

Relationship Between Spermatid Specific Thioredoxin-3 Protein and Antisperm Antibody in Patients with Varicocele Compared with a Control Group

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Abstract

The spermatogenesis process are very complex and involves many process to lead to give normal sperm , these sperms a very important to fertility in the men). Protein in the male fertility that is very important which give the significant job in fertilization. The infertile varicocele patient grade 1,2 and 3 (n= 25 , 25 and 25 respectively) compare with control patient (n=15). The present study Shown spermatid – specific thioredoxin 3 level a significant increase in varicocele patient grade 1,2 and 3 compare with control group (mean± Std. Error 17.97± 0.8 & 22.92±0.75 Respectively) .Also in Antisperm antibody a significant increase in varicocele patient grade 1,2 and 3 compare with control group (mean± Std. Error 73.85±2.71 & 45.6±1.44 Respectively). Consecutive (r= -0. 840, r = -0. 745 and r = -0. 475). Also theirs a negative correlation between Antisperm antibody level and the sperms concentration , Sperm Progressive motility percent and sperm normal morphology present in varicocele patient grade 1,2 and 3 Consecutive (r= -0.443 , r = -0.370 and r = -0.384) .

The result show a positive correlation was found between Spermatid specific thioredoxin-3 protein level and antisperm antibody level in varicocele patients .(The present study conclude that a negative function of Spermatid specific thioredoxin-3 protein and antisperm antibody which that appears on sperm function and sperm parameters , The study showed that spermatid specific thioredoxin-3 protein and antisperm antibody has a harmful effect with the time) .

Keywords - Spermatid Specific Thioredoxin-3 Protein (SPTRX3), ASAs, Varicocele

Introduction

The most successful fertility in pets. Also, fertility is a success against sperm DNA damage⁽¹⁾. Thioredoxin family proteins It participates in an anti-oxidant system and is one of various groups, as it has a role in cellular functions, There are three thioredoxins It is especially expressed in male mammals^(2,3). A group of proteins has been discovered in sperm, including Spermatid specific thioredoxin-3 SPTRX3 in the pro-acrosomic granule of round spermatids, which leads to a belief in its role in synthesis⁽⁴⁾. There are a number of mechanisms that stimulate autoimmunity and antisperm antibodies including the peripheral acceleration of cells Immuno-type-1, accelerate the secretion of pro-inflammatory cytokines and Tissue

necrosis factor⁽⁵⁾. Decrease anti-inflammatory cytokines (IL-10, TGF-β) tissue growth factor and/or major (histocompatibility complex, associated molecules for the expression of co-stimulatory molecules expression, and/or the descending complexity of the process of corrosion by immune cells⁽⁶⁾. TGF-β is A group of peptides of a special nature, as they control the spread, differentiation and many functions of cells⁽⁷⁾. TGF-β acts with TGFA Together, they make a difference as a negative autocrine growth factor ,Dysregulation of TGF-β It works to activate and produce signals in apoptosis⁽⁸⁾. Many cells synthesize TGF-β There are receptors on all cells that form this peptide , TGF-β1, TGF-β2, and TGF-β3 It has systems and shares the same indicators⁽⁹⁾. TGF-β1 It was first discovered in the last century in platelets and its role in recovery⁽¹⁰⁾. Finally it is described as a group

of the safe acids that produce this protein⁽¹¹⁾. There are a number of mechanisms that stimulate autoimmunity and antisperm antibodies including the peripheral acceleration of cells Immuno-type-1, accelerate the secretion of pro-inflammatory cytokines and Tissue necrosis factor (TNF-a)⁽¹²⁾. Decrease anti-inflammatory cytokines (IL-10, TGF-B) tissue growth factor and/or major histocompatibility complex, associated molecules for the expression of co-stimulatory molecules expression, and/or the descending complexity of the process of corrosion by immune cells^(13,14).

Materials and Methods

Samples were collected from semen and serum from infertile patients include (grade 1,2 and 3) As well as the control group from the infertility center of Al-Sadr Teaching Hospital, As the average age of the patients was (36.87±74) years, Years, collected 90 samples and 88 eyes were examined,)A biochemical test was performed on (88) samples had been measured between Spermatid specific thioredoxin-3 protein by immunological method (Enzyme-Linked-Immuno-Sorbent- Assay) by using ELISA reader (Huma Germany origin). Before using the samples, they were placed at room temperature, as well as the reagents. All fluids were used with great care to prevent any errors as the checks were done step by step, All examinations were carried out by the apparatus of the College of Science, Kufa University. Used ELISA kits as follows from the global company (between Spermatid specific thioredoxin-3 protein) (MBS9319574) and ASAs (MBS702581) MYBIOSOURCE USA in Origin).

Results

The result show a significant spermatid specific thioredoxin-3 protein level was increase in varicocele patient grade 2 and 3 (mean± Std. Error 17.97± 0.8 & 22.92±0.75 consecutive) also significant ASAs level was increase in varicocele patient grade 2 and 3 (mean± Std. Error 73.85±2.71 & 45.6±1.44 consecutive as in table 1), while the result show negative correlation between(spermatid specific thioredoxin-3 and the sperms concentration); sperm progressive motility and sperm normal morphology in patient with varicocele grade 1,2 and 3 consecutive (r= -0. 840, r = -0. 745 and r = -0. 475 as in table 2). Also theirs a negative correlation between antisperm antibody level and the sperms concentration

, sperm progressive motility percent and sperm normal morphology present in varicocele patient grade 1,2 and 3 consecutive (r= -0.443 , r = -0.370 and r = -0.384 as in table 3) .

The result show a positive correlation was found between spermatid specific thioredoxin-3 protein level and antisperm antibody level in varicocele patients) .

Table (1) : The comparison of antisperm antibody concentration in infertile varicocele patient grade 1,2 and 3 .

Groups	Antisperm Antibodies (pg/ml)
Grade 1	21.98 ± 0.44
Grade 2	45.6 ± 1.44
Grade 3	73.85 ± 2.71
Control	19.77 ± 0.42

Table (2) : The comparison of spermatid specific thioredoxin-3 protein with sperm concentration and sperm progressive motile in the serum infertile varicocele patient grade 1,2 and 3..

Groups	Spermatid Specific Thioredoxin-3 Protein (pg/ml)
Grade 1	9.87 ± 0.12
Grade 2	17.97 ± 0.8
Grade 3	22.92 ± 0.75
Control	9.55 ± 0.41

Table (3) : The correlation between spermatid specific thioredoxin 3 with sperm concentration and sperm progressive motile in infertile male

Sperm Parameters	Pearson Correlation Coefficient
Sperm Concentration	r = - 0.840
Sperm Progressive Motile	r = - 0.745

Table (4) : The correlation between antisperm antibody with sperm concentration, sperm normal morphology , sperm progressive motile in infertile male

Sperm Parameters	Pearson Correlation Coefficient
Sperm Concentration	r = - 0.443
Sperm Progressive Motile	r = - 0.370
Sperm Normal Morphology	r = - 0.384

Discussion

The current study showed a significant decrease ($p < 0.05$) of Spermatid specific thioredoxin3 protein level in infertile men grade 1, 2 and grade 3 male infertility compared with control group and show a negative correlation between Spermatid specific thioredoxin3 protein level and sperm concentration , sperm progressive motility in addition to sperm normal morphology these SPTRX3, In biological generation it has an important role to play in the structures of sperm and its dissolution in the semen, They also have many functions In various cellular activities, including DNA synthesis, they also act as antioxidants, regulators of apoptosis h, as well as immune response. These resulted may be effected in these SPTRX3, have a function during the biogenesis of sperm accessory structures but then are degraded within the spermatid cytoplasmic ,They also have many functions in Various cellular activities, where it is involved in the defense of sperm, from influences that act as antioxidants that prevent DNA damage and regulate apoptosis and immune response . The protein synthesis is affected by accompanying with increase free radicals ⁽¹⁵⁻¹⁷⁾ . The study by Moghbelinejad et. al., (2018) that showed a negative correlation between Spermatid specific thioredoxin3 protein with sperm parameter when showed a negative correlation between sperms count, sperm progressive motile and sperm normal morphology in Asthenozoospermia and also these study found the elevation of the SPTRX3 level in Asthenozoospermia compare with control.expressed in testis and localized to the Golgi apparatus of mammalian spermatocytes and spermatids. Interestingly, SPTRX-3

is more abundant in defective spermatozoa from infertile male ⁽¹⁸⁾ .

The current study showed a significant increase ($p < 0.05$) of antisperm antibody level in grade 2, 3 and non-significant increase of grade 1 male infertility compared with control group, while there was significant increase ($p < 0.05$) between grade 1 and grade 2,3 showmen, and show a negative correlation between antisperm antibody level and sperm concentration , sperm progressive motility in addition to sperm normal morphology , this result may be caused by the disruption of blood-testis barrier and this result is abnormal spermatogenesis ⁽¹⁹⁾, Our results agreed with the study that including 238 cases of ASA positive infertility male and 929 ASA negative controls, and show in patient with ASA positive infertility male that have reducing in sperm parameter while the patient with ASA negative controls that have normal sperm parameter and also this study illustrates the effect of ASA on semen liquefaction⁽²⁰⁾ .

Another study that agreement with our result these study including azoospermia (n=22), oligozoospermia (n=9) and control group (n=2), and show in a patient with azoospermia and oligozoospermia elevate of ASA concentration compare with the controlgroup and show the effected of ASA on sperm parameter ⁽²¹⁾ .

Conclusions

Spermatid specific thioredoxin-3 protein and Antisperm Antibody have a negative effective on sperm function when that lead to infertility .

Ethical Clearance : Taken from University of Kufa ethical committee

Source of Funding : Self

Conflict of Interest : Nil

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