Cytomegalovirus seroprevalence in women with bad obstetric history in Kirkuk, Iraq

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Summary The human cytomegalovirus (CMV) is a major cause of congenital infections. A case—control descriptive study was conducted in Kirkuk, Iraq to determine the seroprevalence of CMV in women with bad obstetric history (BOH) compared to women with a normal previous pregnancy. The CMV IgG and IgM seroprevalence was higher in women with BOH. The CMV IgG seroprevalence was significantly influenced by pregnancy, age, residence and level of education. In addition, the current CMV infection was significantly associated with pregnancy, age, residence and education. Large families (crowding index >3) exhibited higher seroprevalence for CMV IgM (8.3%) and IgG (98.3%), but odd ratio (OR) showed no significant association between family size and seropositivity. The CMV IgG seropositivity was higher in working women (100%) compared to housewives (95.4%). However, the CMV IgM (current infection) was 6.8% in housewives and was not detected in any working women (0%). The OR exhibited no significant association between occupation and both IgM and IgG levels.
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Introduction

The human cytomegalovirus (HCMV) is a major cause of congenital infections. This virus's clinical manifestations range from asymptomatic forms (90% of cases) to severe fetal damage and, in rare cases, death due to abortion [1].

Cytomegalovirus (CMV) infection during pregnancy is far more complex than other infections because the virus can frequently be reactivated during the child-bearing years and can be transmitted to the fetus despite maternal immunity [2].

There are many confounding studies describing the association between CMV infection and pregnancy loss, which show that HCMV can result in abortion or stillbirth [3,4]. HCMV acts as an immune modulator by using an array of immune evasion strategies to avoid elimination from the host, and its viral proteins are involved in the regulation of cellular gene expression and the induction of pro-inflammatory cytokines [5] or an autoimmune response [6]. In another study in Waset province, Iraq [7], women with a history of abortion showed 60.2% IgM seropositivity; however, this not significantly different from the control. A high percentage of repeated abortions (two and three or more) occurred in women seropositive for CMV IgM.

In Mosul, Iraq [8], 12% of women of child-bearing age were seropositive for cytomegalovirus (CMV); therefore, the majority cases of congenital CMV infection are likely a result of maternal reinfection. In Baghdad city, Iraq, IgM antibodies significantly correlate with a history of abortion [9]. In another study of women with habitual abortions in the Thi Qar Governorate, Iraq, 60 of 60 women (100%) had antibodies against CMV, with 9 women (15%) with IgM antibodies, 21 women (35%) with IgG antibodies and 30 women (50%) with both IgM and IgG antibodies [10].

Cytomegalovirus is frequently a causative agent of prenatal and perinatal infection and may lead to pregnancy complications [11]. The seropositivity of CMV varies widely worldwide [12]. A review of 40 global studies on CMV seroepidemiology indicated a range of seropositivity, from 30.4% in Ireland [13] to 98.9% in Turkey [14] in pregnant and/or child-bearing age women. In addition, the seroprevalence rate ranged from 14.2% in Iran [15] to 91.05% in India [16] in women with a bad obstetric history.

In Arab countries, we reviewed 21 studies, which indicated a seroprevalence rate ranging from 77.8% in Babylon, Iraq [17] to 88% in Jordan [18] in pregnant women. The seroprevalence ranged from 4.8% in Baghdad, Iraq [19] to 95% in Jordan [18] in women with a bad obstetric history.

The objective of the present study is to determine the seroprevalence of CMV in women with a bad obstetric history and the sociodemographic characteristics that may influence seropositivity.

Patients and methods

Setting

Kirkuk General Hospital, Primary Health Care Centers in Kirkuk Governorate.

Study design

This study is a descriptive case—control study.

Study area

This descriptive case—control study was conducted at the antenatal clinic of the Kirkuk General Hospital and Primary Health Care Centre in Tessean. Women (pregnant or not pregnant) with a bad obstetric history were recruited from the outpatient Gynaecology Clinic Kirkuk General Hospital or the outpatient Clinic at Tessean PHC.

Study population

The study population comprises women of child-bearing age. The study population was recruited from the Primary Healthcare Centers located in urban and rural areas in Kirkuk Governorates. In addition, one study population group was recruited from pregnant women in labor to obtain the group of pregnant women with risky outcomes.

Group 1: Pregnant women aged 15—48 years with normal pregnancy.
Group 2: Non-pregnant women aged 15—48 years with normal pregnancy.
Group 3: Pregnant women with BOH depending on their previous pregnancy and/or delivery outcome, which includes pregnancy loss, intrauterine deaths, preterm deliveries and intrauterine growth retardation. Their ages ranged from 15 to 48 years.
Group 4: Non-pregnant women with BOH depending on their previous pregnancy and/or delivery outcome, which includes pregnancy loss, intrauterine deaths, preterm deliveries and intrauterine growth retardation. Their ages ranged from 15 to 48 years.

The demographic information of these groups is shown in Table 1. The target number recruited for each group was 150 women. However, the total number of women included in the study was 538, of which 293 (54.5%) had BOH and 245 (45.5%) had a normal pregnancy history. In the BOH group, 144 (49.1%) women were pregnant, whereas in the