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Study Some Parameters in Patients with Asthenooligozoospermia

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Abstract: Asthenooligozoospermia is a form of male infertility, which affects the quality of sperm motility and leads to decreased fertility rates, Current diagnostic and therapeutic methods fail to solve most infertility problems. Samples were collected from the Infertility Center at Al-Sadr Teaching Hospital, the results showed that infertile individuals had significantly higher levels of interleukin 17. The results indicated that the amount of testosterone and vitamin D decreased significantly. The parameters had a direct correlation with testosterone and vitamin D. The results showed that interleukin 17 and the parameters had an inverse correlation. semen as well as with testosterone. It can be said that the negative effect of the vitamin D has a negative impact on men in terms of fertility, due to low levels of testosterone, weak immunity or changes in sperm quality, which may lead to other problems.

Keywords: Asthenooligozoospermia, vitamin D, testosterone hormone and IL17.

Introduction:

Asthenooligozoospermia is a form of male infertility, which affects the quality of sperm motility and leads to decreased fertility rates (1,2). Current diagnostic and therapeutic methods fail to solve most infertility problems (3). A combined clinical and static examination leads to the identification of some cases of Asthenooligozoospermia(4,5). The diagnostic value in particular, and the characteristics of their semen compared to other male populations using an extreme standard search for features that have not been previously searched for in such males with Asthenooligozoospermia(6).

DNA damage, and the expression of some immune parameters in males are very important to know the causes of infertility (7,8). The causes of male infertility are broad and multifactorial, involving a combination of environmental, genetic, hormonal, and lifestyle conditions(9). Endocrine disruption can affect male reproductive health, leading to male infertility(10,11).

Several studies have recently focused on examining the adverse effects of endocrine disruption and attempting to identify their mechanisms in relation to male infertility(12). There has been interest in studying the beneficial effects of vitamin D on male reproduction, considering vitamin D's antioxidant, anti-inflammatory, and anti-apoptotic properties and its potential ability to metabolize hormones, such as testosterone(13).

Vitamin D may play a role in male reproductive function, including semen quality and androgen status (14,15). Academic research has shown a positive relationship between vitamin D concentrations and sperm quality (16). This quality is characterized by normal sperm motility, shape, and number. Studies suggest that vitamin D plays a critical role in male reproduction through effects on semen quality (17,18). The aim of this study was to know the causes of infertility and the effect of some on others.

Methodology:

This study included 58 male patients diagnosed with Asthenooligozoospermia who attended the infertility Center, Al-Sadr Medical City, Najaf, Iraq. All patients in this study were diagnosed by specialized physicians. The ages of the study participants ranged from 27 to 51 years. The study was conducted from February 2024 to October 2024.

Statistical analysis

Statistical analysis is often used to analyze quantitative data and provides methods for data description and simple inference for continuous and categorical data. In this study, all data are presented as mean ± standard deviation. The statistical analyses were performed using SPSS (version 26) and using dependent t-tests (two-tailed) and independent t-tests (two-tailed) for normally distributed variables, . $P < 0.05$ was considered statistically significant.

Ethical approval:

Before the samples were taken, all of the patients who were going to be part of this study were properly informed and gave their verbal permission. The Committee on Publication Ethics at the Al-Sadr Hospital.

Results:

Through laboratory tests for men with oligospermia, a condition characterized by low sperm count (oligospermia) and low sperm motility (asthenozoospermia), both of which can contribute to male infertility. Outcomes for male patients diagnosed with this condition usually depend on the underlying cause.

Table (1): Semen and sperm parameters for men with toxoplasmosis compared to the control group

Studied parameters	men with Asthenooligozoospermia	control group
Sperm count million /ml	9 ± 0.54*	68.13± 3.22
Sperm progressive motile	15.14± 0.12*	70.17±1.11
Sperm normal morphology	32.36± 0.29 *	65.45± 1.14
Viability sperm test	8.82± 0.47*	78.35± 0.16

The results inside the table represent mean± Std. Error,

* Denotes significant (P <0.05)

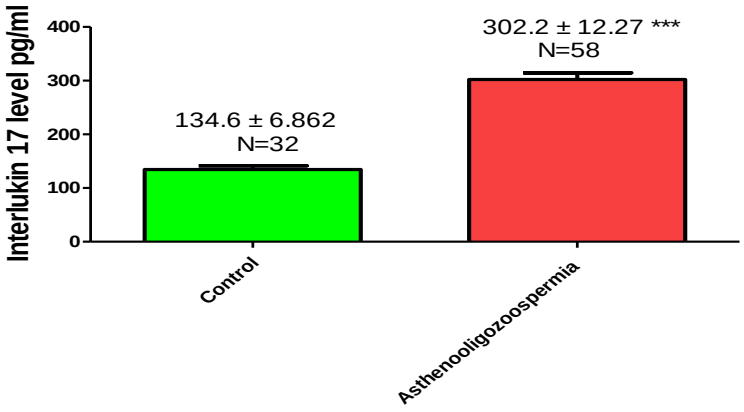

FIGURE1. comparison of IL17 level in the serum between men with Asthenooligozoospermia compared with control group., difference later indicates significant ($p < 0.05$)

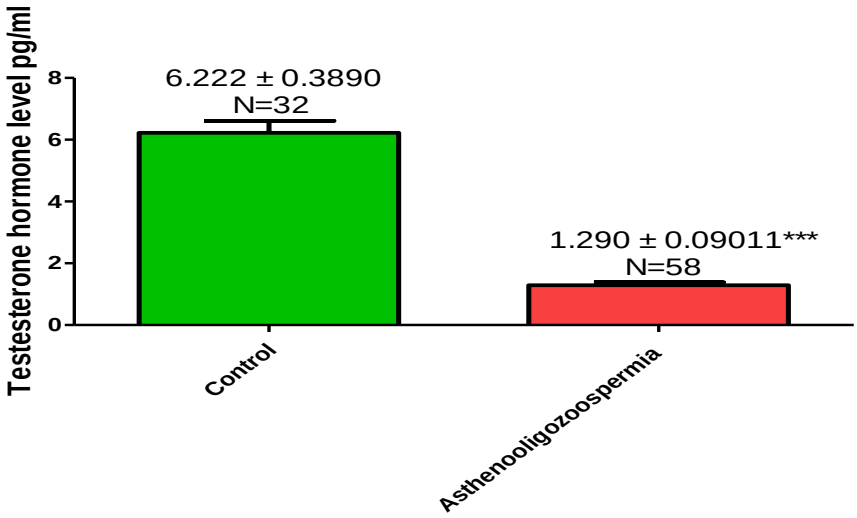

FIGURE2. comparison of testosterone hormone level in the serum between men with Asthenooligozoospermia compared with control group.,

* indicates significant ($p < 0.05$)

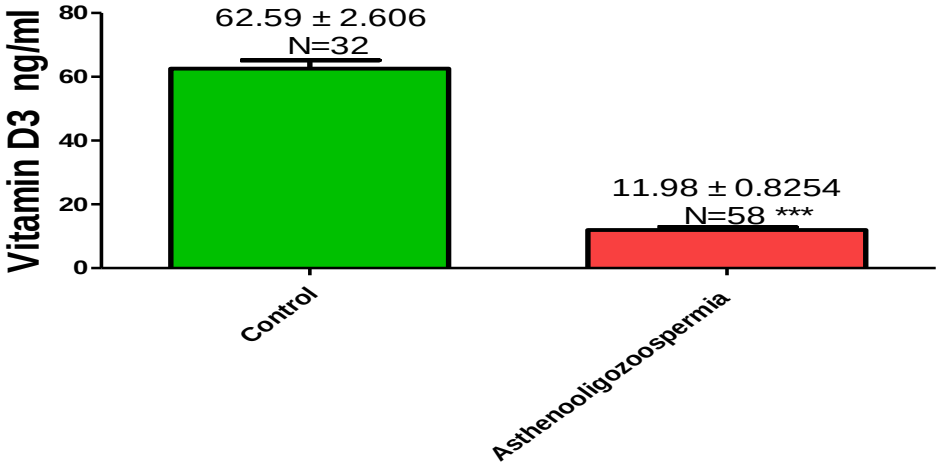

FIGURE3. comparison of D3 level in the serum between men with Asthenooligozoospermia compared with control group.,

* indicates significant ($p < 0.05$)

Table (2): The correlation between Interleukin 17 with sperm parameters in men's with Asthenooligozoospermia

Interleukin 17 with Sperm count	R= - 0.874
Interleukin17 with Sperm progressive motile	R = - 0.851
Interleukin 17 with Sperm normal morphology	R =- 0.758
Interleukin 17 with Viability sperm	R= - 0.875
Interleukin 17 with testosterone hormone	R = - 0.978

Table (3): The correlation between testosterone hormone with sperm parameters in men's with Asthenooligozoospermia

Testosterone hormone with Sperm count	R= + 0.967
Testosterone hormone with Sperm progressive motile	R = + 0.933
Testosterone hormone with Sperm normal morphology	R = + 0.966
Testosterone hormone with Viability sperm	R= + 0.923

Table (4): The correlation between Vitamin D3 with sperm parameters in men's with Asthenooligozoospermia

Vitamin D3 with Sperm count	R= + 0.781
Vitamin D3 with Sperm progressive motile	R = + 0.876
Vitamin D3 with Sperm normal morphology	R = + 0.872
Vitamin D3 with Viability sperm	R= + 0.879

Discussion:

Results showed decreased sperm count, motility, and morphology, and significantly decreased testosterone levels. Infection may also contribute to infertility by affecting semen parameters, oxidative stress, and testicular function. Studies suggest that sperm counts in men are reduced due to inflammation or direct damage to the testicles. Decreased motility is observed, possibly due to increased oxidative stress or structural damage to the sperm tail (19,20). An increased incidence of abnormal sperm morphology, including defects in the head and tail, may be observed. Infection leads to increased levels of reactive oxygen species, which cause oxidative damage to sperm DNA, lipids, and proteins(21,22).

Chronic inflammation can lead to an inflammatory response in the testicles or accessory glands, resulting in: Elevated levels of the cytokine IL-17 in the semen, which is toxic to sperm. This leads to structural damage to the seminiferous tubules and impaired spermatogenesis. Dysfunction of the hypothalamic-pituitary-gonadal (HPG) axis results in decreased levels of testosterone, which is essential for sperm formation (1,23).

Increased levels of inflammatory mediators that interfere with hormonal regulation. Finally, sperm DNA fragmentation is common in affected men, reducing the possibility of sperm fertilization and increasing the risk of embryo failure (24,25).

Conclusion

Infertility can significantly impact male fertility through multiple pathways, including oxidative stress, inflammation, and hormonal disturbances. Early diagnosis, effective treatment, and management of oxidative damage are essential to improve reproductive outcomes in affected men. Further research is needed to explore the precise mechanisms and develop targeted therapeutic strategies.

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