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Male infertility is a common and significant problem

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Abstract

Infertility is the inability to achieve the desired pregnancy for a period longer than a year, and exists as female or male infertility. Often, infertility is the result of a combination of male and female health problems. Although infertility is more often mentioned as a female problem, in even 30% of infertile couples the cause lies in sperm irregularities, so male infertility is actually a common and significant problem.

Keywords: Infertility, male, female, varicocele, diagnosis, health

Introduction

The male has been overlooked within the appraisal of his fertility, with maybe as well much accentuation having been put on the semen investigation [1]. A clear determination of the cause of male calculate infertility can be made in as it were a little extent of men who display with infertility. Numerous of these men are named as having idiopathic male figure infertility for which there are no particular therapies. Indeed, a overview a number of a long time back of more than 7,000 men with male figure infertility uncovered that there was no identifiable cause in 48.5%, idiopathic anomalous semen in 26% (12% oligozoospermia, 7% teratozoospermia, 4% asthenozoospermia), varicocele in 12% (and this diagnosis is disputed), contamination in 7%, immunological variables in 3%, inherent and sexual variables each 2% and endocrine variables 0.6%. As with female subfertility, male infertility could be a red flag for other health conditions and is related with impeded by and large health, expanded cardiovascular chance and diminished life hope. Male variables account for at slightest 40-50% of cases of infertility, with numerous couples having anomalies in both accomplices-which, incidentally, may regularly be a reflection of shared way of life and practices that antagonistically influence both common and reproductive health.

There's no single test that will anticipate the richness potential of an person. The semen investigation is of course the essential test, and in spite of the changed WHO parameters and most recent manual for evaluation, the standard semen examination is destitute at separating those who are rich from those who are not. Semen analysis has small or no connection to the basic aetiology, and most treatments are based on improving sperm quality *in vitro* instead of treating the fundamental dysfunction. Couples with serious male factor infertility (MFI) may advantage from *in vitro* fertilisation (IVF)/intracytoplasmic sperm injection (ICSI), in spite of the fact that gentle to direct MFI is poorly characterized and treatment techniques are profoundly variable. Concern has been communicated that the advancement of ICSI has driven to a move absent from attempting to get it the causes of male infertility; undoubtedly, there are a few nations who offer ICSI to all couples experiencing IVF, though a more fitting rate would be around 40% of treatment cycles.

Of all sexually dynamic couples, 12%-15% are infertile, of which a male component can be distinguished 50% of the time either in separation or in combination with a female factor [2]. Past inquire about in a US male fertility clinic analyzing 1430 patients recognized causes of infertility from most to slightest common: varicocele, idiopathic, obstacle, female figure, cryptorchidism, immunologic, ejaculatory dysfunction, testicular failure, medicate effects/radiation, endocrinology, and all others. In any case, in spite of later technologic and demonstrative propels, idiopathic infertility remains a common determination, with roughly 25% of patients not having an identifiable cause of infertility.

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In any case, numerous recognizable causes of male infertility are treatable or preventable; in this way, a sharp understanding of these conditions remains foremost.

Male factor infertility, accounting for 50% of cases of infertility, is caused by anomalous sperm parameters^[3]. The extraordinary of this is often azoospermia, which portrays the nonappearance of sperm within the ejaculate. The causes of male infertility can be broadly classified by the position of the deformity within the hypothalamo-pituitary-gonadal (HPG) axis. Pre-testicular causes of male infertility are caused by hypothalamo-pituitary disease coming about in hypogonadotropic hypogonadism (low follicle-stimulating hormone (FSH)/luteinizing hormone (LH) and low testosterone). Testicular causes depict disabled spermatogenesis at the gonadal level and may be related with hypergonadotropic hypogonadism (high FSH/LH and low testosterone). At its most extreme, testicular dysfunction can result in nonobstructive azoospermia. Post-testicular causes speak to anatomic disturbance to outpouring and in this way obstructive azoospermia. In any case, in 30% - 40% of men with irregular semen parameters the cause of infertility remains elusive and is classed as idiopathic. In these cases it is suspected that hereditary components, natural contamination, hormonal disruptors, and responsive oxygen species play a causative role.

Evaluation

The evaluation of the barren man incorporates a history, physical examination, and semen examination^[4]. Baseline reproductive hormone testing (LH, FSH, testosterone, estradiol, prolactin) is performed when shown by the history and physical examination. The history reveals any underlying restorative or endocrine disease. Disappointment of the testicles to be slid at birth, postponed adolescence, inherent variations from the norm of the urinary tract or CNS, history of gynecomastia, and changes in moxie and power are side effects that recommend an basic endocrinologic anomaly. A history of genitourinary surgery, testicular injury, diseases or alter in semen volume recommends an anatomic deformity such as obstacle or ejaculatory channel sore. Drugs and solutions, liquor, chemical exposures, and other environmental risks can antagonistically influence infertility.

A total physical examination is performed in arrange to reveal any basic therapeutic conditions as well as hypogonadism. The last mentioned may display with eunuchoid extents, female body habitus, gynecomastia or anomalous genitalia. The substance of the scrotal sac are palpated for the nearness of the vas deferens, epididymes and varicocele. Testicular volume is measured with an orchidometer or calipers. Little testicles are related with reduced sperm generation.

Sexual Dysfunction

Satisfactory recurrence of intercourse and erectile function with ejaculation are fundamental^[5]. Semen quality may decrease with every day ejaculation, driving to medicine for substitute day intercourse. In any case, numerous thinks about appear superior semen quality with every day or more visit ejaculation. Endorsed timing for intercourse can make brokenness and conjugal push related to ondemand execution. Since of this, and since ovulation expectation may have up to a day of mistake, exhortation to have intercut "every day or two" during the rich parcel of the

cycle without reference to ovulation forecast may be accommodating. It permits a few suddenness without compromise of the chance for optimal timing. Sexual brokenness as often as possible goes with infertility. Men incapable to attain suitable coital recurrence and work ought to be assessed for hypogonadism. Discoveries will as a rule be ordinary and arrangement for marital/sexual counseling is at that point fitting.

Ejaculatory dysfunction may be psychogenic, happens after retroperitoneal node dissection, comes about from utilize of a few solutions, is common in men with diabetes, and isn't conceivable for most men with spinal harm. Acceptance of ejaculation is regularly effective utilizing high-amplitude vibratory incitement, which is less upsetting than electroejaculation, and permits for domestic utilize and domestic insemination for a few men. Actuated ejaculation can be complicated by autonomic dysreflexia, so starting endeavors ought to incorporate checking for this complication, which can be blunted with the use of nifedipine. Semen quality is regularly destitute in men with spinal line damage, so the central advantage of initiated ejaculation may be evasion of testicular spermatozoa extraction (TESE) for ICSI (intracytoplasmic spermatozoa injection). When azoospermia is found on an starting initiated ejaculation, moment endeavors or utilize of other strategies may abdicate semen with sperm adequate for Art with ICSI.

Etiology

Insights appear that male infertility accounts for roughly 30% to 40% of all infertility, female infertility accounts for around 30% to 40% of all infertility, and shared infertility accounts for around 20% to 30% of all infertility^[6].

- **Anovulation:** The eggs are not discharged.
- **Tubal factor:** The fallopian tubes are not obvious since of scarring from contamination, scar tissue from past restorative strategies, or blockage from conditions such as endometriosis. This accounts for around 30% of female infertility.
- **Inadequate ovulation:** Conditions that cause lacking ovulation incorporate Turner disorder, untimely menopause, untimely ovarian disappointment, and polycystic ovarian disorder. Insufficient ovulation accounts for around 30% of female infertility.
- **Cervical patency:** Variables that cause issues with the cervix incorporate a pinhole-size cervical os; thickened cervical bodily fluid, which ruins the transport of sperm; and cervical polyps. Issues with cervical patency account for around 20% of female infertility.
- Compromised uterine patency (coming about from scarring, a retroverted uterus, endometriosis, or fibroids) accounts for roughly 20% of female infertility.
- Other variables that impact infertility incorporate enthusiastic push, drawn out contraception, expanded age, natural poisons, lacking hormonal work, and misalignment of the spinal vertebrae.

Epidemiology

It is imperative to recognize regenerative potential, or capacity, from real regenerative execution, or results^[7]. Infertility is eventually characterized by a regenerative result (i.e., childlessness), but "male infertility" may be a determination of relative impedance in male regenerative potential. Before discussing male infertility in more detail,

we are going survey the the study of disease transmission of infertility in general.

Childlessness inside long-standing marriage has been watched to happen in generally 10% of couples in created nations. This figure speaks to a degree of reproductive outcomes, but it does not avoid couples who stay deliberately childless or don't have normal intercut amid the rich stage of the female's menstrual cycle.

The World Health Organization (WHO) has characterized infertility by "the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse," which captures the concept of disabled regenerative potential. By this criterion, the lifetime frequency of undesirable infertility is roughly 15% among couples in Western nations. Two-thirds of these cases are essential, that's, in couples who have never already conceived, whereas one-third are secondary.

It isn't exceptional to see infertility characterized by other lengths of time, such as 2 or 5 a long time. Also, whereas the result of intrigued within the WHO's definition is conception, others lean toward to respect infertility as the nonappearance of live birth. This distinction is critical, since 10-25% of recognized pregnancies conclusion in unsuccessful labor.

The yearly predominance of infertility among hitched US women matured 15-44 a long time was 6.7% in 2015, down from 11.2% in 1965, 8.5% in 1982, to 7.4% in 2002. This slant may reflect advancements in regenerative potential, maybe through superior mindfulness of perfect timing for intercut, which may be inferable to at-home ovulation tests. In any case, other variables may moreover be included, such as more couples utilizing infertility treatment earlier to coming to the 12-month limit essential for consideration within the rate's numerator. Declining marriage rates among lower socioeconomic classes may moreover be excessively evacuating women at more noteworthy chance of infertility from the denominator.

A well known misguided judgment is that infertility is synonymous with, or essentially approximates, sterility. In truth, as it were 3%–5% of couples are sterile.

Varicocele

A varicocele is a dilation of the pampiniform plexus likely caused by the nonattendance or inadequacy of the venous valves of the inner spermatic vein ^[2]. Varicoceles have long been related with infertility. The primary composed portrayal is credited to Celsius who taken note the affiliation between the varicocele and testicular decay. Within the 1800s, surgical rectification was seen to move forward semen quality. It is the foremost common surgically correctable cause of male infertility. Generally 12% of all men have a varicocele, but this number bounced to 35%-40% in men with infertility.

Varicoceles may influence numerous semen parameters, counting add up to sperm check, sperm motility, and sperm morphology. There are numerous hypotheses approximately the fundamental pathophysiology of a varicocele, with warm, renal metabolites, and hormonal variations from the norm all playing a role. Be that as it may, most concur that disturbance of the countercurrent warm trade instrument within the testis, causing hyperthermia, is the foremost likely component. Various considers point to impeded sperm generation and a diminish in semen quality when scrotal temperatures are lifted. One think about appeared

that men with scrotal skin temperatures over 35 °C for >75% of the day had sperm concentrations of 33 million/mL as compared with densities of 92 million/mL in men with scrotal skin temperatures more prominent than 35 °C for <50% of the day.

The instrument by which warm causes diminished sperm tallies is ineffectively caught on, but one theory is that expanded temperature might increment the metabolic rate of testicular and epididymal sperm. In any case, men with varicoceles illustrate expanded receptive oxygen species and diminished antioxidant capacity, which may change sperm DNA and can influence sperm development. Moreover, information has proposed that bigger varicoceles may be related with more significant oxidative push.

A to some degree questionable region with respect to the administration of varicoceles is related with hormonal variations from the norm. It has been hypothesized that the pathophysiology related with spermatogenesis may be pertinent to Leydig cells and testosterone union as well. Amassing information supports this theory of worldwide testicular dysfunction, and by repair of the varicocele, testosterone may progress. In truth, a meta-analysis in 2012 found a cruel advancement in testosterone of 97.5 ng/ dL. Be that as it may, the prove is to some degree blended as to the degree of advancement, with a few later imminent considers illustrating more humble testosterone increments. In this way, the clinical suggestions of varicoceles and their impacts on hypogonadism stay to some degree questionable.

Lifestyle

Hyperthermia is considered to be a major supporter within the pathogenesis of infertility in men with varicocele and cryptorchidism ^[2]. In this way, one may gather that other way of life components, such as clothing sort, warmed car seats, or word related exposures, may have a comparative impact. In any case, these cases have not been show in existing studies. The part of clothing fashion in male infertility has been explored. One little ponder of 14 normospermic men, a tight polyester scrotal back, when worn day and night, was appeared to form all azoospermic at a cruel time of 140 days. After removal of the scrotal back, all men recaptured work at a cruel time of 157 days. Be that as it may, ordinary clothing (i.e., boxer or brief style) has not been appeared to apply a critical influence on semen parameters. Other sorts of warm introduction, such as word related warm introduction in a gather of welders, have been appeared to diminish semen quality. Inactive pose, warmed car seats, and sauna and hot tub utilize are all way of life variables that increment scrotal temperature as well and may contribute to a decrease in fertility.

Cell phones have been ensnared as possibly playing a part in diminishing male fertility, and a few ponders appear that there may be a few premise for this hypothesis. One observational ponder evaluated semen parameters and cell phone utilization in 361 men who displayed to an infertility clinic. Roughly 60% of the men in this consider had more prominent than 2 h of cell phone utilize per day, with 30% utilizing their cell phones for more than 4 h per day. They found that sperm tallies, motility, reasonability, and morphology all declined with expanding cell phone utilize. The instrument by which cell phones influence semen parameters has not however been illustrated, but one theory is that cell phone-generated electromagnetic radiation (CPEMR) modifies mitochondrial work and acts to extend

reactive oxygen species. Usually to some degree authenticated by one consider which looked at the impacts of CPEMR on semen parameters and found increased levels of receptive oxygen species with diminished practicality and motility within the sperm uncovered to CPEMR.

Tobacco use has been embroiled within the pathogenesis of various cancers and restorative diseases. Whereas the utilize of tobacco essentially impacts female fertility, its affect on male fertility is less clear. Semen parameters, counting sperm thickness, motility, and morphology, have all been appeared to be compounded with tobacco utilize. In any case, a critical reduction in richness has not however been proven.

Another progressively common condition adversely affecting richness is weight. Obese men are at in expanded hazard of hypogonadism by means of both diminished emission and reaction to LH and expanded fringe aromatization of testosterone to estradiol. Besides, obese men are at an expanded hazard of creating cardiovascular illness and diabetes, which may compound these negative impacts.

Genetic Testing

Genetic testing could be a key component of the male infertility evaluation [8]. It gives essential data to set up causes of infertility, recognize clinically significant therapeutic comorbid conditions, and survey the probability of victory of certain richness treatment choices (i.e., microdissection testicular sperm extraction or varicocele repair). Moreover, it permits the clinician to direct partners on the potential hazard of transmitting genetic conditions to future progeny. The foremost common genetic causes of male infertility are cystic fibrosis transmembrane conductance controller (CFTR) quality changes, Y-chromosome microdeletions, and chromosomal irregularities. The CFTR quality is found on chromosome 7 and is related with cystic fibrosis (CF), CBAVD, and one-sided unlucky deficiencies of the vas. Nearly all men with CF have a CFTR change and CBAVD. Be that as it may, not all CFTR transformations are right now identified, and it is best to expect that men with CBAVD have a CFTR change and may be carriers of CF. It is hence basic to survey the female accomplice for CFTR carrier status earlier to proceeding with Art.

Karyotype assessment and Y-chromosome microdeletions are habitually utilized genetic tests to assess patients with extreme oligozoospermia (<5 million/ml) or nonobstructive azoospermia (NOA). A numeric or auxiliary chromosomal anomaly is recognized in generally 7% of barren men, and the degree of infertility contrarily connects with the nearness of chromosomal variations from the norm. Klinefelter's disorder is the foremost common chromosomal anomaly in barren men and accounts for over 60% of chromosomal anomalies recognized in workup of infertility. Couples ought to be counseled with respect to the potential for fatherly transmission of chromosomal anomalies because it can result in unsuccessful labor, birth surrenders, and other genetic disorders.

Y-chromosome microdeletions are distinguished in generally 10%-15% of guys with serious oligozoospermia or NOA. Regularly, microdeletions happen within the AZF districts (AZFa, AZFb, and AZFc) on the long arm of the Y-chromosome (the location of a few qualities required for ordinary spermatogenesis). A cancellation inside the Y-

chromosome does not fundamentally result in infertility, but sperm recovery endeavors are once in a while effective with an AZFa or AZFb cancellation. In any case, sperm recovery rates are as tall as 80% in patients with an confined AZFc cancellation. It is vague on the off chance that there are any therapeutic conditions related with Y-chromosome microdeletions, but all of the male offspring will acquire the anomaly, and fitting hereditary counseling is suggested.

Chromosomal Abnormalities

Chromosomal abnormalities are found in 4-15% of infertile men compared to 0.4% of the common populace [9]. The lower the sperm check the higher the predominance.

Klinefelter syndrome (KS) is the foremost common numerical anomaly; it happens in 1 in 500-1 in 1000 live male births and in up to 10% of men with nonobstructive azoospermia. Most cases are of the nonmosaic frame, 47XXY. KS is related with essential testicular disappointment. Patients show with azoospermia, hypogonadism, gynecomastia, decreased testicular estimate, and a few may have learning challenges. The seriousness of indications depends on the degree of Leydig cell dysfunction.

47XYY male syndrome is another numerical disorder occurring in 1 in 1000 births and is related with subfertility and tall stature. Patients may also have decreased insights, reserved conduct, and a better hazard of creating leukemia.

46,XX male disorder includes unusual translocation of the SRY quality from the Y chromosome to the X chromosome or an autosome during meiotic division of fatherly spermatogenesis. An SRY negative form includes actuation of qualities down the SRY cascade. In this way the gonads will create into testicles and the müllerian channel structures will relapse. The testes are little be that as it may, and there's no spermatogenesis due to the nonattendance of the azoospermia factor (AZF) locale. There may moreover be a degree of hypogonadism, gynecomastia, equivocal genitalia, and undescended testicles due to need of virilisation.

Basic chromosomal abandons incorporate adjusted Robertsonian and complementary translocations which are a cause of infertility and rehashed fetus removal. Since there's no misfortune of genetic material, patients will have ordinary phenotype; be that as it may, a few of the sperm will need or have overabundance hereditary material. Abnormal sperm experiences apoptosis, which clarifies why these patients display with azoospermia or oligozoospermia. During *in vitro* preparation (IVF) treatment, prenatal genetic diagnosis (PGD) could be a must to dodge the exchange of embryos with unbalanced karyotype.

Diagnosis

Infertility affects around 15% of couples craving conception, and male infertility underlies nearly half of the cases [10]. Assisted reproductive technology (Art) is progressively being used to overcome numerous sperm lacks and since of its viability it has been suggested by a few to speak to the treatment for all cases of male figure infertility regardless of etiology. In spite of the fact that the utilize of these advances may permit barren couples to realize pregnancy quickly, related higher taken a toll, potential security issues, and the fear of exchanging the superfluous burden of intrusive treatment on solid female accomplices weigh down this treatment alternative intensely.

Demonstrative imaging procedures may be demonstrated as portion of the total male richness assessment. Regenerative treatment can be foundations as it were after completion of a exhaustive assessment that starts with a point by point history and physical examination. Due to the presentation and upgrade of more up to date imaging modalities, dependable aides to clinical examination can be gotten to analyze a assortment of causes of male infertility counting varicocele, epididymal blockage, testicular microlithiasis (TM), seminal vesicle (SV) agenesis, and ejaculatory obstruction. Imaging plays a key part within the assessment of the hypospermia or azoospermic man. It can distinguish correctable variations from the norm, which can lead to a fruitful conception. It can too uncover possibly lifethreatening disarranges within the course of an infertility evaluation such as testicular tumors.

Sperm Evaluation

Agglutination of sperm is recognized and graded on wet-mount examination [5]. In the event that broad and related with a history testicular injury or vasectomy inversion, it proposes the nearness of antisperm antibodies. Prove proposing antibodies ought to be substantiated with particular testing, most commonly with the immunobead test. Antibodies may be coordinated at a assortment of antigens on distinctive locales of spermatozoa, with contrasting results for richness. Pregnancy can happen suddenly within the nearness of antisperm antibodies, but IUI (intrauterine insemination) has been utilized effectively when it does not. Fast weakening of semen upon collection for IUI may be useful. Art has moreover been utilized as treatment for antisperm antibodies. The expansion of ICSI addresses concern for impedances of antibodies with fertilization, but is as of now without prove for clinical advantage.

Truant motility happening with ordinary measures of imperativeness shows one of a few ultrastructural abandons influencing ciliary work in essential ciliary dyskinesia disorder. With unremitting respiratory disease and situs inversus, the determination of Kartagener's disorder can be made. These disarranges are autosomal passive quality surrenders influencing the a few proteins basic for ordinary ciliary ultrastructure and development. Chronic/recurrent respiratory function in these men is due to impeded mucociliary function. Assessment of sperm tail ultrastructure by electron microscopy can affirm determination, but the classic discoveries on semen examination with a normal history of respiratory disease and clinical discoveries for situs inversus are adequate for clinical conclusion. Pregnancy is accomplished with Art and ICSI.

Missing or negligible ejaculate after orgasmic masturbation recommends retrograde ejaculation or ejaculatory conduit obstruction. Qualification between the two depends upon post-ejaculation urine investigation, which is able appear unusually raised sperm numbers after retrograde ejaculation. Causes incorporate anatomic disturbances from prostate surgery, and neurologic dysfunction related to diabetes, demyelinating disarranges, or sequelae of retroperitoneal hub dismemberment. Pharmacologic disturbance of the ejaculatory signaling pathway may happen with alpha-adrenergic blockers utilized for pee stream with prostatic hyperplasia. Therapeutic medicines utilizing alpha sympathomimetic operators (ephedrine, phenylephrine) or

tricyclic antidepressants may offer assistance in a few occurrences. More frequently, collecting of sperm from postejaculatory urine that has been alkalized by bicarbonate ingestion is done so that IUI or Art may be undertaken.

Conclusion

Male fertility depends on many factors. Male gametes are produced in the testicles, and the formation of gametes is influenced by hormones, primarily testosterone. The hormonal role of the testes is influenced by the pituitary gland, which is the superior gland and secretes FSH and LH. LH stimulates the production of testosterone, which together with FSH stimulates the production of sperm. During ejaculation, the sperm are ejected with the seminal fluid produced by the prostate and together they form the ejaculate. The causes of infertility in men are diseases, infections or congenital disorders that lead to a decrease in the number or absence of sperm in the ejaculate, insufficient sperm motility or vas deferens, but are most often directly or indirectly related to spermatogenesis. Although the most common cause of infertility in men is varicocele, there are a number of other reasons that can cause infertility.

Conflict of Interest

Not available

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Not available

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