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Asthenozoospermic Causes for Infertile Males in Thi-Qar City

Sumeya Ghanawy AL-Najjar

College of Medicine, University of Thi-Qar, Iraq

Abstract---This is a study that aim to investigate the most common cause of asthenospermia in Thi-qar province. The results of the study clarified that the most common cause of asthenospermia in Thi-Qar province is varicocele the most affected occupations are the bakers and the bulk of cases was primary infertility and the most affected age group is 15-35. The results of this study showed that the primary infertility (60%) was more than secondary infertility (40%) as it is obvious from table 4. However, in males with primary infertility, chromosomal and genetic causes play an important role in the existence of primary more than secondary infertility.

Keywords---asthenozoospermic, infertile males, primary infertility, Thi-Qar, varicocele.

Introduction

Introduction Semen analysis is the method of choice in assessing male infertility. During ejaculation, semen is produced from a concentrated suspension of spermatozoa, stored in the paired epididymides, mixed with, and diluted by, fluid secretions from the accessory sex organs. Comparison of pre- and post-vasectomy semen volumes reveals that about 90% of semen volume is made up of secretions from the accessory organs, mainly the prostate and seminal vesicles, with minor contributions from the bulbourethral (Cowper's) glands and epididymides (Duncan & Thompson, 2007).

Submicroscopic defects of sperm tail structure are associated with severely reduced or absent motility in infertile men. Electron microscopy associated with immunocytochemical investigations has allowed for the classification of sperm structural defects as nonsystematic or systematic (Baccetti et al., 2001; Chemes & Rawe, 2003).

- Progressive motility (PR): spermatozoa moving actively, either linearly or in a large circle, regardless of speed.

- Non-progressive motility (NP): all other patterns of motility with an absence of progression, e.g. swimming in small circles, the flagellar force hardly displacing the head, or when only a flagellar beat can be observed.
- Asthenozoospermia; total motility (PR + NP) < 40% or progressive motility (PR) < 32% (WHO, 2010).

Male infertility is a medical and psychosocial global problem, and it accounts for approximately 40% of infertility in couples. Infertility itself affects about 7% of all couples attempting pregnancy (Baklouti-Gargouri et al., 2013). Asthenozoospermia is a multifactor syndrome that affects approximately half of males with infertility. It could possibly be caused by defects in spermatozoa tail development or by energyproducing machinery defects that are essential to drive motility (Lotti & Maggi, 2015). Varicoceles are present in 15 percent of the normal male population and in approximately 40 percent of men presenting with infertility (Lipshultz et al., 2009). Varicoceles are found in 19 to 41% of infertile men, and is one treatable form of male infertility. The role of hyperthermia, testicular blood flow and venous pressure changes, reflux of renal/adrenal products, hormonal dysfunction, autoimmunity, defects in acrosome reaction, and oxidative stress, in the pathophysiology of varicocele will be discussed (Naughton et al., 2001).

Materials and Method

We had done a research in infertility department in Alhussain-teaching hospital in Thi-Qar about causes of asthenospermia in the reported cases from November 2018 till November 2020. This study involved infertile couple, SFA was done to evaluate male factors. Males with normal seminal fluid parameters were excluded only males with asthenozoospermia were studied. SFA was examined according to WHO 2010. Informations such as age, duration of infertility and type of infertility were taken.

Seminal fluid analysis

The sample of seminal fluid was collected after 3-5 days of sexual abstinence directly into a clean, dry and sterile disposable Petri-dish by masturbation in a private and quiet room adjacent to the semen analysis laboratory. The container must be labeled with the following information, name, age, abstinence period and time of sample collection. The specimens were placed in an incubator at 37 °C for 30 minutes to allow liquefaction. The liquefied semen is then carefully mixed for few seconds, and then the specimen was examined by macroscopic and microscopic examinations. The standard form of (WHO 2010) is used to record the results of seminal fluid analysis (Table 1).

Table 1
Show normal values of semen variables (WHO, 2010)

Sperm parameters	WHO Criteria
Sperm concentration millions/mL	15x10 ⁶ spermatozoa/mL or more
Total sperm motility (%)	>40%
Sperm Progressive motility (%)	>32%

Grade	Non Progressive motility (%)
Activity	Immotile sperm (%)
Normal sperm morphology (%)	>30%*

Result

- Table (2) show the causes of Asthenozoospermia, in which the varicocele is significantly higher than other causes.
- Table (3) discuss the occupations of infertile males, from this table we notice that the significant value is for bakers.
- Figure (1) explain the type of infertility which show that primary infertility significantly higher than secondary infertility,
- Figure (2) show the age group of the infertile males, from this figure the age (16-35) form the largest age groups.

Table 2
Frequency of reported causes of Asthenospermia

	Frequency	Percent
Calcific	1	1.1
Hydrocele	11	12.4
Idiopathic	11	12.4
Iguinal mass	1	1.1
Infection	2	2.2
Inguinal	1	1.1
Mass + H	1	1.1
Varicocele	61**	68.5
Total	89	100.0
Chi-Square	267.94	
sig	0.0005**	

Highly significant different (P<0.01)*

Significant different (P<0.05) **

Table 3
Show occupation of the infertile males

	Frequency	Percent
Baker	30**	33.7
Driver	7	7.9
Guardian	1	1.1
Military	18	20.2
Officer	9	10.1
Retired	2	2.2
Smith	1	1.1
Teacher	4	4.5
Worker	17	19.1
Total	89	100.0

** Highly significant different (P<0.01)

* Significant different (P<0.05)

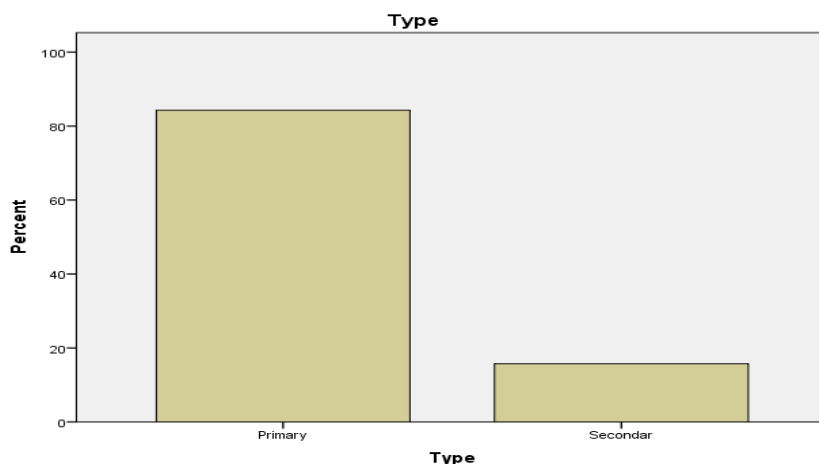


Figure 1. Types of infertility

Table 4
Types of infertility

Chi-Square	29.22
sig	0.00008**

** Highly significant different (P<0.01)

* Significant different (P<0.05)

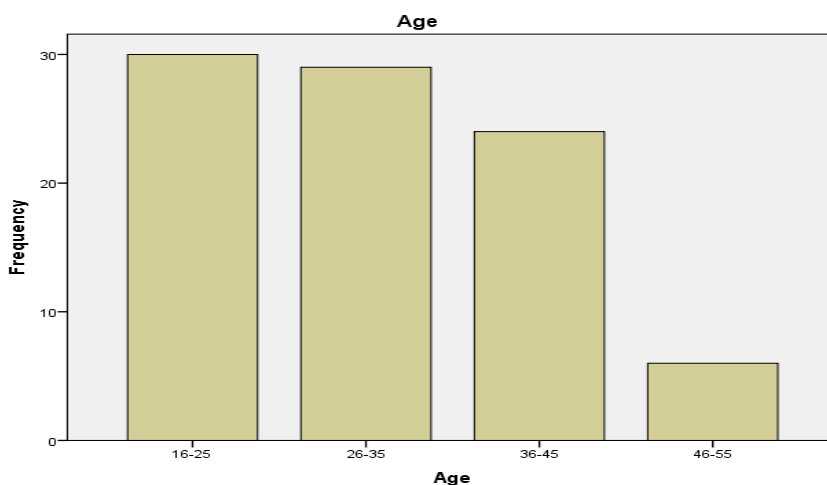


Figure 2. Age groups of infertile males

Discussion

The results of this study showed that the primary infertility (60%) was more than secondary infertility (40%) as it is obvious from table 4. However, in males with primary infertility, chromosomal and genetic causes play an important role in the existence of primary more than secondary infertility (Madoro et al., 2003). The presence of inflammatory cells (often peroxidase-positive granulocytes) suggests

an ongoing inflammatory reaction and in addition, spermatozoa exposed to seminal vesicular fluid show decreased motility, survival and protection of the sperm chromatin [Jequier \(2006\)](#), indicating that an abnormal sequence of ejaculation can cause decreased sperm function. Reduced spermatozoa motility can therefore be a symptom of disorders related to male accessory sex gland secretion and to the sequential emptying of these glands [\(Bjorndahl, 2010\)](#).

Conclusion(s): We report a new sperm defect, characterized by abnormal elongation of the tail, which was prone to ruptures at different levels, concomitant with coiled tails, which were impossible to measure in length. This defect remained constant in different examined ejaculates and applied to the entire sperm population of a sterile man, the son of first-degree cousins, indicating a potential genetic origin [\(Collodel et al., 2011\)](#). Varicocele is the most common cause of male infertility in the Western world [\(Chambers et al., 2017; Olegovich Bokov et al., 2022; Zainab et al., 2021\)](#). This disease is unique to the human species, and it results from the destruction or the bypass of the one-way valves in the internal spermatic veins (Figure 1). The pathogenic mechanisms include increased hydrostatic pressure in the testicular venules [\(Gat et al., 2005; Huldani et al., 2022\)](#). Elevated scrotal temperatures have been found to have a detrimental impact on sperm production through multiple mechanisms including apoptosis (programmed cell death) of spermatogenic cells, increased oxidative stress, and sperm DNA damage [\(Durairajanayagam et al., 2015; Ansari et al., 2022\)](#). Decreased semen parameters have been documented in bakers as well as ceramic oven operators [\(Mohammed & Qasim, 2021\)](#).

Conclusion

This study is the first in Egypt that is concerned with studying the relationship between the mitochondrial DNA mutations in human spermatozoa of asthenozoospermic patients and fertility. The results displayed scientific indications evidenced that there is an association between mitochondrial mutations and male infertility. The results of this study showed that the primary infertility (60%) was more than secondary infertility (40%) as it is obvious from table 4 . However, in males with primary infertility, chromosomal and genetic causes play an important role in the existence of primary more than secondary infertility. Male fertility generally starts to reduce around age 40 to 45 years when sperm quality decreases. Increasing male age reduces the overall chances of pregnancy.

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