Seminal Fluid Abnormality among Infertile Males: A Two-Center Based Study in Baghdad

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ABSTRACT:

BACKGROUND:

Infertility is an inability to conceive naturally after one year of regular unprotected intercourse for problems in either one partner or both causing a major cost burden for both patients and health care systems.

BJECTIVE:

To measure the proportion of different types of abnormalities of seminal fluid among infertile men and to unravel the factors associated with such abnormalities.

PATIENTS AND METHODS:

A cross-sectional study in which a purposeful sample of 300 infertile males who attended infertility department at Al- Imamain Al- Kadhimain Teaching Hospital and Baghdad Teaching Hospital during the period from 1st of February to 31st of August, 2018 in Baghdad governorate-Iraq with at least one- year infertility were included and interviewed for their demographic data and assessing their seminal fluid parameters. Chi-square test was used to identify the significant association between categorical variables and P-value of <0.05 was considered as statistically significant.

RESULTS:

More than 75% of the studied group have primary infertility. Abnormal morphology (teratozoospermia) was the most common type of semen defect found in the studied infertile males (76%). A statistically significant association was found between occupation and seminal fluid parameters.

CONCLUSION:

The majority of infertile males have primary infertility type and teratozoospermia was the most common type of semen defect. percentage of semen defect has increased with increased age and has correlated to occupational exposures.

KEYWORDS: Infertile males; seminal fluid abnormalities; seminal fluid parameters

INTRODUCTION:

In 2010, an estimated 48.5 million couples worldwide were infertile, where both males and females are equally responsible for this infertility state. [1]. Male infertility rates were highest in Africa and Central/Eastern Europe, whereas rates for North America, Australia, and Central and Eastern Europe varied from 4.5-6% and 8-12%, respectively [2].

Two types of infertility are recognized: primary infertility (a couple who have no previous pregnancies) and secondary infertility (for those who have conceived previously, even those with miscarriage and ectopic pregnancy) [1].

Several conditions contribute to male infertility, including problems related to the sperm, seminal fluid, or male reproductive organs [3].Other conditions contribute to male factor infertility, including environmental, occupational factors along with lifestyle practices that contribute to the deterioration of semen quality [4].

Some of the causes of abnormal semen can significantly affect male fertility, such as sexually transmitted infection, retrograde ejaculation, and the ability of the ejaculate to clot properly, [5].

Low semen volume may be caused by an obstruction of the vas deferens, absence or blockage of the seminal vesicle, partial retrograde ejaculation, or a hormonal imbalance [6,7].

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Some believed that abnormal sperm shape has an even greater effect on male fertility than low motility or oligospermia (low sperm count) [8].

Abnormally low sperm counts can also be caused by certain medications, recent illness accompanied by high fever, and exposure of the scrotum to heat (as in a hot tub), stress (emotional, psychological, and physical), drug use, smoking, nutritional deficiencies, obesity, and environmental toxins [9].

Asthenozoospermia (poor sperm motility) may be caused by illness, certain medications, nutritional deficiencies, or smoking. Many of the causes of low sperm count can also cause poor motility [10]. Varicocele has been known to cause male fertility problems such as a low sperm count, decreased sperm motility, and abnormally shaped sperm [11].

Infertility can result from disorders of the testicles themselves, tumors or an abnormality affecting other hormonal systems including the hypothalamus, pituitary, thyroid and adrenal glands. [12].

Anti-sperm antibodies [13] and prior surgeries [14] as vasectomy, inguinal hernia repairs, scrotal or testicular surgeries, prostate surgeries, and large abdominal surgeries performed for testicular and rectal cancers, may prevent sperm ejaculate.

The present study aimed to measure the proportion of different types of seminal fluid abnormalities and to identify their associated socio-demographic factors.

PATIENTS AND METHODS:

In this a cross-sectional study, a purposeful sample of 300 infertile males, attending infertility departments at Al- Imamain Al-Kadhimain Teaching Hospital and Baghdad Teaching Hospital/ Medical City Campus from February to August 2018 and who were eligible and agreed to participate, were enrolled to interview using a specially designed questionnaire prepared by the researcher and approved by a panel of experts in community and family medicine.

The data collection format sheet consists of four sectors; First, socio-demographic characteristics of the participants (include age, occupation, address, smoking and alcohol history); Second, past medical, surgical and drug history; Third, duration of infertility and type of infertility (primary or secondary) and fourthly, anthropometric measures of weight and height of all participants.

The standard semen values of the World Health Organization (2010) were used. These values are (i) semen volume at least 1.5 ml, (ii) sperm count at least 15 million/ml, (iii) motility at least 40%, (iv) morphology at least 4% normal forms [15].

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) program version 20. The study was approved by the Scientific Committee at the Department of Family and Community Medicine, College of Medicine, University of Baghdad and the Scientific Council of Iraqi Board for Medical Specialization – Council for Family and Community Medicine.

RESULTS:

The study included 300 infertile males. The median age was 34.9 ± 8.5 years (age range from 20 to 69 years). The PH of the seminal fluid was abnormal in 84.3% of the candidates, the count was normal in 73.0%, oligospermia was found in 18.0% and azospermia was found in 9.0% of the cases. Most of the candidates were with evidence of infection (pus cells presented in 96% of candidates) while only 4% were with no evidence of infection. Abnormal motility was found in 29.3% of the candidates and abnormal morphology was found in 73.6% of them while the volume was normal in 83.3% (Table 1).

The association was statistically significant between primary and secondary infertility regarding the count of sperms (P=0.01), motility (P=0.003) and morphology (P=o.o2) (Table 2).

Significant associations were found between occupation with semen count (P=0.02), motility (P=0.03) and morphology (P=0.03) (table 3).

Table (1): Seminal fluid analysis

Seminal Fluid Analysis	No. (%)
PH	
Normal	47 (15.7)
Abnormal	253 (84.3)
Pus cells / HPF	
Nil	12 (4.0)
Present	288 (96.0)
Count (million/ml)	
Normal	219 (73.0)
Oligospermia	54 (18.0)
Azoospermia	27 (9.0)
Motility (%) **	
Normal	193 (70.7)
Abnormal	80 (29.3)
Morphology (normal forms %) **	
Normal	72 (26.4)
Abnormal	201 (73.6)
Volume / ml	
Normal	250 (83.3)
Abnormal	50 (16.7)

** The total number is 273 after exclusion of 27 patients with azoospermia (no sperms)

Table (2): Statistic analysis for parameters of seminal fluid with different types of infertility

Seminal Fluid Analysis	Type of Infertility		Total No. (%)	P-Value
	Primary No. (%)	Secondary No. (%)		
PH				
Normal	36 (12.0)	11 (3.7)	47 (15.7)	0.263
Abnormal	197 (65.7)	56 (18.6)	253 (84.3)	
Pus cells / HPF				
Nil	11 (3.7)	1 (0.3)	12 (4.0)	0.093
Present	222 (74.0)	66 (22.0)	288 (96)	
Count (million/ml)				
Normal	160 (53.3)	59 (19.7)	219 (73.0)	0.01*
Oligospermia	48 (16.0)	6 (2.0)	54 (18.0)	
Azoospermia (no sperms)	25 (8.3)	2 (0.7)	27 (9.0)	
Motility (%) **				
Normal	137 (50.2)	56 (20.5) 12	193 (70.7)	0.003*
Abnormal	68 (24.9)	(4.4)	80 (29.3)	
Morphology (normal forms %) **				
Normal	52 (19.1)	20 (7.3)	72 (26.4)	0.02*
Abnormal	153 (56.0)	48 (17.6)	201 (73.6)	
Volume / ml				
Normal	195 (65.0)	55 (18.3)	250 (83.3)	0.757
Abnormal	38 (12.7)	12 (4.0)	50 (16.7)	

*The association is statistically significant

** The total number is 273 after exclusion of 27 patients with azoospermia (no sperms)

Table (3): association of seminal fluid analysis with occupation

Seminal Fluid Analysis	Occupation				P-Value
	Military No. (%)	Office No. (%)	Workers No. (%)	Bakers, Drivers, Farmers No. (%)	
Count (million/ml)					
Normal	40 (13.3)	50 (16.7)	104 (34.7)	36 (12.0)	0.02*
Oligospermia	3 (1.0)	11 (3.7)	15 (5.0)	14 (4.7)	
Azoospermia (no sperms)	1 (0.3)	7 (2.3)	10 (3.3)	9 (3.0)	
Motility (%) **					
Normal	40 (14.7)	46 (16.8)	97 (35.5)	34 (12.5)	0.03*
Abnormal	4 (1.5)	15 (5.5)	22 (8.0)	15 (5.5)	
Morphology (normal forms %) **					
Normal	11 (4.0)	17 (6.2)	35 (12.8)	9 (3.3)	0.03*
Abnormal	32 (11.7)	43 (15.8)	84 (30.8)	42 (15.4)	
Volume / ml					
Normal	38 (12.7)	55 (18.3)	104 (34.7)	53 (17.7)	0.4
Abnormal	6 (2.0)	13 (4.3)	25 (8.3)	6 (2.0)	

*The association is statistically significant

** The total number is 273 after exclusion of 27 patients with azoospermia (no sperms)

DISCUSSION:

Seminal fluid parameters

The oligospermia (18%) recorded in this study was significantly lower than what was reported in Nigeria by Chukwunyere, et al (2015) [16], this may be attributed to differences in the study design.

The azoospermia (9%) found in this study compares favorably with a similar Saudi study [17], but was lower than what was noticed in Nepal [18].

Ugwa et al, (2015) [19]., in their study in Nigeria found that 26.98% of their patients were azoospermic and 20.64% were oligospermic. These findings may be due to differences in the number of the studied population.

The percentage of sperms' motility found in this study was lower than what was obtained earlier by another Iraqi study [20], and was in sharp contrast with Indian study by Ugboaja et al (2010) [21] who reported reduced sperms' motility in 16.7% of their studied men. These differences in results may be attributed to the differences in study design and sampling techniques.

Abnormal morphology results found in the current study agreed with the results of an Indian study by Jajoo et al (2013) [22] who showed that 69% of their studied men had abnormal morphology, but disagreed with another Indian study by Prashant Joshi, et al (2011) [23] where (28%) abnormal sperm morphology was reported.

A study carried out by Bhaduri, et al. in India (2015) [24] showed that only 7.45% of their patients were with abnormal semen volume whereas in the Nigerian study [25] 33.8% males had semen volume less than normal. These findings may be due to the differences in sexual abstinence duration (prior to semen donation) or the differences in the seminal fluid collection method.

Type of infertility and semen parameters

The results of the present study agreed with a previous study in Ghana (2014) [26], which reported various abnormalities in seminal fluid that differed significantly between primary and secondary infertile males.

In contrary to our results, in Oman, Gowri et al in 2010 [27] showed that sperm motility, sperm count and abnormal forms of the semen were not significantly different between men with primary and secondary infertility.

Occupation and semen parameters

The current study results were concomitant with those reported by Al-Quzwini, et al in Iraq (2016) and Ahmedi, et al in Iran (2014). [28, 29]

On contrary to the results of this study, an Iranian study by vaziri et al (2011) [30] concluded that there were no statistically significant differences in the sperm count or sperm morphology among different occupational categories who were referred to the Infertility Research Center in Tehran for treatment of their infertility. The relatively small number of the enrolled sample ,as well as the true nature of unknown jobs, could be the reason for our findings as compared to the aforementioned study.

CONCLUSIONS:

The majority of the infertile males have primary infertility type. Teratozoospermia (abnormal morphology) was the most common seminal defect type. The percentage of seminal defects has increased as the age increased and has correlated to occupational exposures.

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