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DETECTION OF MALE INFERTILITY: IMPLICATION OF EXTERNAL GENITALIA EXAMINATION

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ABSTRACT:

Objective: To establish that the external genitalia examination without help of other investigations has no significance in diagnosing male infertility.
Methodology: Total number of subjects was 61, in which nineteen subjects were placed in fertile group and 42 subjects in infertile group. Both groups were compared for any possible differences of external genitalia examination by performing chi-square test. Diagnostic accuracy of external genitalia examination was also quantified by its measures such as sensitivity, specificity, predictive values and diagnostic odds ratio.
Results: After performing chi-square test, difference in external genitalia examination among Fertile and Infertile group was found non-significant ($p>0.05$) ($x^2=2.66$), as well as poor diagnostic accuracy of external genitalia examination was established by its measures.
Conclusion: External genitalia examination does not discriminates between fertile and infertile male subjects alone so that general practitioners should investigate serum hormones initially and should be referred to specialist infertility clinic for further evaluation. However studies on larger population with this approach are warranted.

Key words: Male Infertility, Genital Examination, Diagnostic Accuracy.

INTRODUCTION

Infertility is common, and it's not hard to find among friends, relatives or other acquaintances with such problems. About one in six, couples experience difficulty in achieving conception at some stage during their reproductive years and there are about 60– 80 million infertile couples world-wide[1]. According to WHO it is defined as the inability of a sexually active, non-contracepting couple to achieve pregnancy in one year[2]. Infertility is said to be primary if the couple have had no previous pregnancy and secondary if there has been at least one pregnancy irrespective of its outcome like miscarriage, ectopic pregnancy and preterm or term delivery.

The male partner is solely responsible in 40% of infertility cases while the female partner is responsible for another 40% while both are responsible for the remaining 20% of cases[1]. There is a substantial body of evidence suggesting that human semen is getting poorer with the passage of time. Sperm concentration is decreasing and the numbers of defective sperm as well as other male pathologies are increasing. Reports of declining sperm counts and increasing incidence of urogenital abnormalities have aroused public concern[3]. The World Health Organization currently recommends 1.5 ml, 15 million sperm per ml, 40% total motility and 4% normal morphology as lower reference limit of semen analyzed according to the methods described by WHO[4,5].

Endocrine disturbances, urogenital abnormalities, varicocele, genital tract infections, genetic abnormalities and immunological factors are the major causes of male infertility[6]. Men presenting with infertility with no past history and normal investigations are categorized

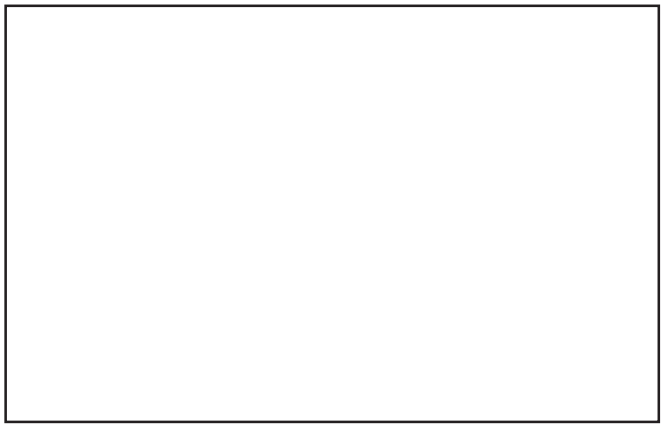
as 'idiopathic infertile'. Idiopathic infertility may be caused by several factors, such as chronic stress, endocrine disruption due to environmental pollution, reactive oxygen species and genetic abnormalities[2]. Treating idiopathic male infertility with drugs is usually ineffective and may require expensive assisted reproduction techniques[2] like artificial insemination at first which is a valid low cost method, minimally invasive and with rare complications[7].

To evaluate male partner for infertility, full clinical examination is essential including male genitals. Penis, prepuce, external urethral meatus, testicles, epididymis and vas deferens are the usual components of male genital examination[8]. Usually provisional diagnosis is made after the end of clinical examination which is then followed by investigations to establish the clinical diagnosis. It is advised to start investigations of infertile couples after 1 year of sexually active non-contracepting couple or after 6 months if the female partner is more than 35 years of age or immediately if there is an obvious cause for their infertility[9]. It is also suggested not to prescribe drugs if the cause of infertility could not be assumed from the history taking and clinical examination until all basic investigations are done. Chances of pregnancy increase[8] by simply referring male infertile to specialist infertility clinic primarily, if there is history of genital pathologies like uro-genital surgery, STD's, varicocele, cryptorchidism, systemic illness, chemotherapy or radiotherapy; abnormal findings on genital examination and if the results of any of the 2 semen analyses, 10 to 12 weeks apart found below WHO criteria[10].

During a questionnaire survey of general practitioners carried out as part of a national infertility audit in Scotland[11], eighty-nine per cent agreed that there should be local guidelines for the investigation, management, and referral of infertile patients and only thirty-eight percent agreed that a genital examination of both partners and general examination of both partners should be performed by the general practitioners. Alarmingly only 27% currently follow such guidelines, forty-one per cent usually perform a full examination of both partners and twenty-seven percent do not think examination of either partner is necessary in general practice. Unfortunately we have no such data in Pakistan and no related local literature was found after extensive survey, but can predict the outcome implicitly.

With this background this study was planned to test the hypothesis (H_0) that the external genitalia examination without help of other investigations has no significance in diagnosing male infertility. To prove our hypothesis we have measured chi-square test and tried to quantify the diagnostic accuracy by its measures like sensitivity, specificity, predictive values and diagnostic odds ratio as done by other studies[12,13] tried to assess diagnostic accuracy of physical examination in other conditions.

FIGURE: I
DISTRIBUTION OF FERTILE AND INFERTILE SUBJECTS ON THE BASIS OF THEIR SEMEN ANALYSIS



METHODOLOGY

The present study was designed as a descriptive study showing significance of external genitalia examination in normal fertile and infertile males. Case controlled convenient sampling was used to assess infertile male subjects from fertile. Total of sixty-one male subjects selected, forty two primary infertile without treatment age ranging between 20 to 40 years were included. Nineteen fertile subjects who came for vasectomy voluntarily at Infertility Clinic, RHS-A Centre, Jinnah Postgraduate Medical Centre, Karachi were also included in the study and the samples were taken before the procedure. Subject's undergone pelvic surgery, diabetes mellitus, thyroid diseases and subjects using steroids, antihypertensives and antipsychotics were excluded from the study.

Semen samples were obtained by masturbation after 3 to 5 days of sexual abstinence. After 30 min of liquefaction at room temperature, semen analysis was done immediately. Semen analysis was interpreted for its volume, sperm count, motility, and morphology according to the WHO reference values[4].

RESULTS

The total of sixty-one subjects was selected. All the subjects were distributed into two main groups Fertile (control) and Infertile on the basis of history, examination, and semen analysis according to WHO guide lines[4]. Nineteen subjects were placed in fertile group and 42 subjects in infertile group. The distribution of infertile group on the basis of their semen analysis is shown in figure. I. On external genitalia examination, presence of varicocele was found in 2(4.76%), undecended testis in 2(4.76%), smaller size testis in 1(2.38%), and retractile testes in 3(7.14%) infertile subjects. On the whole normal fertile group had no abnormal findings, where as only 19% of infertile have significant abnormal findings on external genitalia examination. After performing chi-square test, difference in external genitalia examination among Fertile and Infertile group was found non-significant ($p>0.05$) ($x^2=2.66$) represented in table I. Where as poor diagnostic accuracy was found represented by its measures in table II.

DISCUSSION

There has been a steady progress in recent decades in the treatment of infertility and several thousand babies have now been delivered world-wide following the birth of the first Test-Tube baby in 1978. Treatment could be by the medication, surgery, assisted conception treatment or any of the suitable combination. But in our part of world a large proportion of infertile couples often avoid specialist consultations because they perceive infertility as a threat to their masculinity and or have no access to expensive treatments and are on the mercy of general practitioners.

At present the initial evaluation of male infertility mainly includes examination of external genitalia and seminal fluid. To date no physical or biochemical indexes reliably predict fertility, probably

TABLE: I
CONTINGENCY TABLE FOR COMPARING EXTERNAL GENITALIA EXAMINATION AMONG INFERTILE AND FERTILE SUBJECTS

Examination	Infertile	Fertile	X^2
Abnormal	8 (19%)	0	2.66^{NS}
Normal	34 (81%)	19 (100%)	

NS = Non-significant difference in External Genitalia Examination among Fertile and Infertile group p>0.05. Using Chi-square test (x^2=2.66).

TABLE: II
DIAGNOSTIC ACCURACY OF EXTERNAL GENITAL EXAMINATION

Sensitivity	19 %
Specificity	0%
Positive Predictive Value (PPV)	0%
Negative Predicted Value (NPV)	35.8%
Efficacy	44.2%
Diagnostic Odds Ratio (DOR)	0.235

because many metabolic aspects of sperm cells remain obscure. In our study 81% of the infertile males had no abnormal findings on the external genitalia examination in a local population. This observation is in agreement with the study conducted at Lady Reading Hospital Peshawar, Pakistan by Wazir et al.[14] which also showed only 15.9% of male infertile had small atrophic testes and 3.5% patients were having varicocele of different grades on clinical examination. Same pattern was observed by studies conducted by Mania-Pramanik et al.[15] and Greendale et al.[16] which showed that 50 to 60% of male partners had no signs and symptoms on history as well as on genital examination instead of having Chlamydia trachomatis infection. Previous studies also suggested that Chlamydia Trachomatis is a common cause of urethritis[17, 18] and may cause infertility[16,19,20].

Demonstration of the diagnostic accuracy of external genital examination was attempted in the study by its specific measures. Due to low sensitivity and zero specificity, potential of external genital examination to recognize infertile and normal fertile subjects is very poor. There is zero probability of having infertility in a subject with normal genitalia examination and low probability of not having infertility in a subject with an abnormal genitalia examination. Proportion of correctly identified infertile subjects among all subjects was also found to be only 44%. To observe the discriminative power of external genitalia examination DOR was applied which showed that this diagnostic procedure can not be used alone to differentiate between fertile and infertile subjects. These results are not comparable as no such study was found on extensive literature search.

However the results of our study may also suggest the prevalence of idiopathic male infertility in local population which is in accordance with the available WHO[6] data which shows approximately 75% among 7,057 men comprises of idiopathic infertility with no demonstrable cause. Where as only 28% of the patients were diagnosed as idiopathic infertile among 1000 infertile patients presented at the in-vitro fertilization unit at the university hospital Freiberg, Germany, but it still remains the largest fraction[21]. Due to limitations of this study, finding of this study warrants careful interpretation and further study on a larger population is recommended, which is predictable to confirm these results.

CONCLUSION

The results of this study suggested that the external genitalia examination alone do not discriminates between fertile and infertile male subjects and can not be used as a diagnostic tool to evaluate the cause in all patients. Therefore the implication of this finding is that general practitioners should not rely on external genitalia examination alone, for diagnosing male infertility but should also investigate further with the help of semen analysis, serum hormone levels and scrotal ultrasonography[22, 23]. For improvement, evidence-based, local guidelines for the investigation, management, and referral to specialist infertile clinics for infertile patients should be formulated.

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