Seroinvestigation of Rubella virus of the oligozoospermia and azoospermia patients

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ABSTRACT

Background: The testis and epididymis are comparatively more relevant than accessory glands when it comes to inflammatory situations since they might become infected by microorganisms and become functionally compromised as a result.
Method: One hundred (serum+ semen) samples were taken from patients, Anti-RV IgG antibodies in serum were measured by using specific available ELISA kits, and the sperm samples were investigated to find oligozoospermia and azoospermia patients.
Result: The present study showed 26/90 (28.8%) were positive for anti-rubella IgG while 74/90 (82.2%) were negative according to the range of anti-rubella IgG levels. By using ELISA devices result also revealed that the anti-rubella IgG was positive in Azoospermia and Oligozoospermia patient by the percent (42.42%), (36.36%) respectively.
Conclusion: The study conducted that there is a direct relationship between rubella virus infection and infertility, testis infection by rubella may negatively impact spermatogenesis and increase the risk of infertility.

Keywords: Infertility, rubella virus, sperms, epididymitis

1. Introduction

The testis and epididymis can become inflamed due to microorganisms, and as a result, the male reproductive system can become effectively compromised, these inflammatory conditions are much more common than those affecting the accent glands, the male reproductive system can become infected by a variety of microorganisms, including bacteria, viruses, and protozoa, which can reduce male fertility (1). Additionally, the majority of those infections are sexually transmissible, microbial infections may also directly harm spermatozoons by their interaction with them (2).

Infection of the sperm by microorganism causing death, decreasing sperm memory, and decreasing motility in addition, microbial infections can indirectly affect sperm production and the characteristics of the genital organs by producing inflammatory cytokines which reduces male fertility (3).

In general, acute RNA virus infections have the potential to have more dramatic effects on sperm quality than persistent DNA virus infections. For instance, sperm memory, sperm motility, and other sperm characteristics are all impacted by ZIKV contamination in humans and equine arteritis virus (EAV) infection in horses (4). The rubella virus, a single-stranded RNA virus belonging to the Togaviridae family, is what causes the acute infectious viral disease known as German measles, which is only contagious among humans (5). Viral orchitis frequently causes testicular atrophy, but sterility is relatively uncommon because atrophy is typically unilateral. According to a research, 12 percent of 316 boys with

congenital rubella had cryptorchidism, which is thought to be caused by the rubella virus altering the development of specific parts of the reproductive system (6), the virus may also harm adult testicles; during a rubella epidemic, testalgia, a sign of orchitis, was discovered in 5 of 68 adults (7). In this study, we have for the first time developed an ELISA method for detection of anti-RV IgG from patients suffering from oligospermia and azoospermia.

2. Material and method

2.1 Serum and Sperm collection

One hundred samples (serum+ Semen) were taken from patients aged between 20–49 years, Whole blood was allowed to coagulate for one hour at room temperature in order to acquire the serum sample. The clot was then removed by centrifuging the blood at 2,000 rpm for ten minutes. The liquid (serum) was transferred into a clean polypropylene tube using a Pasteur pipette after centrifugation. Before processing, the serum samples were kept at (2–8 °C). (8), while the semen sample, all patients went at least two weeks without taking any antibiotics, following a 24-hour period of continence, sperm samples were collected via masturbation into a sterile wide-mouth beaker.

2.2 Sample Analysis

To find the sperm were oligozoospermia or azoospermia, all semen samples were liquefied for 30 min at room temperature and the pH, volume, motility, and concentration were tested according to World Health Organization (2010)

2.3 Detection of rubella virus using Enzyme Immunoassay (EIA)

Commercially available ELISA kits (Euroimmun, Lübeck, Germany) were used in line with the manufacturer's instructions to assess anti-RV IgG antibodies in serum. The effects of the antibodies were measured in international units per milliliter (IU/ml). The lower limit of detection was adjusted to 1 IU/ml. According to the manufacturer's procedure, the anti-rubella IgG ranges were classed as adverse, equivocal, and favorable when values of 8, 8-11, and 11 IU/ml were obtained, respectively.

Result and Discussion

The result obtained during this study showed variation in sperm quality, 33 (36.6%) of the samples were Azoospermia , 33 (36.6%) were Oligozoospermia while 34 (37.7%) were Normozoospermia (control group), the mean average age of the patients was 34.5 years. Result of sperm analysis showed a morphology (2.6%), concentration (10.6 million/ml), sperm progressive motility (≤ 27.5%) and pH level was (8.6).

As showed Table (1), the present study showed 26/90 (28.8%) were positive for anti-rubella IgG using Enzyme Immunoassay (EIA) while 74/90 (82.2 %) were negative according to the range of anti-rubella IgG levels. By using ELISA devices result also revealed that the anti-rubella IgG was positive in Azoospermia and Oligozoospermia patient by the percent (42.42%), (36.36%) respectively.

Table (1). Study sample distribution according to the presence of anti-rubella IgG antibodies in various categories.

The Groups	Positive No. (%)	Negative No. (%)	P-value
Azoospermia (No. = 33)	14 (42.42%)	19 (57.57%)	0.0001 **
Oligozoospermia (No. = 33)	12 (36.36 %)	21 (63.63%)	0.0001 **
Normozoospermia (No. = 34)	0 (0.00%)	34 (100%)	0.0001 **
P-value	0.00965 **	0.00965 **	---
**** (P<0.01).**			

Semen and reproductive tract tissues may both be infected by a variety of viruses, and the effects of these viral infections can be quite dramatic in terms of changes to the reproductive and endocrine systems, changes to organ integrity, and the development of illnesses (9).

The high quantity of immunosuppressive components present in seminal plasma clearly impairs the female vaginal tract's immune response to infectious agents present in this organic fluid. This is due to semen's capacity to transmit viruses in addition to its immunosuppressive effects. (10), Rubella viral infection of the testis may negatively impact spermatogenesis and increase the risk of testicular cancer. Additionally, it will be sexually contagious (11). According to virological investigations of the reproductive tracts of bulls following acute temporary infection, the seminal vesicles and the prostate gland are the most prolific sites for Rubella virus replication. Interstitial fibroplasia and mononuclear cellular infiltration caused the lesion to form. (12).

As showed Table (1), the present study there is novelty in result obtained, from 100 semen samples 66/100 (patient group) showed abnormal sperm quality (36.6%) were Azoospermia (male infertility) and (36.6%) were Oligozoospermia (difficult to conceive) in the both condition almost half of the cases, the anti-rubella IgG were positive which mean the infection with rubella virus could affect the reproductive system of human, rubella virus causes epididymitis, which is irritation (swelling and irritation) of the epididymis, a tube below the testicle that contains sperm. Rubella virus antigen was discovered using immunofluorescence inside the head of the epididymis. The testicle may experience excruciating pain as a result of this swelling (13)

Patients with epididymitis should be informed about safe sexual behavior. Additionally, those patients need to be advised to consume large amounts of fluids to flush their genitourinary systems and adhere to their antibiotic treatment regimen (14). The majority of men with epididymitis have favourable outcomes, however those who don't adhere to treatment may potentially experience relapses (15)

It has been demonstrated that vaccination with the stay-attenuated rubella virus vaccine can avoid contamination. Despite significant advancement, rubella remains a critical infection and global public health concern (16).

Conclusion

The study conducted that there is a direct relationship between rubella virus infection and infertility, testis infection by rubella virus may negatively impact spermatogenesis and increase the risk o infertility

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