# Prevalence of Antibodies to Cytomegalovirus, Rubella Virus and Toxoplasma gondii among aborted women in Thiqar province

**Assistance instructor**
**Nuha Jaboory Hadi**
**Thiqar University**
**Sciences College –Biology department**

## *Abstract*

Current study was performed among aborted women whom referred by specialist doctor to Al-Hussein's didactical hospital unite of hormones and immunological tests to perform necessary tests, 190 serum samples were collected to detecting antibodies type IgM and IgG for T*oxoplasma gondii* , *Cytomegalovirus* and *Rubella virus* by utilize mini VIDAS technique .

Present study showed 95(50%) were positive out of there 40(42.10%) for IgM , 38(40%) were IgG positive and 17(18%) were positive for each antibodies ,the higher value for IgM was *Toxoplasma gondii* 16(40%) and the lower value 4(10%) was in *Rubella virus*, IgG recorded high percentage 23(60%) was in *Cytomegalovirus* and lower percentage was in *Rubella virus* 2(5%) such as our study recorded Positive prevalence 8(47%) for IgM and IgG combination for *Toxoplasma gondii* and *Cytomegalovirus* and the lower value 4(24%) was in *Toxoplasma gondii* and didn't recorded any positive case for each antibodies to *Rubella virus*.

## *Preface*

Maternal infections play a critical role in pregnancy wastage and their occurrence in patients with Bad Obstetric History (BOH) is a significant factor [(1)]. The rate of spontaneous abortion from foetal infection by the infectious agents like TORCH (*Toxoplasma gondii , Rubella virus, Cytomegalovirus* and *Herpes Simplex virus)* group and others such as *Treponemoa pallidum* is believed to range from 10 -15 %[(2)]. Congenital intrauterine infections have been associated with congenital abnormalities, intrauterine growth retardation and intrauterine death of the fetus, as well as late sequelae such as developmental delay, blindness and deafness of the infected child [(3)].

The placenta and the fetus can be infected either by transplacental transmission or by an ascending infection from the

vagina. The proportion of abortion associated with infections has been reported to be 6-15% of all cases in different studies [4][5].

Consideration of the timing of the miscarriage is important, as different causes of miscarriage tend to manifest at different periods of gestation. In first trimester miscarriages, important causes include chromosomal abnormalities, which occur in about 70% of the cases[6] maternal diseases, including poorly-controlled diabetes mellitus[7],uncontrolled thyroid disease[8], severe systemic lupus erythematosus[9] and antiphospholipid syndrome[10]poor maternal lifestyle habits (including alcohol consumption, smoking and use of illicit drugs); and exposure to non-steroidal anti-inflammatory drugs around the time of conception[11] Second trimester miscarriages, on the other hand, are more commonly caused by specific types of congenital uterine anomalies[12].
cervical incompetence[13] maternal infections[14] maternal thrombophilic states, such as inherited thrombophilias[15] and antiphospholipid syndrome[16] and also chromosomal abnormalities which account for up to 20% of foetal losses during this period[6].

Maternal-fetal transmission of Toxoplasmosis is dependent on the time of maternal infection. The earlier the fetus acquires the infection the more severe the consequences, however maternal-fetal transmission is more likely to occur later in pregnancy. Disseminated *Toxoplasma* may cause fetal death [17].

*Rubella* is associated with a wide variety of fetal abnormalities and also infects the placenta, enhancing the risk of stillbirth [18][19]. However due to widespread vaccination, congenital rubella infection in developed countries is extremely rare, whether CMV actually causes stillbirth and, if so, the mechanism by which it does so is not clear [17]. However, a prospective study of more than 10,000 women found an increase in fetal loss associated with infection in early pregnancy [20].

***Aim of present study was***: Topic of prevalence antibodies for acute and chronic infection for more causes of abortion spreading that is including *Toxoplasma gondii ,Cytomegalovirus* and *Rubella virus* with utilizing (mini VIDAS) technique.

## *Materials and Methods*

***Study group:-***

The study was conducted on two groups the first Study group were included 190 blood samples taken from aborted females whom referred to Al-Hussein's didactical hospital unit of hormones and immunological tests to detect cause of abortion as a one of many tests ,the second group Control group were included 20 blood samples taken from normal females, age range was 18-40 years.

## ***Samples:-***

Blood samples were separated and stored at (-20 $C^0$) until analysis, all serum samples were screened for the presence IgM and IgG antibodies against *Toxoplasma gondii ,Cytomegalovirus* and *Rubella virus* by using (mini VIDAS kits : **V**itek **I**mmuno **D**iagnostic **A**ssay **S**ystem ) for Biomerieux company).The tests were performed according to manufactures instruction by added 200 µl of serum to sample well in test strip and the instrument worked automatic , all the samples were showing optical density above cut off value considered positive.

## ***Statistical analysis:-***

In current ours study we used statistical program SPSS version (17.0) to study the significance between tests in each type of antibody IgM and IgG, we used (***t – test***) after detection normal distribution to the data and appropriate $P < 0.05$ consider significant [21].

## ***Results***

### ***Seropositive of IgM alone and in combination.***

In the study group 95 serum samples were positive for both antibodies IgM and IgG with percentage was 95 (50%) from the total 190 examined samples, the higher prevalence in IgM alone was in *Toxoplasma* 16(40%) and the minimal was *Rubella virus* 4(10%) additionally, prevalence of IgM combination was higher in *Toxoplasma* and *Cytomegalovirus* 6(15%) and the lower value was in the other 2(5%). IgM alone and combination recorded total percentage was 40(42.10%), the statistical analysis showed significant difference $P < 0.05$ within alone and combination prevalence table (1).

*Table(1) Seropositive of IgM to Toxoplasma , Cytomegalovirus and Rubella virus alone and in combination.*

| Test | Positive | Percentage % | P.value |
|---|---|---|---|
| *Toxoplasma gondii* IgM alone | 16 | 40 | P= 0.031 |
| *CMV* IgM alone | 10 | 25 | |
| *Rubella* IgM alone | 4 | 10 | |
| *Toxoplasma gondii* IgM + *CMV* IgM | 6 | 15 | |
| *Toxoplasma gondii* IgM+ *Rubella* IgM | 2 | 5 | |
| *CMV* IgM + *Rubella* IgM | 2 | 5 | |
| **Total** | **40** | **100** | |
| | **42.10%** | | |

***Seropositive of IgG alone and in combination.***

While Seroprevalence of IgG alone was higher 23(60%) in *cytomegalovirus* and lower in *Rubella virus* 2(5%) as well as IgG combination prevalence was one value between *Toxoplasma* and *cytomegalovirus* 9(24%) and didn't record result in *Rubella virus* with the other, total percentage was 38(40%) with no significant difference within IgG alone and combination P> 0.05 table (2).

**Table (2) Seropositive of IgG to Toxoplasma, Cytomegalovirus and Rubella virus alone and in combination.**

| Test | Positive | Percentage % | P. value |
|---|---|---|---|
| *Toxoplasma gondii* IgG alone | 4 | 11 | P=0.138 |
| *CMV* IgG alone | 23 | 60 | |
| *Rubella* IgG alone | 2 | 5 | |
| *Toxoplasma gondii* IgG + CMV IgG | 9 | 24 | |
| **Total** | **38** | **100** | |
| | **40%** | | |

***Seropositive of IgM and IgG in combination.***

Seroprevalence of IgG in combination with IgM was 17(18%) out of total 190 samples examined the higher value was 8(47%) in *Toxoplasma* and *cytomegalovirus* and the lowest was 4(24%) in *Toxoplasma* alone and we didn't record combination

prevalence in *Rubella virus*, the statistical analysis showed significance difference P< 0.05 table (3).

**Table (3) Seropositive of IgM and IgG to Toxoplasma, Cytomegalovirus in combination.**

| Test | Positive | Percentage % | P.value |
|---|---|---|---|
| *Toxoplasma gondii* IgM+ CMV IgG | 8 | 47 | P=0.041 |
| *CMV* IgM + *CMV* IgG | 5 | 29 | |
| *Toxoplasma gondii* IgM+IgG | 4 | 24 | |
| **Total** | **17** | **100** | |
| | **18 %** | | |

## ***Discussion***

*Toxoplasma gondii*, *Rubella* and *CMV* are still more problems that cause abortion, still birth, premature delivery and congenital malformation in ours

province Congenital transmission of toxoplasmosis is known to occur during acute phase of maternal infection. In the resent study *Toxoplasma* IgM antibody were found in 16(40%) of IgM alone and combination while *CMV* and *Rubella* were 10(25%), 4(10%) respectively this results were asymptotic to Shashi et al[22] who recorded Seroprevalence to *Toxoplasma* IgM (42.5%) ,*Rubella* (17.5%) and CMV (29.5%), and with Yasodhara et al[23] when his results showed IgM to *Rubella* (6.5%) and *CMV* (5.8%) whereas, Kishore et al [24] and Turbadkar et al [25] reported *Rubella* IgM antibodies positivity as (10.38%).

Rajendra et al [26] recorded results were (27.27%) to *Toxoplasma* (4.33%) to *Rubella* and (5.66%) to CMV while other workers report seropositivity ranging from (4%) to (17.77%) [27-28] to *Rubella* and ranges from (3%) to (12.9%) [29] to CMV, and in United Arabic Emirates Nishi [30] IgG results to *Toxoplasma* were in range (24.20% – 30.6 %) and Al-Adlaan [31] his results showed IgM 38(33.33%) and IgG 54(47.37%) for *Toxoplasma gondii*.These results were similar in Seroprevalence of viruses and difference in parasitic infection and difference with Turbadkar et al [25] when

recorded IgG for (26.8%) for *Toxoplasma gondii* (8.42%) for *Rubella* and (33.58%) for *CMV* .

The reason of similar and different refer to the regional variations in the incidence of *Toxoplasma gondii* rates from one to another country or even within the same country. This variation has been attributed to clime, culture differences regarded hygienic and feeding habits by washing the vegetable very well and avoid eating the raw meat the results differ from one to another person may be according to the workers experience to detection the best results and avoid the cross reaction that may be give a false positive or negative results so this difference bring about vacillation the workers results in different studies.

## ***Conclusion***

The present study demonstrates a strong association between the infectious agents (*Toxoplasma gondii*, *Rubella* and *CMV*) and abortion in women. It is therefore recommended that all antenatal cases with such history should be routinely screened for these agents (IgM and IgG). Early diagnosis will help in proper management of the cases. This study also emphasizes the need for immunization in prospective mothers and adolescent girls who have not received vaccine in their childhood that give there acquired immunity to prevent infection that will reducing chance of abortion.

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انتشار الأضداد المناعية للفيروس المضخم للخلايا و فيروس الحصبة الألمانية ولطفيلي المقوسة الكونيدية لدى النساء المجهضات في محافظة ذي قار

**م.م:نـهى جبوري هادي**
**جامعة ذي قار**
**كلية العلوم - قسم علوم الحياة**

**الخلاصة**

أجريت الدراسة الحالية على النساء المجهضات و المحالات من قبل الطبيب المختص إلى مستشفى الحسين التعليمي وحدة الهرمونات و الفحوصات المناعية لغرض إجراء الفحوصات اللازمة , تم جمع 190 عينة مصل للكشف عن الأجسام المضادة IgM و IgG لكل من طفيلي المقوسة الكونيدية *Toxoplasma gondii* و الفيروس المضخم للخلايا *Cytomegalovirus* وفيروس الحصبة الألمانية *Rubella virus* باستعمال تقنية. (mini VIDAS kits : **V**itek **I**mmuno **D**iagnostic **A**ssay **S**ystem)

سجلت الدراسة 95 (50%) عينة موجبة كان منها 40 (42.10%) للضد المناعي IgM و 38 (40%) للضد المناعي IgG و 17 (18%) لكلا الضدين حيث كانت أعلى نسبة إصابة للضد IgM في طفيلي المقوسة الكونيدية 16 (40%) واقل نسبة إصابة 4(10%) لفيروس الحصبة الألمانية أما بالنسبة للضد المناعي IgG فقد سجل أعلاها للفيروس المضخم للخلايا 23(60%) واقلها لفيروس الحصبة الألمانية 2(5%), كما سجلت أعلى نسب الإصابة 8(47%) للضدين سوية IgM + IgG لطفيلي المقوسة الكونيدية و للفيروس المضخم للخلايا واقلها 4(24%) لطفيلي المقوسة الكونيدية ولم يتم تسجيل إي إصابة لكلا الضدين بالنسبة إلى فيروس الحصبة الألمانية.