25TH NATIONAL & 11TH INTERNATIONAL ANNUAL CONGRESS
ON RESEARCH AND TECHNOLOGY OF IRANIAN MEDICAL SCIENCES STUDENTS
URMIA UNIVERSITY OF MEDICAL SCIENCES, URMIA, IRAN

Association of Cytomegalovirus with Male Infertility: A Systematic Review

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ABSTRACT

Introduction: Infertility refers to the condition in which clinical pregnancy does not occur after 12 months of regular unprotected sex. Infertility affects approximately 20% of couples of reproductive ages. The cause of infertility in couples could be attributed to the malefactor in about 40-50% of cases, which is often associated with genital infections and genitourinary tract inflammation. Some viral infections can be considered a potential cause of infertility. Human cytomegalovirus (HCMV) is an infection that affects the male reproductive tract and has been linked to male infertility. Cytomegalovirus is a double-stranded DNA virus and a member of the herpesviridae family and betaherpesvirine subfamily, also called HHV5. Different effects of male infertility can be acute or chronic. Because there is conflicting evidence regarding the association between cytomegalovirus and male infertility, in our review article, we focused on the association between cytomegalovirus and male infertility.

Search Strategy: This study was based on PRISMA guidelines. To conduct this review, we conducted a comprehensive search in relevant databases including PubMed, SCOPUS, and Google Scholar with keywords "cytomegalovirus", "infertility", "male infertility not female", "sperm", and "polymerase chain reaction" from 2010 to 2023. There were no language restrictions, and studies investigating the presence of cytomegalovirus DNA or immunoglobulins in male infertility were included.

Results: Based on the entry and exclusion criteria, 400 articles were first identified, most related to our chosen title, by removing systematic, narrative, press review articles, conference abstracts, and theses. All 16 articles were clinical trials, and different PCR, immunohistochemistry, and ELISA methods were used to detect the effect of cytomegalovirus on male infertility in blood and semen samples. Among these studies, six cases reported a positive relationship between cytomegalovirus and male infertility. They claimed that HCMV directly affects spermatogenesis, while 10 cases found no significant relationship.

Conclusion and Discussion: Based on our findings, cytomegalovirus appears to play a role in male infertility by infecting the peripheral gonads, which directly affects spermatogenesis. This behavior can lead to sperm dysfunction, inflammatory changes in the composition of genital secretions, epididymal inflammation, oligospermia, and asthenozoospermia. Additionally, it may induce an immune response, producing anti-sperm antibodies. However, some studies dispute this relationship, possibly due to methodological differences, sample type, or sample size. Therefore, more extensive research is needed to confirm these findings.

Citation:
Tahmasebizadeh M, Akrami Z, Shahabi Aghdam S, Shirin Zadeh T, Mashkani A. Association of Cytomegalovirus with Male Infertility: A Systematic Review. *Iranian biomedical journal* 2024; 28(7): 118.

Keywords: Cytomegalovirus, Infertility, Polymerase chain reaction