural area, COVID-19 infection was higher than Toxoplasmosis. These findings agreed with (Rasmussen S.A. and Jamieson D.J. 2020) who found that till now, the morbidity & mortality of SARS-CoV-1 and MERS-CoV-2 infections during pregnancy may be so severe for SARS-CoV-2 and it was distributed in the rural areas higher than the urban areas. But most reviews revealed no evidence of trans-placental SARS-CoV-2 transmission from COVID-19 infected mothers^[11]. The results indicate that there is no actual association between infections with COVID-19 and *Toxoplasma* to kill the fetus in its mother's womb. The report was in a harmony with (Muldoon KM, *et al*, 2020) who showed no evidence of neonatal infection observation among

the 14 neonates who had virologic assessments performed in the different case series reported in their literature^[1]. Also results found that there is no association with CMV in association with COVID-19 infections, and these results did not match with (D'Ardes D, *et al*, 2020) who reported that there are common infections for the results obtained between injuries with COVID-19 and CMV^[12]. Their study indicated that there is no actual participation between those infected with Covid 19 among pregnant women and between toxoplasmosis and toxoplasmosis, as well as CMV in order that the fetus be killed inside the mother's womb and no trans-placental transmission of SARS-CoV-2 from COVID-19 infected mothers. These findings agreed with (Algarroba, G. N. *et al*, 2020) who found that the neonatal viremia took place after placental infections, and these results were also consistent with a case study on the existence of virion in placental tissues, although this study has reported neither placental inflammations nor fetal/neonatal infections^[13].

Conclusion:

In the current research, the age group (20-29) years exhibited a higher prevalence of COVID-19 than other age groups. The COVID-19 infections in the urban and rural areas were common than other infections. However, no association between CMV and COVID-19 infections can be investigated, thus this study indicated that no actual participation between those infected with Covid-19 among pregnant women and toxoplasmosis as well as CMV resulted in fetus killing inside the mother's womb.

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Conflict of Interest: None.

Source of Findings: self-findings.

Ethical Clearance: None.

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