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ABSTRACT

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Materials and Method: A descriptive study was conducted on subject who attendants to Faiz medical lab and Mir Ansari clinic. They were interviewed, through separate questionnaires for everyone, from 2018 to 2019. Date was entered and analysed in SPSS software. Semen samples were collected in sterile tubes and then semen analysis was performed.

Keyworlds: mumps, smoking, urogenital, spermatogenesis, human, kabul.

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Result: A total of 300 attendants were interviewed. 292(97%) person were married, 8(2.6%) person were single. From 292 married 66(22.6%) person had child, 226(77.3%) person had not child. 63(21%) person of total were addict to tobacco, 237(79%) were not addict to tobacco. 26 person with history of mumps 6(23%) had normal spermogram, 20(76.9%) were abnormal. 63 person with history of UTI 15(23.8%) had normal spermogram, 48(76.2%) were abnormal. From 213 person who had abnormal spermogram, 73(73%) diagnosed Oligoasthenozooprima, 42(14%) person Asthenozoospermia, 36(12%) person Oligozoospermia, 28(9.3%) person Azoospermia, 15(5%) person prolongliquefection, 15 (5%) combination of aforementioned problems, 2 (0.6%) person Crptozoospermia, 1 (0.3%) person hyperspermia, 1(0.3%) person Teratozoospermia.

Conclusion: According these results it is conclude that smoking, Mumps and UTI have direct negative effect on spermatogenesis in Kabul.

Keyworlds: mumps, smoking, urogenital, spermatogenesis, human, kabul.

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I. INTRODUCTION

Inability of a couple to become pregnant after a year of sexual intercourse without contraception is called infertility.[1] Infertility is seen in ten to 15% of couples. Infertility can be divided into primary infertility (in which no previous pregnancy occurred) and secondary infertility (in which a previous pregnancy occurred even if it did not lead to the birth of a newborn).[2] The causes of infertility can be related to either a woman or a man or both. About 40% of infertility problems

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are related to men, 40% are related to women and about 10% relate to both.[3] Infertility has caused individual and social problems as one of the most important issues of couples and this is remarkable because the cause of male infertility is detectable in only 40% of cases, and in 60% of cases it is not recognizable as a paternal.[4] The patterns of infertility in developing countries are completely different from the advanced countries and the incidence of preventable infertility in developing countries is very high.[5] A study by the World Health Organization (WHO) found that 43% of women and 30.7% of men suffer from secondary infertility, most of which can be prevented.[6] Researches have shown that in non-smokers, the degree of intercourse is twice as high as semen, and that gravity in sperm quality is affected by its form and function.[7] According to studies conducted in other countries and regions, environmental factors can be among the factors affecting infertility in men, and in each region these factors are different and the effects of each of them are of particular importance.[8] Sperm is naturally produced in the man's testicles and ejaculates. If, in the following cases, a disorder occurs, it leads to infertility:

A) Pre-testicular factors: Endocrine system (hypogonadism, hypogonadotropic), sexual disturbances, erectile dysfunction (psychosocial, endocrine, neurological or vascular), and ejaculation disorder (psychosocial, genital, urinary, neurological, Drug related).[9-10]

B) Testicular factors: Genetics (Klein Fletcher's Syndrome, Y chromosome elimination), Congenital (Cryptorchidism), Infection (Orchitis), Antispermatogenesis factors (Heat, Chemo-therapy, Medication, Radiation), Vascular Factors (Vascular Torsion, Varicocele), immunologic and idiopathic factors.[11-12]

C) Post- testicular factors: Obstructive factors, epididymal (congenital, infections), related to seminal tubes (genetics: fibrosis-cystic, acquired: vasectomy) and undesirable epididymis (Epide-mic Asthenozoospermia).[13-14]

The average prevalence of infertility in different societies is 8-12%.[15] Some of its causes are physiological explanation and various factors, such as genetic disorders, are involved in their occurrence. But many environmental and actuarial factors are also effective in fertility and can cause infertility.[16]

Carlsen and colleagues In 1992, first reported a substantial fall in male fertility.[17] Carlsen data showed that a declination in sperm concentration worldwide i.e., 71.2 million/ml in Ibadan, Nigeria 54.6 million/ml in Lagos, Nigeria,[18] 65.0 million/ml in Salem, Libya[19], 66.9 million/ml in Dar Es salaam, Tanzania[20] and 57.4 million/ml in Copenhagen, Denmark.[21] According to Danish's research result the proportion of abnormal sperm increasing from 40% to 59% between 1966 and 1986.[22] Furthermore, a study at the Reproduction Biology Laboratory of the University Hospital of Marseille (France) between 1988 and 2007, which included semen analysis of 10,932 male partners of infertile couples concluded that the whole population demonstrated the declining trends in sperm concentration (1.5%/year), total sperm count (1.6%/year), total motility (0.4%/year), rapid motility (5.5%/year), and normal morphology (2.2%/year). Also, in the group of selected samples with total normal sperm count, the same trends of sperm quality deterioration with time were observed.[23] The studies conducted in Indian perspective also showed a qualitative and quantitative defect in the sperm production and declination in sperm count approximately, 30% to 40% men in reproductive age group.[24] Studies conducted in Indian prospective have reported 57%[25] and 19%.[26] Our earlier study conducted for the infertile male of Jaipur, Rajasthan, and study reveals that prevalence of maximum number of infertile males was azoospermic (35%).[27] The prevalence of azoospermia and oligozoospermia in the metropolitan cities of Mumbai, Bangalore and Jalandhar were similar to those reported in most other parts of the world.[28-29] A study conducted by Mehta et al.[30] had documented that prevalence's of azoospermia in Kurnool and Jodhpur,

respectively, was 38.2% and 37.3% incidences of azoospermia. In this respect the presence of azoospermia in Jaipur was within range, as reported in Indian perspectives, but higher than those reported from other part of the world.[25,26,31-34] Tobacco smoke is deleterious to reproduction. Benzo[a]pyrene (B[a]P) is a potent carcinogen in cigarette smoke. Its reactive metabolite adducts with DNA, which can result in mutations.[35] This can result in both male and female infertility. According to a report, heavy smokers had 19% lower sperm counts than non-smokers.[36] Ji et al.[37] found that the more a man smokes prior to his wife's conception, greater will be the risk the child will have for developing cancer by the age of five years. It has been indicated that exposure of spermatozoa from non-smokers to the seminal plasma of smokers yields a significant reduction in the sperm motility, acrosome reaction and elevated MDA[38]. Waylen et al.[39] provided in their meta-analysis evidences for a negative effect of smoking on clinical outcomes of intracytoplasmic sperm injection success (clinical pregnancy) in women with smoking and non-smoking partners (22% vs. 38%). However, Rybar et al.[40] failed to confirm a relationship between smoking and sperm quality in men from any of the investigated groups. Infections of the male reproductive tract is a common disease that can deteriorate the quality of spermatozoa and impair the function of male accessory gland; for this reason it is considered one of the potentially correctable causes of male infertility. Infection of the male reproductive tract significantly decreases the levels of semen volume, α-glycosidase, fructose and zinc in seminal plasma suggesting impairment of the secretary function of the epididymis, seminal vesicles and prostate.[41] The aim of this study was to investigate some of the factors such as smoking, history of Mumps, UTI on infertility in men referred to Faiz Lab and Mir Ansari Clinic.

II. MATERIALS AND METHODS

This cross-sectional descriptive study was carried out on male of infertile couple referred to diagnostic centers in Kabul in August 2018 and May 2019. Sampling was done purposefully in two health centers in Kabul, namely: Fayz laboratory and Mir Ansari clinic. At first, after filling consent form, a questionnaire was filled include demographic characteristics of patients (such as: Age, occupation, province, civic status, having a child, duration of marriage, smoking, type of exercise, history of disease). After collecting samples, the samples were examined for the parameters of classical sperm. These parameters included volume, colour, viscosity and time of liquefaction, PH, sperm counts, sperm motility, Viability and morphological evaluation. This trial was performed on (300) people aged between 20-65 years old. The data were analysed recently by the SPSS software.

The entry criteria for the study were submitted to the study based on the written consent provided. Samples of the subjects who were referred to the laboratory were tested. However, following the instructions for avoiding sexual intercourse for at least 3 days, the sample was self-ejaculated in sterile containers. After received the semen in the laboratory, the sample was kept at 37 °C for 20 minutes in the incubator for liquefaction. Then the semen analysis steps took place. Individuals who had sperm inspections were included our research after completing the questionnaire and signing consent. The exclusion was individuals, who did not accept the consent, bring their semen sample from their home or did not follow our guidance.

III. SEMEN ANALYSIS

Semen analysis was performed manually according to the WHO standard guidelines. In semen microscopic studies, concentrations, count, morphology and motility were studied. The sample is first 10 µl drawn by micropipette and placed on a slide. Next, it is covered by a 22×22 mm glass lemel. All test steps should be carried out at 37 °C. According to the WHO standard guidelines[42] we considered below checklist for describe normal spermogram:

- ☐ Volume: 1.5 mL (95% CI: 1.4-1.7)
- ☐ Sperm concentration: 15 million spermatozoa/mL (95% CI:12-16)
- ☐ Total sperm number: 39 million spermatozoa per ejaculate (95% CI: 33-46)
- ☐ Morphology: 4% normal forms (95% CI: 3-4)
- ☐ Vitality: 58% live (95% CI: 55-63)
- ☐ Progressive motility: 32% (95% CI: 31-34)
- ☐ Total (progressive+nonprogressive motility): 40% (95% CI: 38-42)

Ethical issues:

The study was approved by the Institutional Ethics Committee of Kateb Medical Research Center (AFG.KMRC.REC.1398.35).

IV. RESULTS

In this study, 300 cases were studied, 208 from the capital of the country (Kabul) and 92 from the provinces. Their age varied from 20 to 65 years, with an average age of 42 years. Out of the 300 studied subjects, 63 were addicted (cigarette, hookahs, Naswar), and 237 had no addiction. From 63 people who were addicted, 58 people were used to cigarettes, 2 hookahs, 3 Naswar (Chart 1). From 58 people who were addicted to cigarettes, 12 had normal spermogram and 46 had abnormal spermogram (Chart 2).

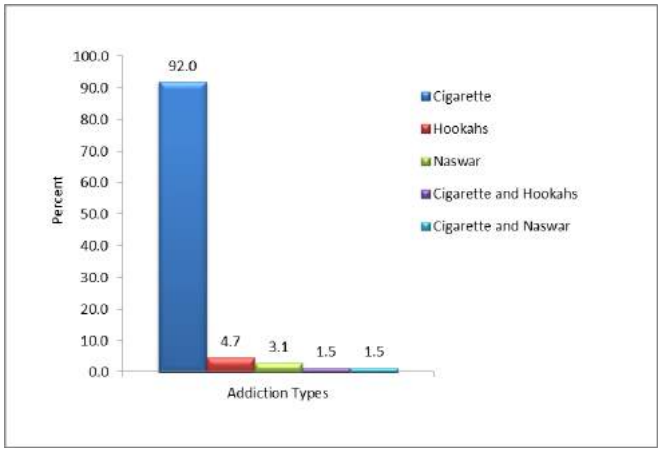

Chart 1: The percentage of addiction types in individuals with addiction

For the 300 patients surveyed, 26 had a history of mumps and 274 had no history of mumps. There were 26 people who had mumps, 6 of them had normal spermogram, and 20 were abnormal spermogram (Chart 2). In terms of the history of UTI (300) patients, 63 had UTI history and 237 had no history of UTI. Of the 63 patients with UTI history, 15 had normal spermogram and 48 had abnormal spermogram (Chart 2).

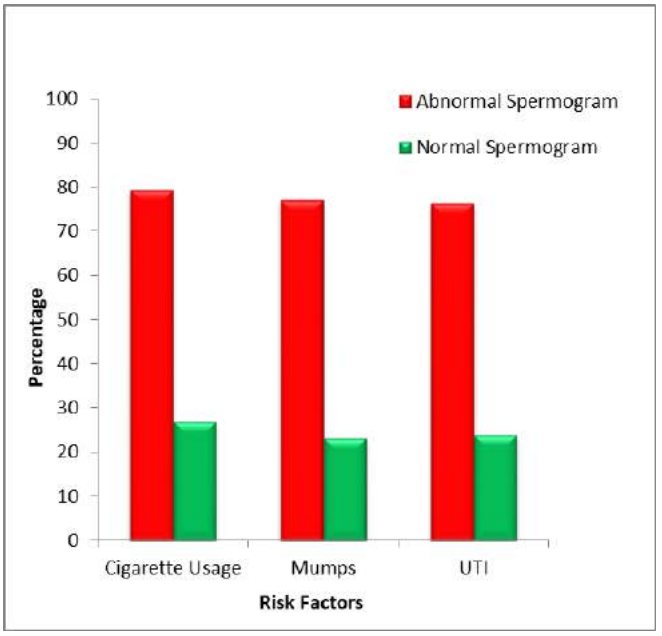

Chart 2: The percentage of quality of spermatogenesis in different risk factors include: Cigarette usage, Mumps and UTI.

From 300 people who were tested for spermogram, 87 were normal and 213 were abnormal. Out of 213 abnormal individuals, 73 were Oligoasthenozoospermia (low motility and low sperm count), 42 cases of Asthenozoospermia (low sperm motility), 36 cases of Oligozoospermia (low sperm count), 28, Azoospermia (without any sperm), 15 Prolonged Liquefaction (long time period to semen liquefaction), 15 combination problems, 2 People with Cryptozoospermia (severe low sperm count), one person Hyperspermia (meaning large volume of fluid in the semen) and one Teratozoospermia (sperm with morphology of abnormal) (Chart 3).

In sperm parameter analysis, we compared 4 parameters in different groups (Chart 4). Our findings showed that sperm count variable in cigarette usage, Mumps, UTI groups were (80 ×

10^6/ml), (95 × 10^6/ml) and (73 × 10^6/ml), respectively. This difference wasn't significant (P>0.05). Motility variable in cigarette usage, Mumps, UTI groups were 60%, 53% and 41%, respectively. This difference wasn't significant (P>0.05). Normal morphology variable in cigarette usage, Mumps, UTI groups were 25%, 31% and 21%, respectively. This difference wasn't significant (P>0.05). Viability variable in cigarette usage, Mumps, UTI groups were 65%, 52% and 48%, respectively. This difference wasn't significant (P>0.05).

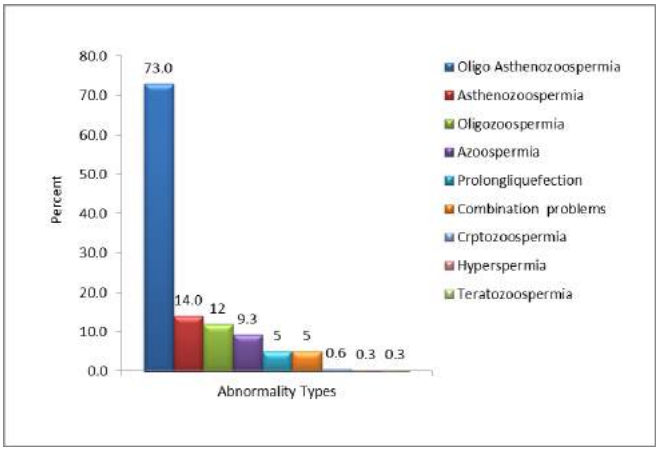

Chart 3: The percentage of abnormalities kinds between abnormal spermogram in 3 risk factors include: Cigarette usage, Mumps and UTI.

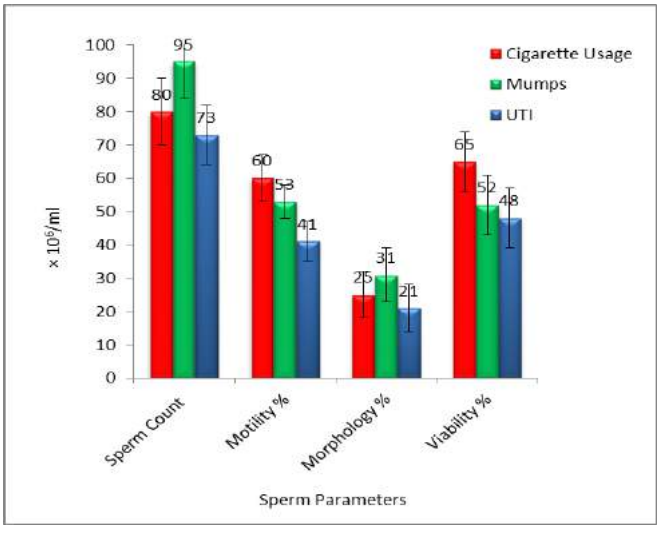

Chart 4: Comparison of sperm parameters in semen samples collected from different groups (Cigarette usage, Mumps and UTI). Values are expressed as mean ± standard deviation.

V. DISCUSSION

In this study, 300 individuals were studied whose age range was 20-60 years old. One of the most important factors involved in identifying the fertility status of an infertile couple and also choosing the most appropriate treatment method is the semen analysis.[43] This experiment, which has been studied and investigated several years ago, has been considered especially because of the choosing of assisted reproduction treatment (ART) is usually based on the outcome of semen analysis. In this regard, the WHO has also provided a guideline to semen analysis and sperm parameters.[42] The ethology of infertility are varies according to the different geographical, health and cultural conditions in different parts of the world.[44] Determining the factors affecting infertility among different countries is very important in terms of geographical conditions. The present study was conducted with the aim of investigating individual characteristics such as age, occupation, education, consumption of cigarettes and history of the disease and their relationship with infertility. Based on the results, there was a relationship between factors such as cigarette smoking and previous illness (UTI and Mumps) with sperm parameters in infertile men. One of the most important causes of infertility in men is genital herpes and urinary tract infections.[45] In most cases, this infection disrupts parameters such as number, motility, viability and morphology of sperm, as well as inflammation of the epididymis and prostate.[46] The main effect of the cigarette usage on sperm parameters remains obscure.[39] Evidence suggests that the effect of cigarettes on spermatozoa is the effect of blood circulation on testes as well as its effect on sertoli and leydig cells.[47] Benzo[a]pyrene (B[a]P) is a potent carcinogen in cigarette smoke. Its reactive metabolite adducts with DNA, which can result in mutations.[35]

Orchitis is considered the most common complication of mumps infection in the adult male. This inflammation usually follows parotitis but may precede or occur in the absence of

parotid gland swelling. Orchitis usually appears during the first week of parotitis, but it can occur in the second or third week. Bilateral orchitis occurs less frequently (about 10% of cases). Gonadal atrophy may follow orchitis and poses a greater risk with bilateral involvement; however, sterility is rare.[48] The exact mechanism by which the mumps virus elicited anti-sperm antibodies is unknown, although animal models have shown that acute orchitis may be a causative factor in anti-sperm antibody production.[48] Antibodies against sperm can prevent their motility through the female reproductive tract or prevent the process of fertilization.[49]

The majority of infertility patients with signs of urogenital tract infections/inflammations are asymptomatic, suggesting a high rate of chronic disease.[50, 51] In these cases; the diagnosis is primarily based on the detection of the pathogen, increased white blood cell counts and/or inflammatory mediators in ejaculate, prostate secretion and urine samples. Since a compartment-specific differential diagnosis is challenging, abnormal findings are typically summarized under the term "male accessory gland infection (MAGI), according to the definition of the WHO.[52] The lack of differentiation between infection and inflammation is of concern, as inflammatory reactions not primarily related to a pathogen may also occur.[53] Another problem is that asymptomatic testicular inflammatory reactions are not covered by the WHO criteria.[50] Therefore, the potential impact of urogenital infections on male fertility and its management remains the subject of controversy.[54]

VI. CONCLUSION

This study showed that most of the patients had a lot of abnormalities due to semen analysis. Our results showed that smoking, mumps and UTI have direct negative effects on sperm quality. According to our limitation to done this research in all of Kabul, we suggest that to exact determination we must done this research in more centers in Kabul in the future.

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Ethical disclosures Protection of human subject

The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Declaration

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Conflict of interest: We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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