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INPLASY

Cytomegalovirus among Pregnant Women and Neonates in the Gulf Cooperation Council (GCC) Region: A Systematic Review

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Alshengeti, A.

Corresponding author:
Amer Alshengeti

aalshengeti@dal.ca

Author Affiliation:
Department of Pediatric, College of Medicine, Taibah University.

ADMINISTRATIVE INFORMATION

Support - No support.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 July 2026 and was last updated on 15 July 2026.

INTRODUCTION

Review question / Objective (1) To assess the seroprevalence of Cytomegalovirus (CMV) infection among pregnant women in the Gulf Cooperation Council (GCC) region, comprising Saudi Arabia, Kuwait, the United Arab Emirates (UAE), Qatar, Oman, and Bahrain
(2) To determine the incidence and clinical characteristics of congenital CMV infection among neonates in the GCC region.

Condition being studied 1. seroprevalence of Cytomegalovirus (CMV) infection among pregnant women in the Gulf Cooperation Council (GCC)
2. Incidence and clinical characteristics of congenital CMV infection among neonates in the GCC region.

METHODS

Search strategy A systematic search was conducted in the following databases from January 1980 to March 2026: PubMed/MEDLINE (1946 onwards), MEDLINE Ovid (including In-Process and Other Non-Indexed Citations), Scopus, Web of Science, and Google Scholar. The search combined terms related to the exposure (cytomegalovirus, CMV, HCMV, human herpesvirus 5, HHV-5), the populations of interest (pregnant women, pregnancy, maternal, antenatal, neonate, newborn, infant, congenital, cCMV), and the geographic setting (Saudi Arabia, KSA, Kuwait, United Arab Emirates, UAE, Emirates, Qatar, Oman, Bahrain, Gulf, GCC, Arabian Gulf, Persian Gulf). Reference lists of included studies and prior systematic reviews were hand-searched to identify additional eligible studies.

Participant or population Eligible populations were (1) pregnant women and (2) neonates and infants, in whom sampling was performed in a GCC country (Saudi Arabia, Kuwait, UAE, Qatar, Oman, or Bahrain). Studies performed on non-Saudi/non-GCC populations sampled within GCC laboratories were included if the women had resided in the GCC during pregnancy.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Obesrvational studies: Cross sectional, Prospective cohort, Retrospective Case control, Case series, Case reports.

Eligibility criteria Eligibility Criteria
Population and Setting:
Eligible populations were (1) pregnant women and (2) neonates and infants, in whom sampling was performed in a GCC country (Saudi Arabia, Kuwait, UAE, Qatar, Oman, or Bahrain). Studies performed on non-Saudi/non-GCC populations sampled within GCC laboratories were included if the women had resided in the GCC during pregnancy.

Inclusion Criteria — Pregnant Women
Studies were eligible if they reported CMV-specific IgG and/or IgM serology in pregnant women during pregnancy. Studies reporting the gestational age or trimester of sampling were preferred. Studies reporting CMV IgG avidity or maternal CMV DNA (blood, urine, amniotic fluid) were also eligible.

Inclusion Criteria — Congenital CMV
Studies were eligible if they reported confirmed congenital CMV infection diagnosed by a positive CMV PCR on urine, saliva, blood, or cerebrospinal fluid obtained within the first 21 days (3 weeks) of life. Studies reporting the clinical presentation (symptomatic vs. asymptomatic; specific clinical features) were preferred. Eligible designs included case reports, case series, prospective cohort, and retrospective cohort studies.

Exclusion Criteria
Studies were excluded if: (1) they did not report CMV as a primary or secondary outcome; (2) they reported CMV data for non-pregnant women or non-neonatal populations only (e.g., blood donors, transplant recipients, general adult populations) without separately extractable data for pregnant women or neonates; (3) they were review articles, commentaries, editorials, or conference abstracts without extractable primary data; (4) the study was conducted entirely outside the GCC region; or (5) the article was not published in English or did not have an extractable English-language abstract.

Information sources A systematic search was conducted in the following databases from January 1980 to March 2026: PubMed/MEDLINE (1946 onwards), MEDLINE Ovid (including In-Process and Other Non-Indexed Citations), Scopus, Web of Science, and Google Scholar.

Main outcome(s) (1) Seroprevalence of Cytomegalovirus (CMV) infection among pregnant women in the Gulf Cooperation Council (GCC) region, comprising Saudi Arabia, Kuwait, the United Arab Emirates (UAE), Qatar, Oman, and Bahrain
(2) The incidence and clinical characteristics of congenital CMV infection among neonates in the GCC region.

Data management A standardized data extraction form was used to collect: first author, year of publication, country and region, study design, sampling period, sample size, participant characteristics, specimen type(s), laboratory method(s) (ELISA, chemiluminescence immunoassay, PCR, avidity assay), CMV IgG prevalence, CMV IgM prevalence, PCR positivity, clinical presentation (where reported), and main conclusions. Extraction was performed in duplicate and discrepancies resolved by consensus. Studies that simultaneously reported on both pregnant women and neonates contributed data to both extraction tables (Part A — maternal serology; Part B — congenital/neonatal CMV) and were counted once towards the total number of included studies.

Quality assessment / Risk of bias analysis The methodological quality of observational studies included was appraised using the Newcastle-Ottawa Scale (NOS) — the cross-sectional modified version for prevalence studies, and the cohort version for longitudinal studies [21]. Each study was rated on domains covering selection, comparability, and outcome/exposure ascertainment. Case reports were not formally scored but were summarized narratively.

Strategy of data synthesis Given the heterogeneity in study populations, laboratory methods, and reporting formats, results are synthesized narratively. Quantitative pooling (meta-analysis) was not conducted because of the small number of eligible studies per country and the methodological heterogeneity in sampling (vaginal, cord blood, maternal urine) and assay platforms. Maternal seroprevalence is reported as the proportion of women with positive IgG or IgM antibody. Congenital CMV incidence, where reported, is expressed per 1,000 live births.

Subgroup analysis Not applicable.

Sensitivity analysis Not applicable.

Country(ies) involved Saudi Arabia/ College of Medicine, Taibah University.

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Keywords Cytomegalovirus; congenital CMV; pregnant women; neonates; Saudi Arabia; Gulf Cooperation Council; MENA; systematic review.

Contributions of each author

Author 1 - Amer Alshengeti.
Email: aalshengeti@dal.ca

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