

# Clinical Urogenital Anomalies Responsible for Primary Male Infertility Presenting in Infertility Clinic

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## ABSTRACT

**Aim:** To determine the frequency of clinical urogenital anomalies responsible for primary male infertility presenting in infertility clinic.

**Study design:** Descriptive cross sectional study.

**Place and duration:** Department of Urology, Gajju Khan Medical College, Swabi from 1<sup>st</sup> July 2019 to 31<sup>st</sup> December 2019.

**Methods:** One hundred and eighty six patients who are selected between age groups 15-50 years. All patients meeting the inclusion criteria were included in the study through OPD. The purpose and benefits of the study was explained to the patients and a written informed consent was obtained. All the patients were worked up with complete history, clinical examination and investigations to rule out confounders and bias in the study results. All the follow ups were done by the researcher himself and all the above mentioned information including name, age and gender address was recorded.

**Results:** Minimum age of patient was 17 years and maximum age was 50 years. Mean age was 35±4.5 years. Age group 21-30 years contained highest no of patients, which was 71 (38.17%) and second most frequent group was 31-40 years which contains 55 (29.5%) patients. Most frequent anomaly was varicocele, which was present in 45 patients, which was 24% of total. Second anomaly was hydrocele which was found in 26 (14%) patients and the least anomaly was hypogonadism found in 9 (5%) patient.

**Conclusion:** Among urogenital anomalies with which patients present to infertility clinics, varicocele was the most common cause, however further studies should be done on larger scale to see the relation between these anomalies and infertility. Studies should also be done on genetic and hormonal factors, which are the most frequent cause.

**Keywords:** Infertility, Varicocele, Cryptorchidism, Hypospadias, Urogenital anomalies

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## INTRODUCTION

According to World Health Organization 'Infertility is the inability of a couple in the reproductive ages to achieve pregnancy following twelvemonths of regular, unprotected intercourse<sup>1</sup>. About 84% of couples in general population are expected to conceive within one year and about 92% should conceive within two years.<sup>2</sup> Infertility affects 15% of all couples, in which approximately half are due entirely to the female factor, 20% due to the male factor and the remaining 30% involving a combination of both.<sup>3</sup> The increase in male infertility however has become a source of global concern<sup>3,4</sup>. Approximately 8% of men of reproductive age seek medical attention for infertility problems. Of these, up to 10% present with a reversible cause affecting their fertility potential. The causes of male infertility are widely varied, and are best evaluated by an expert in male reproductive health. Some causes of male infertility can be identified and reversed (or improved) with specific surgery or medication, while other causes can be identified but not reversed. Varicocele accounts for, 35% of cases of primary male infertility and is considered to be the most common cause of male infertility<sup>5</sup>.

The etiology of impaired sperm production and function can be related to factors acting at pre-testicular, post-testicular or directly at the testicular level<sup>1,4</sup>. According

to Csilla Krausz primary testicular failure accounts for about 75% of all male factor infertility, genetic factors can be identified in about 15% of cases (congenital hypogonadotropic hypogonadism, congenital absence of vas deferens, primitive testicular failure). Despite progresses, mainly in the field of genetics, the etiology in infertility due to genetic causes is still unknown in about 50% cases and it is termed "idiopathic infertility"<sup>6</sup>.

According to a study by Sandro presentation of male patients to infertility clinic are varicocele 26%, obstruction 15%, cryptorchidism 14%, testicular failure 14%, idiopathic 12%, genetic defect 7.9%, infectious 3%, hormonal and immunological problems 2.3%, ejaculatory dysfunction 1.2% and cancer 0.5%.<sup>7</sup> The frequency of chromosomal aberrations in the general population is approximately 0.6%. However, karyotype abnormalities are reported in 2%–14% of males presenting with infertility<sup>8</sup>.

For some men, one or two failures during intercourse begin a vicious cycle of fear of failure, with anxiety leading to further failures. Partners may also develop arousal difficulties because of anxiety or distress<sup>8,9</sup>. Erectile dysfunction which is one of the causes of infertility may be due to psychological or physical stress<sup>9</sup>. The stress of the non-fulfillment of a wish for a child has been associated with emotional sequel such as anger, depression, anxiety, marital problems and feelings of worthlessness. Partners may become more anxious to conceive, ironically increasing sexual dysfunction and social isolation<sup>9</sup>. Marital discord often develops in infertile couples, especially when

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they are under pressure to make medical decisions. Couples experience stigma, sense of loss, and diminished self-esteem in the setting of their infertility<sup>10</sup>.

The aim of this study is to determine the most prevalent urogenital anomalies responsible for primary male infertility in our population, so that couples can be educated about infertility and to highlight the common treatable causes of infertility, so that prompt measures could be initiated for them.

## MATERIALS AND METHODS

The descriptive cross-sectional study was conducted at Gajju Khan Medical College, Swabi from 1<sup>st</sup> July 2019 to 31<sup>st</sup> December 2019. One hundred and eighty six were included. All male patients with diagnosis of infertility more than six months and age group 15-50 years were included in the study. All cases with incomplete information (e.g. medical history, social history and occupation) required and those patients who could not complete their investigations (e.g. full blood count, seminal fluid analysis, pelvic ultrasonography) were excluded. The above mentioned conditions act as confounders and if included will introduce bias in the study results. The study was conducted after approval from hospitals ethical and research committee. All patients meeting the inclusion criteria were included in the study through OPD. All the patients were worked up with complete history, clinical examination and investigations to rule out confounders and bias in the study results. All the procedures were done by the researcher himself and all the above mentioned information including name, age and gender address was recorded. Data was analyzed using SPSS version 20.

## RESULTS

Minimum age of patient was 17 years and maximum age was 50 years. Mean age was 35±4.5 years was calculated. Age was divided into 4 groups for sake of simplicity and understanding. Age group 21-30 years contained highest no of patients, which was 71 (38.17%) and second most frequent group was 31-40 years which contains 55 (29.5%) patients (Table 1).

Most frequent anomaly was varicocele, which was present in 45 patients, which was 24% of total. Second anomaly was hydrocele which was found in 26(14%) patients and the least anomaly was hypogonadism found in 9 (5%) patient (Table 2, Fig. 1).

Table 1: Age distribution (n=186)

Age (years)	No.	%
15-20	25	13.44
21-30	71	38.17
31-40	55	29.56
41-50	35	18.8

Table 2: Urogenital anomalies presented with infertility distribution

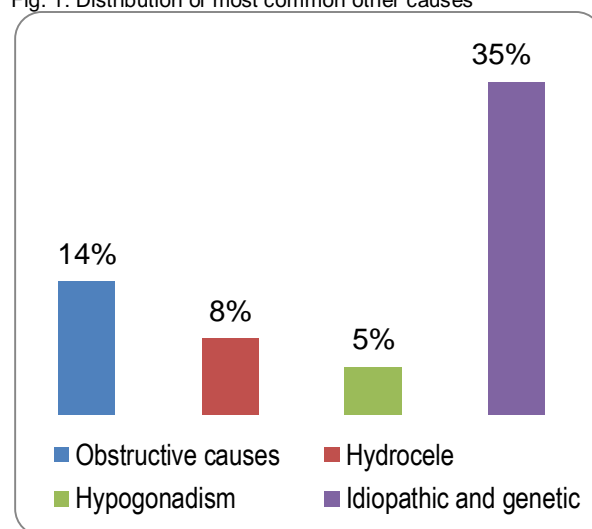
Age (years)	No.	%
Varicocele	45	24.0
Cryptorchidism	15	8.0
Hypospadias	11	6.0
Others (obstructive causes, hydrocele, hypogonadism & idiopathic & genetic causes)	115	62.0

Table 3 showed the urogenital anomalies were stratified among duration of infertility and shows P = 0.0439, which shows that there is statistically significant difference is present in urogenital anomalies being presented more with duration of infertility category.

Table 3: Stratification of urogenital anomalies among duration of infertility

Anomalies	Duration of infertility (years)		
	<5	5-15	>15
Varicocele	16	27	10
Cryptorchidism	9	7	4
Hypospadias	4	4	6
Others (obstructive causes, hydrocele, hypogonadism& idiopathic & genetic causes)	16	53	30
Total	45	91	50

Fig. 1: Distribution of most common other causes



## DISCUSSION

Male infertility refers to a male's inability to cause pregnancy in a fertile female and affects approximately 7% of all men.<sup>11</sup> Male infertility is commonly due to deficiencies in the semen and semen quality is used as a surrogate measure of male fecundity<sup>12</sup>.

An estimated 10-15% of couples are considered infertile, defined by the World Health Organization (WHO) as the absence of conception after at least 12 months of unprotected intercourse. In American men, the risk correlates to approximately 1 in 25. Low sperm counts, poor semen quality, or both account for 90% of cases; however, studies of infertile couples without treatment reveal that 23% of these couples conceive within 2 years, and 10% more conceive within 4 years. Even patients with severe oligospermia (<2 million sperm/mL) have a 7.6% chance of conception within 2 years<sup>13</sup>.

Varicocele incidence in the general male population is roughly 15% by physical examination, and this increases to 35-40% in men with primary infertility and up to 75-81% in men with secondary infertility because of the progressive testicular damage of varicocele on seminiferous tubules and hence spermatogenesis.<sup>14,15</sup>

In our study incidence of varicocele was 24%. Out of which highest age group in which it occurs is 21-30 years ( $p = 0.00$ ). The second most common age group was 31-40 years. In another studies incidence of varicocele was 14%<sup>16,17</sup>.

In the World Health Organization study, the incidence of varicocele was 25.4% in men with abnormal semen and 11.7% in men with normal semen<sup>18</sup>.

The relevant theories to the pathogenesis of varicocele and associated male infertility are scrotal hyperthermia, hormonal dysfunction, increased or decreased testicular blood flow rates, reflux of renal or perirenal toxic metabolites, testicular venous hypertension, and hypoxia of the tubuloseminiferi secondary to venous stasis<sup>19</sup>.

Cryptorchidism is a common birth defect regarding male genitalia. In unique cases, cryptorchidism can develop later in life, often as late as young adulthood. About 3% of full-term and 30% of premature infant boys are born with at least one undescended testis.

In our study patients having cryptorchidism were 8% of total sample size, in which 80% were have cryptorchidism on left side and 20% on right side. However, about 80% of cryptorchid testes descend by the first year of life (the majority within three months), making the true incidence of cryptorchidism around 1% overall<sup>20</sup>.

Hypospadias are among the most common birth defects of the male genitalia (second to cryptorchidism), but widely varying incidences have been reported from different countries, from as low as 1 in 4000 to as high as 1 in 125 boys.<sup>21</sup> Due to variations in the reporting requirements of different national databases, data from such registries cannot be used to accurately determine either incidence of hypospadias or geographical variations in its occurrences<sup>22</sup>.

In the present study hypospadias occur in about 6% of patients in which most common age group that was affected is 41-50 years ( $p = 7.46$ ). Most common type of hypospadias was distal-anterior = 70%, intermediate = 20% and proximal-posterior=10%.

In 8% of hypospadias there was associated cryptorchidism, in 12% inguinal hernia and in 80% congenital penile curvature as well.

After stratification of urogenital anomalies among age groups it was evident that these defects are more prevalent in aged patients range from 28-45 years and likewise increase with age.

Aging has an indirect effect in relation to mutations on the X chromosome which are passed to daughters at risk for having sons with X-linked diseases. A 2009 review focusing on the effect to children said that the absolute risk for genetic anomalies in offspring is low, and concludes there is no clear association between adverse health outcome and paternal age but longitudinal studies are needed<sup>23</sup>.

In 1912, Wilhelm Weinberg, a German physician, was the first person to hypothesize that non-inherited cases of achondroplasia could be more common in last-born children than in children born earlier to the same set of parents<sup>22</sup>. Although Weinberg "made no distinction between paternal age, maternal age and birth order in his

hypothesis, by 1953 the term "paternal age effect" had occurred in the medical literature on achondroplasia.<sup>24,25</sup>

A review of the literature by Kidd et al determined that older men had decreased pregnancy rates, increased time to pregnancy, and increased subfecundity (i.e. infertility of a couple at a given point in time).<sup>26</sup> Increasing paternal age may also increase the risk of reproductive failure, which has led some researchers to compare age 40 to the "Amber Light" in a man's reproductive life.<sup>27</sup>

## CONCLUSION

Among urogenital anomalies with which patients present to infertility clinics, varicocele was the most common cause, however further studies should be done on larger scale to see the relation between these anomalies and infertility. This should also be done on genetic and hormonal factors which are the most frequent cause.

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