

Citation: Nedal A Mergani, Marwa M. Ahmed, Wafa A Abd Alrheem, Elamin M. Ibrahim. Impact of Herpes Simplex Virus Type 2 on Sperm Concentration and Sperm Motility among Infertile Sudanese Males. African Journal of Medical Sciences, 2019, 4 (6). ajmsc.info

Impact of Herpes Simplex Virus Type 2 Antibodies on Sperm Concentration and Sperm Motility among Infertile Sudanese Males

Nedal A Mergani, Marwa M Ahmed,
Wafa A Abd Alrheem, Elamin M. Ibrahim
University of Khartoum, Khartoum, Sudan

Abstract

Background: Sexually transmitted infections (STIs) are of major concern to clinicians and researchers in the field of reproductive medicine. Many STIs pathogens can cause incurable and often fatal diseases, and have been transmitted through insemination procedures. The role of herpes simplex virus in male infertility has been investigated using sensitive methods.

Objective: To study the impact of herpes simplex virus (HSV) type 2 antibodies on sperm concentration and sperm motility among infertile Sudanese males.

Materials and methods: 45 serum specimens were collected from Sudanese infertile males and 45 serum specimens were collected from control cases. All study population were investigated for sperm analysis and for herpes simplex virus type 2 IgG and IgM antibodies using enzyme-linked immunosorbent assay (ELISA) technique.

Results: Semen analysis detected two groups of infertile males: males with normal sperm concentration and motility, and infertile males with abnormal sperm count and motility. HSV antibodies were detected in 9 (20%) of cases and in 7 (15.7%) of control cases. HSV IgG antibodies were as detected in 45 (100%) of cases and in 44 (97.8%) of control cases.

Conclusion: HSV type 2 antibodies had no objective impacts on sperm concentration or sperm motility among Sudanese infertile males.

Key words: Infertile Sudanese males, HSV type 2 antibodies, ELISA, Semen analysis.

Introduction

Herpes simplex virus (HSV) is a double-stranded, enveloped DNA virus, that is able to replicate in many types of cells. The HSV is responsible for a spectrum of diseases, ranging from gingivostomatitis to kerato-conjunctivitis, encephalitis, infections of newborns and some genital diseases. There are two types of HSV. Infection with HSV 1 and 2 differ in their clinical manifestations and severity. Type 1 is associated with oro-labial infection and type 2 primarily causes urogenital infection. After initial infection the virus will remain latent and may become

Mergani, et al., 2019: Vol 4 (6)

reactivated throughout the lifetime of the patient, especially in the immuno-compromised patients. The first infection leads to antibody formation. However, even in the presence of antibodies, reactivation still occurs, so that the presence of antibodies does not ensure protection against re-infection¹.

Infertility is a major problem of modern medicine, as it affects almost 20% of reproductive- aged couples. The cause of this the problem is attributed to the male partner in nearly 40%–50% of these cases. The most common disorder associated with male infertility is varicocele formation, which accounts for 35% of cases. Endocrine disorders, spermatic duct-obstruction, antisperm antibodies, gonado-toxins drugs, cryptorchidism, sexual dysfunction, and ejaculatory failure are less common causes, accounting for < 5% of male infertility cases².

In 50% of male infertility cases, the etiology remains unknown, and the infertility is classified as idiopathic. Idiopathic infertility represents a serious situation as it affects a high percentage of infertile men who cannot be successfully treated by the empirical therapeutic modalities currently applied. Human pathogens have been recognized as having a considerable possible effect on male factor infertility or low sperm counts in men. Bacterial infections may lead to male factor infertility with a prevalence of 6.6%–48%³.

Accumulating evidence indicates that viral infections contribute to male factor infertility, either directly through toxic effects on the cells of the male genital tract or indirectly, causing local infectious or immunological responses that can negatively affect reproductive functions⁴.

Oligozoospermia is two times more frequent in HSV-containing ejaculates than in HSV-negative ones. Thus symptomatic HSV infection has a negative effect on male fertility. HSV type 2 seroprevalence studies show variation in infection by geographic locations. Some of the highest prevalence rate of HSV type 2 have been found in Africa and America. Lower prevalence rates had been found in Western and Southern Europe compared to Northern Europe and North America. Although there had been few studies, lowest prevalence rate was seen in Asia⁵.

Many risk factors are linked to male infertility including tobacco smoking, alcohol consumption, drug addiction, overweight, gonorrhea infection, HIV, toxin exposure, testicle trauma, undescended testicles, congenital disorders, tumors, and chronic diseases⁶.

Materials and methods

This is a case-control study, conducted at the Fertility Center of Saad Abu Al Ola Hospital and Mohammed Al Hafez Fertility Center at Royal Care Hospital (Khartoum, Sudan). The study was conducted during the period from April 2018 to June 2018. Ninety specimens were collected: 45 specimens from infertile males with abnormal sperm count and motility (test group), and 45 specimens from infertile males with normal sperm count and motility (control group). Exclusion criteria included those males whose infertility was due to non-infectious causes. Informed consent was obtained from each patient for the purposes of the current study. None of the males studied or their spouses had reported any clinically confirmed genital herpetic infection in their past medical history.

Semenal fluid was collected by masturbation. The subjects were instructed on how to collect the specimens and to submit to the laboratory within one hour of production. The semen was collected after the patient had abstained from coitus for at least three days. The sperm density,

volume, viscosity, liquefaction time, percentage of actively motile sperms, percentage of abnormal forms, presence or absence of pus cells were assessed. Serum specimen was collected and tested by ELISA technique to estimate IgM and IgG herpes simplex virus type 2 antibodies. Data were analyzed using the Statistical Package for Social Science (SPSS) program, version 22.

Results

The test group patients were defined as having ≤ 20 million sperm count and $\leq 50\%$ sperm motility. While control group patients were defined as having ≥ 20 million sperm count and $\geq 50\%$ sperm motility.

HSV IgM antibodies were detected in 9 (20%) of test group patients and in 7 (15.7%) of control group patients. HSV IgG antibodies were detected in all (100%) test group patients and in 44 (97.8%) of control group patients. The prevalence rate of HSV IgG antibodies indicates remote infection, hence they are considered not diagnostic. The prevalence rate of HSV IgM antibodies indicates a recent infection.

As shown in Table (1), the correlation of HSV type 2 IgM antibodies with sperm count was found statically insignificant ($p = 0.379$); and the correlation of HSV type 2 IgM antibodies with sperm motility was also found statically insignificant ($p = 0.961$).

Table (1): Correlation of HSV type 2 IgM antibodies with sperm count and with sperm motility

Parameter	IgM result	No.	Mean	Standard deviation	p - value
Sperm count	Positive	9	6.867	8.3283	0.379
	Negative	36	18.211	37.7367	
Sperm motility	Positive	9	19.33	19.931	0.961
	Negative	36	19.67	17.604	

Discussion

HSV-2 mainly affects the genital tract and transmitted by sexual contact. The present study investigated HSV-2 antibodies by ELISA technique. The impact of HSV type 2 on sperm count and sperm motility among infertile males was studied.

HSV IgM antibodies were detected in 9 (20%) of test group cases; and in 7 (15.7%) of control group participants. HSV IgG antibodies were detected in all 45 (100%) of test group cases and in 44 (97.8%) of control group participants. The study revealed statistically insignificant correlation between test group cases and control group participants.

This study found different findings as compared with previous studies in literature which reported a statistically significant prevalence rate of HSV type 2 antibodies among infertile males; without conducting comparative control studies as performed in our study. In addition, to the variation in sample size and the study areas.

Conclusion: HSV type 2 antibodies had no objective impacts on sperm concentration or sperm motility among Sudanese infertile males.

Mergani, et al., 2019: Vol 4 (6)

Acknowledgements: Special thanks to all staff of Microbiology Department, Faculty of Medical Laboratory Sciences, University of Khartoum; and to all staff of the Fertility Center of Saad Abu Al Ola Hospital and Mohammed Al Hafez Fertility Center at Royal Care Hospital (Khartoum, Sudan).

References

1. Dawson C, Whitfield H. ABC of urology. Subfertility and male sexual dysfunction. *BMJ*.1996; 312 (7035): 902-5.
2. Greenberg SH, Lipshultz LI, Wein AJ. Experience with 425 subfertile male patients. *JUrol*. 1978;119 (4):507-10.
3. Skakkebaek NE, Giwercman A, de Kretser D. Pathogenesis and management of male infertility. *Lancet*. 1994; 343 (8911):1473-9.
4. Pallier C, Tebourbi L, Chopineau-Proust S, Schoevaert D, Nordmann P, Testart J, *et al*. Herpesvirus, cytomegalovirus, human sperm and assisted fertilization. *Hum Reprod*. 2002;17(5):1281-7.
5. Dejuçq N, Jegou B. Viruses in the mammalian male genital tract and their effects on the reproductive system. *Microbiol Mol Biol Rev*. 2001;65 (2): 208-31.
6. AG Abdulmedzhidova, LF Kurilo, LV Shileïko, NP Makarova, RR Klimova, AA Kushch, *Urologiia*, 2007 3,56-9

Mergani, et al., 2019: Vol 4 (6)