

Article

Study of prevalence of cytomegalovirus in male partner of infertile couple and its impact on seminal analysis in a tertiary care hospital of Kolkata

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Abstract: Introduction: Cytomegalovirus (CMV), a double-stranded DNA virus belongs to a family called herpesviridae or human herpesviruses (HHVs). CMV is spread by direct contact with infectious body fluids such as nasal secretions, saliva, tears, urine, genital secretion or breast milk. After contamination, the virus initially replicates in the epithelial cells at the site of entry, followed by hematogenous spread to numerous organs and cell types.

Aims: to estimate prevalence of CMV in a population of male partners of infertile couples attending a tertiary care hospital of Kolkata and also to determine the impact of CMV infection on sperm parameters.

Materials and method: The proposed study is an observational and descriptive study of cross-sectional study was conducted in department of Physiology, R.G. Kar Medical College & Hospital, Kolkata. The study period was One year January 2021 - January 2022. 56 patients were included in this study.

Result: We showed that, lower number of patients had Normal Morphology in with Cytomegalovirus [4 (100.0%)] this was not statistically significant ($p=0.6895$). Association of Addiction with Cytomegalovirus was statistically significant ($p=0.0059$) and Infertility DX with Cytomegalovirus was not statistically significant ($p=0.6088$). It was found that, higher number of patients had Height in without Needed Mechanical Ventilation [29 (65.9%)] compared to with Needed Mechanical Ventilation [4 (44.4%)] It was not statistically significant ($p=0.0504$).

Conclusion: we concluded that cytomegalovirus was associated with in male partner of infertile couple and its impact on seminal analysis a tertiary care hospital.

Keywords: Cytomegalovirus (CMV);, Infertile couples; Sperm parameters.

1. Introduction

Cytomegalovirus (CMV), a double-stranded DNA virus belongs to a family called herpesviridae or human herpesviruses (HHVs) [1,2]. CMV is spread by direct contact with infectious body fluids such as nasal secretions, saliva, tears, urine, genital secretion or breast milk [3]. After contamination, the virus initially replicates in the epithelial cells at the site of entry, followed by hematogenous spread to numerous organs and cell types. CMV persists life-long in infected individuals, with the genome detected in stem cells, myeloid precursor cells and monocytes [4].

CMV contamination rate is higher among children and young adults. Moreover, among males, this rate increases by the age. Other risk factors in adolescent males include the ethnicity (African Americans more than other races), some risky personal behaviors and living in either group living or crowded situations [5].

Infertility is defined as the inability to conceive a child after one year of unprotected intercourse. Approximately 15% of couples of reproductive age worldwide suffer from infertility and male factors account for half of them. In Iran, the prevalence of infertility is estimated to be 10.9% and male factor infertility accounts for 34% of all cases [6].

Genital tract infections in human are proven to be one of causes of infertility. Sexually transmitted diseases (STDs) in men cause genital injury, infections of semen, prostatitis, urethritis, epididymitis and orchitis [7].

Viral infections of male genital tract have been investigated for years as possible causes of male infertility. There are several mechanisms by which viruses might influence male infertility including direct effect on spermatogenesis resulting in sperm dysfunction, inflammatory changes in the composition of genital secretions and induction of immune response by production of anti-sperm antibodies [8].

In the literature, there are some discrepancies among studies showing the relationship between HHV infections (Including CMV, herpes simplex virus (HSV) and Epstein-Barr virus (EBV)) and sperm parameters or male infertility, with some studies confirming these relationship and some studies rejecting the same. For instance, in one of the studies with the impact of HHV infections on sperm parameters, it has been shown that the DNA of STD pathogens in semen were associated with reduced sperm count and motility [9].

A. Justification & relevance of proposed research work

Cytomegalovirus (CMV), a double-stranded DNA virus belongs to a family called herpes viridae or human herpes viruses (HHVs). CMV is spread by direct contact with infectious body fluids such as nasal secretions, saliva, tears, urine, genital secretion or breast milk. After contamination, the virus initially replicates in the epithelial cells at the site of entry, followed by hematogenous spread to numerous organs and cell types. CMV persists life-long in infected individuals, with the genome detected in stem cells, myeloid precursor cells and monocytes. CMV contamination rate is higher among children and young adults. Moreover, among males, this rate increases by the age. Other risk factors in adolescent males include the ethnicity (African Americans more than other races), some risky personal behaviors and living in either group living or crowded situations.

2. Materials and methods

Study site: Department of Gynaecology & Obstetrics, R.G. Kar Medical College & Hospital, Kolkata.

Study design: The proposed study is an observational and descriptive study of cross-sectional design.

Period of study: One year January 2021 - January 2022

2.1. Inclusion Criteria

1. Male subjects of the infertile couples at the Out-Patient Department of Gynecology & Obstetrics, R.G. Kar Medical College & Hospital, Kolkata.
2. Subjects in the age group of 21 > years.

2.2. Exclusion Criteria

1. Subjects unwilling to undergo the tests.
2. Subjects who have congenital defects (eg. undescended testis)
3. Subjects who have been diagnosed of venereal diseases or any form of active orchitis.
4. Subjects who have urological/ post-surgical complications.

3. Result and discussion

The proposed study is an observational and descriptive study of cross-sectional study was conducted in department of Physiology, R.G. Kar Medical College & Hospital, Kolkata. The study period was One year January 2021 - January 2022. 56 patients were included in this study.

Stadler LP *et al.*, [10] (2013) found that congenital cytomegalovirus (CMV) is a leading cause of disability, including sensorineural hearing loss, developmental delay, and mental retardation, additional questions were asked about feeding and changing diapers, and for those > 14 years of age (n = 1162). By age 12, evidence of CMV infection was common. Multiple factors regarding race and personal behaviors likely contribute to seroconversion earlier in life.

In our study, out of 56 patients most of the patients were 21-30 years old [33 (58.9%)]. but this was not statistically significant (0.7064). The mean age was slightly higher in with Cytomegalovirus [30.7500±7.4106] compare to without Cytomegalovirus [29.5962±5.8150] but this was not statistically significant (p=0.7084).

Jahromi BN *et al.*, [11] (2020) observed that genital tract infection is one of the causes of male infertility. Normal sperm morphology was 2.73±2.83% and 5.99±5.44% in CMV positive and negative

groups, respectively ($p < 0.001$). We showed that, lower number of patients had Normal Morphology in with Cytomegalovirus [4 (100.0%)] this was not statistically significant ($p = 0.6895$). Association of Addiction with Cytomegalovirus was statistically significant ($p = 0.0059$) and Infertility DX with Cytomegalovirus was not statistically significant ($p = 0.6088$).

It was found that, higher number of patients had Height in without Needed Mechanical Ventilation [29 (65.9%)] compared to with Needed Mechanical Ventilation [4 (44.4%)] It was not statistically significant ($p = 0.0504$). Our study showed that, mean Height higher in with Cytomegalovirus [167.5000 ± 3.1091] compared to without Cytomegalovirus [1.2866 ± 3.7951] but It was not statistically significant ($p = 0.2666$).

Our study showed that, mean Weight higher in with Cytomegalovirus [167.5000 ± 3.1091] compared to without Cytomegalovirus [1.2866 ± 3.7951] It was not statistically significant ($p = 0.5216$).

Our study showed that, BMI ($p = 0.5216$), Volume ($p = 0.4332$), pH ($p = 0.2981$), LiQ Time ($p = 0.5215$), SC ($p = 0.8955$), TM ($p = 0.8053$), RP ($p = 0.9685$), NP ($p = 0.5083$), IM ($p = 0.6689$),

RC ($p = 0.2847$) It was not statistically significant.

4. Conclusion

- In our study, out of 56 patients most of the patients were 21-30 years old. but this was not statistically significant. The mean age was slightly higher in with Cytomegalovirus compare to without Cytomegalovirus but this was not statistically significant.
- We showed that, lower number of patients had Normal Morphology in with Cytomegalovirus this was not statistically significant.
- Association of Addiction with Cytomegalovirus was statistically significant and Infertility DX with Cytomegalovirus was not statistically significant.
- It was found that, higher number of patients had Height in without Needed Mechanical Ventilation compared to with Needed Mechanical Ventilation It was not statistically significant.
- Our study showed that, mean Height higher in with Cytomegalovirus compared to without Cytomegalovirus but It was not statistically significant.
- Our study showed that, mean Weight higher in with Cytomegalovirus compared to without Cytomegalovirus It was not statistically significant.
- Our study showed that, BMI, Volume, pH, LiQ Time, SC, TM, RP, NP, IM, RC It was not statistically significant.
- We concluded that cytomegalovirus was associated with in male partner of infertile couple and its impact on seminal analysis a tertiary care hospital.

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Table 1. Distribution of Infertility Dx and Morphology

		Frequency	Percent
Infertility DX	ASS	10	17.9%
	AZS	1	1.8%
	LCS	3	5.4%
	NZS	25	44.6%
	OAS	9	16.1%
	OATS	2	3.6%
	OZS	6	10.7%
	Total	56	100.0%
Morphology	Abnormal	2	3.6%
	Normal	54	96.4%
	Total	56	100.0%



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