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# A Study of Infertility Cases in Males in Basrah Province

Hussein Alaa Edan
*Pathological Analysis Techniques Dept./ Health & Medical Techniques/ College Southern Technical University*
Basrah, Iraq
hussienalaa365@gmail.com

Dawood Salman Mahdi
*Pathological AnalysisTechniquesDept./Health & Medical Techniques College /Southern Technical University*
Basrah, Iraq
dr.dawds@stu.edu.iq

Ihsan Edan Alsaimary
*Microbiology Dept./ Collage of Medicine, University of Basrah*
Basrah, Iraq
Ihsan.alsaimary@uobasrah.edu.iq

***Abstract*—Infertility remains a global health challenge with devastating psycho-social consequences in many communities, and the underlying long-term risk of couple separation is also a major clinical and social problem. Infertility is defined as the inability of a couple to conceive naturally after one year of intercourse.**

**A case-control study was carried out among males who have infertility and who attended the Infertility and in vitro fertilization Center of Basrah province in the period extended from September 2021 to June 2022. A questionnaire was used to record The special notes. Seminal fluid samples were collected from (176 patients and controls were divided into 88 patients of male samples and 88 samples of the control group). In the present study, age was divided into three groups, which were statistically non-significant. The residence was also non-significant, which included central and peripheral areas. The results also showed no statistical significance between smokers and nonsmokers. The laboratory results showed that the analyzed seminal fluid parameters such as volume, sperm count, grade A, grade D, and Morphology of sperm in the patient's group differed significantly from that of the control group (P. value <0.05). Compared to primary infertility (N=61,34.6%) or secondary infertility (N=27,15.4%), the analyzed seminal fluid parameters showed no statistical significance. In addition, the seminal fluid abnormalities, which were divided into six groups, that were found significantly statistically significant in patients from controls, include asthenozoospermia, necrozoospermia, teratozoospermia, and leukocytopenia. (P. value <0.05).**

***Keywords*— Male infertility, Primary infertility, Secondary infertility, Seminal fluid, Basrah**

## I. INTRODUCTION

Infertility is still a problem for couples all over the world. Clinically, it is described as a couple's inability to conceive after a year of frequent sexual intercourse (Hamada et al., 2012). Infertility affects 13-18% of couples, with the male factor accounting for up to 50 % of all cases (Havrylyuk et al., 2015). Many prognostic factors of male infertility include; infertility type (primary and secondary), duration, results of semen analysis, age, and fertility status of the female partner (A Jungwirth et al., 2015). The World Health Organization (WHO) defines primary infertility as a woman that has never conceived, whereas secondary infertility is the inability to conceive in a couple who has had at least one successful pregnancy (Benksim et al., 2018).

On the other hand, primary Infertility is found in 67 % to 71% of patients, and secondary infertility is found in 29% to 33 % of patients. However, Infertility affects around one in every ten couples for various reasons. Male infertility is a complex syndrome that includes a wide range of disorders. The cause of infertility is unknown (idiopathic) in more than 50% of infertile men, and it could be congenital or acquired (Poongothai et al., 2009). Male infertility can be caused by a variety of reasons, including medical (inherited or acquired), environmental (chemical compounds, chemotherapeutic agents, radiation, pollution, and stress), and lifestyle factors (smoking, alcohol use, illegal recreational drugs use) (Naz & Kamal, 2017). Many studies have found that as men age, their fertility declines owing to changes in all sperm parameters (Harris et al., 2011; Kidd et al., 2001). Sperm concentration, sperm motility, and seminal volume decrease with age (Naz & Kamal, 2017).In addition, Male smokers had lower sperm counts, poor sperm motility, more defective sperm, and lower testosterone levels(Sharma, 2017).To assess male infertility, the urologist takes the case history and performs a physical examination, including semen analysis (ASRM, 2012). After semen analysis, an infertile male may present with the following conditions: (a) oligozoospermia (decreased spermatozoa count), (b) teratozoospermia (abnormal sperms), (c) asthenozoospermia (decreased sperm motility), When these abnormalities are found together in semen analysis this condition is called oligoasthenoteratozoospermia syndrome (Andreas Jungwirth et al., 2012).The study aimed to show deference in seminal fluid parameters and seminal fluid anomalies between patients and control groups and also shows the association of infertility with age, smoking, residence,duration, and type of infertility.

## II. MATERIAL AND METHODS

### A. Study samples

This case-control study was conducted between September 2021 and June 2022 in the Governorate of Basrah. A questionnaire was used to record special notes, including; age, varicocele, duration of the marriage, infertility type, other diseases, drugs, and smoking. Seminal fluid samples were collected from the male patients at the Infertility and in vitro fertilization Center of Basrah Governorate. In seminal fluid,176 samples were divided equally into patient samples and control groups. The samples were collected by masturbating and ejaculating into a clean,

sterile, wide-mouthed glass or plastic container after 3 to 7 days of abstinence.

*B. Seminal fluid analysis*

Seminal fluid samples were evaluated according to the World Health Organization criteria (WHO, 2010). First, the macroscopic examination included PH measuring, volume, color, and clamping, then the sample was put in the incubator at 37$^{o}$C to liquefy, after seminal fluid liquefaction for 30 min at 37°C.Second, a microscopic examination was done by taking one drop from the sample (by micro dropper, one drop=5 µl)and put on the glass slide, which was covered by a cover slip without air babbles, after then examined under a microscopic lens,sperm count was made in 4–5 fields in high power field as well as motility, sperm morphology, whether aggregation and white blood cells are found or not.

*C. Exclusion criteria*

All patients have atopic diseases, autoimmune diseases, infectious diseases, varicocele, and reproductive organ surgery.

*D. Statistical analysis*

Statistical analysis was performed with SPSS (Standard Program for Social Science) version 23 and Microsoft Excel 2010. Continuous data were expressed as the mean and standard deviation of the mean. Spearman correlation was used to compare different groups because of non-parametric data distribution; Chi-square, Mann-Whitney U Test, and Fisher's Exact Test were used for small sample sizes. The lowest accepted statistical significance was 0.05 or less.

## III. RESULTS

Table (1) shows the age of the patients, which were allocated into three groups. This classification was used because of the small sample size. The first group consistsof 53.2% of patients with age less than 30 years or younger, which is the most frequent age group in the study. The second group consistedof 38.7% of patients with age ranged 31-40, whereas the last group, 8.1% of patients with age more than 40 years, when the distribution of patients and control were compared to each other according to age groups, there were no significant statistical differences found (P. >0.05).

**TABLE1.** THE NUMBER OF THE STUDY POPULATION ACCORDING TO AGE GROUPS.

| Age group (year) | Category | | | | Total | | P. value |
|---|---|---|---|---|---|---|---|
| | Patient | | Control | | | | |
| | No. | % | No. | % | No. | % | |
| **< 30** | 47 | 53.2% | 33 | 37.5% | 80 | 50.0% | **0.150** |
| | | | | | | | |
| **From 31 to 40** | 34 | 38.7% | 33 | 37.5% | 67 | 38.5% | |
| | | | | | | | |
| **> 40** | 7 | 8.1% | 22 | 25.0% | 29 | 11.5% | |

* Chi-Square Test

Table (2) shows the patients with a smoking habit divided into smoker 50% and nonsmoker 50% and also show the residents, which also divided into central 48.4% and peripheral 51.6%, When the distribution of patients and control groups were compared to each other according to smoking, and residency, there were no significant statistical differences found (P. >0.05).

**TABLE2.**THE DISTRIBUTION OF THE PATIENTS AND CONTROLS ACCORDING TO CERTAIN DEMOGRAPHIC FACTORS.

| | Patient | | Control | | P. value |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| **Smoking:** | | | | | |
| **No** | 44 | 50.0% | 33 | 37.5% | **0.372** |
| **Yes** | 44 | 50.0% | 55 | 62.5% | |
| **Residency:** | | | | | |
| **Central** | 43 | 48.4% | 44 | 50.0% | **0.908** |
| **Peripheral** | 45 | 51.6% | 44 | 50.0% | |
| **Total** | 88 | 100.0% | 88 | 100.0% | |

* Chi-Square Test

Table (3) shows the infertility type (primary and secondary) compared with the duration of infertility divided into six groups, where the largest group, 38.6%, ranged from 5-10years. no significant statistical difference could be found between the type of infertility and the duration of infertility (p. > 0.05).

**TABLE3.** DURATION AND INFERTILITY TYPE AMONG PATIENT GROUPS.

| Duration (year) | Infertility type | | | | Total | | P. value |
|---|---|---|---|---|---|---|---|
| | Primary | | Secondary | | | | |
| | No. | % | No. | % | No. | % | |
| **1** | 11 | 18.2% | 3 | 11.1% | 14 | 16.1% | **0.799** |
| **2** | 7 | 11.4% | 6 | 22.2% | 13 | 14.5% | |
| **3** | 8 | 13.6% | 2 | 5.6% | 10 | 11.3% | |
| **>3 to <5** | 4 | 6.8% | 3 | 11.1% | 7 | 8.1% | |
| **5-10** | 24 | 38.6% | 10 | 38.9% | 34 | 38.7% | |
| **>10** | 7 | 11.4% | 3 | 11.1% | 10 | 11.3% | |
| **Total** | 61 | 100.0% | 27 | 100.0% | 88 | 100.0% | |

* Fisher's Exact Test

Table (4) it can be seen that the analyzed seminal fluid volume, sperm count, grade A, grade D, normal morphology, and abnormal morphology of patients differs significantly from that of controls (P. <0.05).

**TABLE4.**SEMINAL FLUID ANALYSIS RESULTS IN PATIENTS AND CONTROL.

| Parameters | Patient | Control | P. value |
|---|---|---|---|
| | Mean ±SD | Mean ±SD | |
| **PH (scale)** | 7.54±0.09 | 7.50±0.11 | 0.738 |
| **Volume (ml)** | 2.52±1.12 | 3.50±0.52 | **0.0001** |
| **Count ($10^6$/ml)** | 31.77±23.89 | 65.00±7.75 | **0.0001** |
| **Motility Grade A%** | 6.13±6.03 | 57.81±5.76 | **0.0001** |
| **Motility Grade B%** | 15.97±15.81 | 19.06±4.90 | 0.123 |
| **Motility Grade C%** | 11.21±9.90 | 12.81±2.56 | 0.279 |
| **Motility Grade D%** | 44.03±30.54 | 10.31±1.25 | **0.001** |
| **Normal Morphology** | 28.23±21.50 | 72.81±5.76 | **0.0001** |
| **Abnormal Morphology** | 49.19±30.72 | 27.19±5.76 | **0.001** |
| **WBC** | 2.63±6.21 | 6.69±13.04 | 0.779 |

* Mann-Whitney U Test

In Figure (1), the analyzed seminal fluid, when compared according to the infertility type, had no significant statistical differences found (P. >0.05).

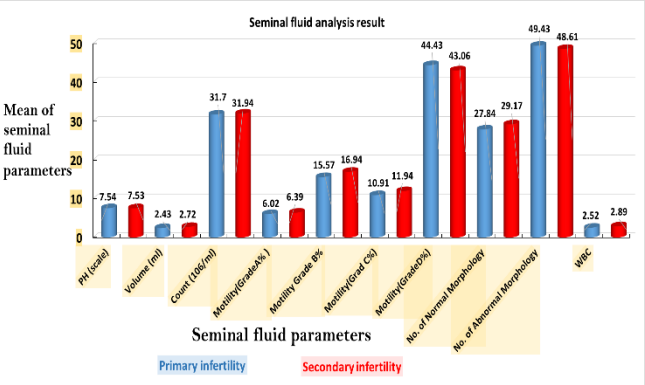



**Fig. 1.**Seminal fluid analysis according to infertility type.

Table (5) show the seminal fluid abnormalities in patients divided into six groups that significantly differ in patients from controls, including the asthenic, necro, terato, and leuko. (P. <0.05).

**TABLE5.**SEMINAL FLUID ABNORMALITIES AMONG STUDIED GROUPS.

| Abnormality | Patients | | P. value |
|---|---|---|---|
| | NO. | % | |
| **Azoospermia** | 14 | 22.6% | 0.061* |
| **Oligozoospermia** | 7 | 11.3% | 0.334* |
| **Asthenozoospermia** | 48 | 77.4% | **0.0001**** |
| **Necrozoospermia** | 38 | 61.3% | **0.0001**** |
| **Teratozoospermia** | 19 | 30.6% | **0.008*** |
| **Leukocytospermia** | 19 | 37.1% | **0.002*** |
| **Total** | 88 | 100.0% | |

* Fisher's Exact Test, ** Chi-Square Test

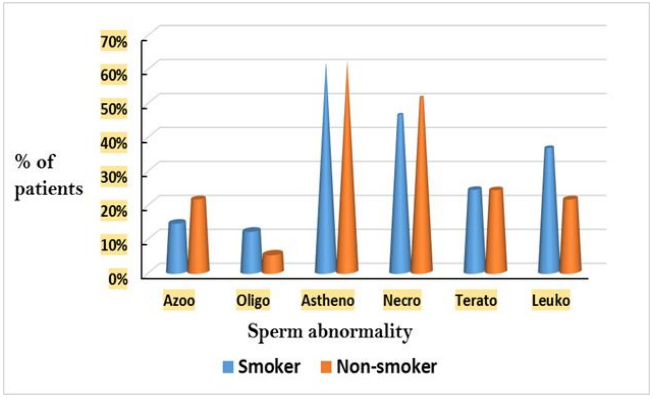
Table (6) clarifies that there was no significant statistical difference in age due to seminal fluid abnormalities.

**TABLE6.**SEMINAL FLUID ABNORMALITIES ACCORDING TO AGE GROUPS.

| | Age group | | | | | | Total | | P. value |
|---|---|---|---|---|---|---|---|---|---|
| | < 30 | | From 31 to 40 | | > 40 | | | | |
| | NO. | % | NO. | % | NO. | % | NO. | % | |
| **Azoo** | 7 | 17.9% | 7 | 23.3% | 0 | 0.0% | 14 | 17.9% | **0.278*** |
| **Oligo** | 5 | 12.8% | 2 | 6.7% | 0 | 0.0% | 7 | 9.0% | **0.622*** |
| **Astheno** | 26 | 66.7% | 17 | 56.7% | 5 | 55.6 % | 48 | 61.5% | **0.647**** |
| **Necro** | 20 | 51.3% | 15 | 50.0% | 3 | 33.3 % | 38 | 48.7% | **0.653*** |
| **Terato** | 9 | 23.1% | 8 | 26.7% | 2 | 22.2 % | 19 | 24.4% | **0.931**** |
| **Leuko** | 13 | 33.3% | 10 | 33.3% | 0 | 0.0% | 23 | 29.5% | **0.119**** |

*Fisher's Exact Test, ** Chi-Square Test

Figure (2) show seminal fluid abnormalities in smokers compared to nonsmokers,in whichthe largest group was found in patients with astheno and necro,and the smallest group was found in oligo patient. Another figure (3) shows seminal fluid abnormalities in patients who live in the central district compared to those who live in the peripheries; which largest group was also found in patients with astheno and necro, whereas the smallest group was also found in oligo patients. Therefore, comparing seminal fluid abnormalities according to smoking and residency, no




significant statistical differences were found (P. >0.05).
**Fig. 2.**Seminal fluid abnormalities according to the smoking habit.

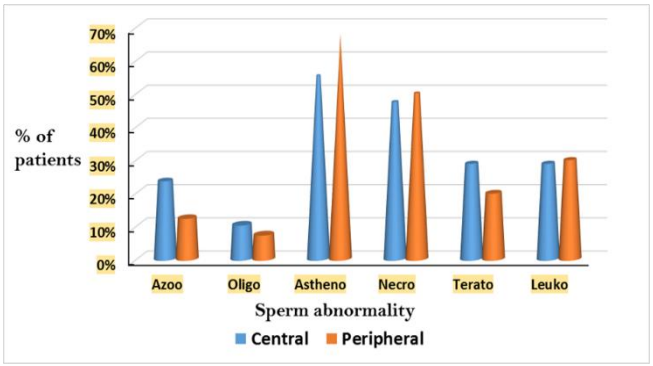



**Fig. 3.**Seminal fluid abnormalities according to residency.

## IV. Discussion

The distribution of patients and control were compared to each other according to age groups which were allocated into three groups. The first group (53.2%) of patients with age less than 30 years or younger is the study's most frequent age group. In the second group (38.7%) of patients with ages ranged 31-40, whereas in the last group, 8.1% of patients with ages more than 40 years, there were no significant statistical differences found (P. >0.05),this was in agreement with (Moridi et al., 2019; Okonofua et al., 2005) who was found age factor statistically not significant.

In addition, there are two other demographical factors smoking and residence. The distribution of patients and control groups were compared according to residency, divided into central (48.4%) and peripheral (51.6%). There were no significant statistical differences found (P. >0.05). This is agreed with (El-Helaly et al., 2010; Moridi et al., 2019). On the other hand, the smoking factor also allocated into a smoker (50.0%) vs. nonsmoker (50.0%) in the present study was also found not significant (P. >0.05), which disagrees with a previous study (El-Helaly et al., 2010) his finding was cases differed significantly from the controls that considered smoking significant risk factors of male infertility and agreed with this study (López et al., 2007)who was found Tobacco and alcohol intake did not seem to impact the quality of sperm significantly. These findings are comparable with those published by (Martini et al., 2004), who similarly found no variations in the quality of sperm among men who used alcohol or cigarettes.

The seminal fluid analysis results showed that The seminal pH was not had a significant difference between the two groups, which is the same result obtained by (Banjoko&Adeseolu, 2013), who found no significant differences were observed in the seminal plasma pH between the hypo motility and normal motility groups and also in similar with(Harraway et al., 2000)which also found the semen pH among the patients with normal sperm concentration and motility was not different from that among those with abnormal parameters. This result confirms that pH is not an influential factor in excessive increase or decrease, which was what (Zhou et al., 2015) concluded when culturing sperms in growth media with different pH gradients. Seminal fluid facilitates the actions of sperm by supplying energy and immunological protection, as well as contributing to motility, capacitation, transport, and fertilization capability. (Hopkins et al., 2017) The results obtained in this study were statistically highly significant, which agrees with the result obtained by a previous study that found a highly significant value between normal and abnormal semen parameters. Sperm count concentration was highly significant when compared between patients and controls, which agreed with the previous study (Ajah et al., 2016).Motility grades A and grade D were also highly significant. On the other hand, motility grades B and C were found not significant, which matchesthe result (López et al., 2007).

In addition, sperm morphology (normal and abnormal) was highly significant when compared between patients and control, which matches previous studies (Ajah et al., 2016).On the other hand, the leucocyte (WBC) result was also found not significant may be due to the low sample size, which disagrees with the previous studies (Ajah et al., 2016; Al-fahham et al., 2015)there finding WBC count are significantly higher in the infertile compared to the fertile control group.

Compared to the infertility type, the analyzed seminal fluid parameters were statistically insignificant in the present study, which agrees with the result (Gowri et al., 2010; Ibrahim & Ramzi, 2021). They concluded that the infertility duration, while also volume, sperm motility, sperm concentration, and aberrant forms of the semen, were not significantly different between the primary and secondary patients. the seminal fluid abnormalities which were divided into six groups that were found significantly statistically differs in patients from controls include the asthenozoospermia, necrozoospermia, teratozoospermia, and leukocytopenia. (P. <0.05) whereas the highest percentagewas found in asthenospermic patients, who disagreed with the result obtained by (Taha& Rashid, 2013; Wardah, 2018). Moreover, agree with the result (Ajah et al., 2016; López et al., 2007) who were found that the seminal anomaly that most frequently observed was asthenozoospermia which consisted of (36.7%) and (62.3%)respectively.

Primary infertility(N=61,34.6%) was more prevalent than secondary infertility(N=27,15.4%) in the study sample, which agrees with the result of(Ahmed & Othman, 2016). The infertility type (primary and secondary) compared with the duration of infertility was determined in the present study and divided into six groups where the largest group, 38.6%, ranged from 5-10 years. This may be related to the levels of education and income of the participant, which agree with the result (Moridi et al., 2019), which was found that 5-10 years was the highest group in patients with primary infertility and two years,5-10 years in patients with secondary infertility.

## V. Conclusion

Primary infertility was more prevalent than secondary infertility among the study sample. Infertility was not significantly associated with age, smoking, residence and duration, and infertility type. Seminal fluid parameters such as volume, sperm count, grade A, grade D, and sperm morphology of patients differ significantly from that of controls. Seminal fluid abnormalities were also significantly different in patients from controls such as the astheno, necro, terato, and leuko.

## Recommendation

Further Studies on the prevalence, incidence, and risk factors of male infertility in Basrah province.


## Acknowledgment

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