Genetic Causes of Male Infertility

Chromosomal Disorders, Y-Chromosome Microdeletions, CFTR Mutations, Single-Gene Disorders, Genetic Testing, ICSI and an Integrative Unani Approach

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Introduction

When a man receives an abnormal semen report, one of the questions he may ask me is:

"Doctor, is this because of something I have done, or could it be genetic?"

The answer is that male infertility has many possible causes. Lifestyle, infections, varicocele, hormonal disorders, medicines, environmental exposures and previous illnesses can all contribute. But in men with very severe sperm abnormalities—particularly **azoospermia, severe oligozoospermia or characteristic abnormalities of sperm structure or movement—a genetic cause becomes increasingly important to consider**.

The current European Association of Urology guideline recommends genetic evaluation particularly in men with azoospermia and severe oligozoospermia and recognizes chromosomal abnormalities, Y-chromosome microdeletions and CFTR-related reproductive-tract abnormalities as established genetic causes. Modern sequencing is now identifying an increasing number of single-gene causes as well.

This subject has become even more important because modern assisted reproductive techniques such as **intracytoplasmic sperm injection (ICSI)** can sometimes allow a man with extremely severe genetically determined infertility to father a biological child.

That is a major medical achievement.

But it also means that we must ask another question:

Could the genetic abnormality itself be transmitted to the child?

For this reason, genetic diagnosis in male infertility is not simply about explaining why the sperm count is low. It can influence treatment, determine whether surgical sperm retrieval is worthwhile, identify health risks for the patient, clarify risks to future children and help a couple make informed reproductive decisions.

My approach is therefore not:

“The sperm count is low, so give a sperm-increasing medicine.”

I prefer to ask:

What is the biological cause of the infertility, and will knowing the genetic diagnosis change what we should do?

What Does “Genetic Male Infertility” Mean?

Genetic male infertility occurs when a change in the chromosomes or DNA interferes with one or more parts of male reproductive function.

The abnormality may interfere with formation of the testes, hormonal signals controlling the testes, sperm production, meiosis, development of the sperm head or tail, movement of sperm, development of the vas deferens, or the ability of sperm to fertilize an egg.

Some genetic conditions produce **azoospermia**, meaning no sperm are found in the semen.

Others produce **oligozoospermia**, meaning a reduced sperm concentration.

Some primarily affect sperm motility, producing **asthenozoospermia**.

Others produce characteristic sperm-shape abnormalities known as **teratozoospermia**.

Still others cause congenital absence of the sperm-carrying ducts, so sperm may be produced normally but cannot enter the ejaculate.

Male infertility genetics is therefore not one disease. It is a large group of disorders affecting different stages of reproductive biology.

A 2025 review summarizes the modern genetic landscape as including chromosomal abnormalities, Y-chromosome microdeletions, single-gene disorders, mitochondrial abnormalities and emerging epigenetic mechanisms.

Why Genetics Becomes Especially Important in Severe Male Infertility

The more severe the sperm abnormality, the more important genetic investigation becomes.

In pooled data summarized by the EAU, chromosomal abnormalities were found in approximately **5.8% of infertile men overall**, compared with less than 1% in large newborn male populations. The prevalence becomes particularly relevant in men with azoospermia and very severe oligozoospermia.

This does not mean that every man with a low sperm count has a chromosome disorder.

Most do not.

But if a man has **azoospermia or sperm concentration in the very low millions or below**, we should think beyond diet, vitamins and lifestyle alone.

A genetic diagnosis may be waiting to be found.

Main Genetic Causes of Male Infertility

The most clinically important groups can be summarized as follows.

Genetic category	Examples	Typical reproductive effect	Why diagnosis matters
Sex-chromosome abnormalities	Klinefelter syndrome, 46,XX testicular DSD	Severe spermatogenic failure, often azoospermia	Prognosis, general health, sperm-retrieval counselling
Autosomal chromosomal rearrangements	Robertsonian or reciprocal translocation, inversion	Oligozoospermia, azoospermia, miscarriage risk	Risk of unbalanced embryos/fetuses; genetic counselling
Y-chromosome microdeletions	AZFa, AZFb, AZFc	Severe oligozoospermia or NOA	Predicts sperm-retrieval potential and transmission to sons
CFTR-related disease	CFTR variants associated with absent vas deferens	Obstructive azoospermia	Female partner testing and cystic-fibrosis reproductive risk

Genetic category	Examples	Typical reproductive effect	Why diagnosis matters
Monogenic spermatogenic failure	TEX11, FANCM, DMRT1, meiosis-related genes and others	NOA or severe oligozoospermia	Etiologic diagnosis and sometimes retrieval prognosis
Genetic sperm-head disorders	DPY19L2, AURKC, SUN5/PMFBP1 and others	Globozoospermia, macrozoospermia, acephalic sperm	Can alter ART strategy and genetic counselling
Genetic flagellar/motility disorders	DNAH1, CFAP genes and others	Severe asthenozoospermia/MMAF	Explains infertility and can reveal syndromic disease
Genetic hypogonadotropic hypogonadism	ANOS1, FGFR1, GNRHR and others	Low gonadotropins, low testosterone, reduced/absent sperm	Often medically treatable with fertility-preserving hormonal therapy

This table simplifies a very complex and rapidly expanding field. Hundreds of genes are being investigated, but not every reported association is established strongly enough to justify routine clinical testing.

Chromosomal Abnormalities

Humans normally have 46 chromosomes.

Twenty-two pairs are autosomes, and one pair comprises the sex chromosomes.

A typical male karyotype is:

46,XY

Infertility can arise when there is an extra chromosome, a missing chromosome, or when part of one chromosome has been rearranged.

These abnormalities are broadly divided into **numerical abnormalities** and **structural abnormalities**.

Current EAU and AUA/ASRM guidelines both recognize chromosomal abnormalities as major established genetic causes of severe impaired spermatogenesis.

Klinefelter Syndrome – 47,XXY

One of the most important chromosome disorders in male infertility is **Klinefelter syndrome**.

Instead of the usual 46,XY chromosomes, the most common form is:

47,XXY

Some men have mosaic forms—for example, a mixture of 46,XY and 47,XXY cells.

Klinefelter syndrome may cause small firm testes, elevated FSH and LH, reduced testosterone and severe impairment of sperm production. Many affected men have non-obstructive azoospermia.

But not every man has obvious symptoms.

Some patients are diagnosed only after marrying and undergoing infertility testing.

Klinefelter syndrome is important not only because of fertility. It can also have implications for hormonal, metabolic and broader long-term health, which is why current EAU guidance recommends ongoing endocrine follow-up.

Can a Man With Klinefelter Syndrome Have a Biological Child?

Sometimes, yes.

Although ejaculated sperm are uncommon in non-mosaic 47,XXY men, small areas of sperm production can occasionally remain inside the testes.

A 2025 systematic review and meta-analysis involving **2,815 men with non-mosaic Klinefelter syndrome** reported a median surgical sperm-retrieval rate of approximately **44%**. Importantly, the study did not find a major retrieval advantage from automatically performing surgery during adolescence rather than reproductive adulthood.

Therefore, I would never tell a patient with Klinefelter syndrome:

“You can definitely father a biological child.”

But I also would not automatically tell him:

“There is absolutely no possibility.”

The prognosis requires specialist assessment.

Structural Chromosomal Rearrangements

Some men have the correct number of chromosomes but pieces of the chromosomes are rearranged.

Examples include **Robertsonian translocations, reciprocal translocations and inversions**.

A man carrying a *balanced* translocation may appear completely healthy because essentially all necessary genetic material is present.

But sperm production can be impaired because chromosomes must pair and separate accurately during meiosis.

Some sperm may carry an unbalanced chromosome complement.

This can lead to infertility, recurrent miscarriage or a pregnancy affected by a chromosomal abnormality.

The EAU recommends genetic counselling for couples in whom a male partner carries an autosomal chromosomal rearrangement and recognizes increased risks of aneuploid or unbalanced fetal chromosome complements.

This is an important example of a man who may be completely physically healthy yet carry a genetic explanation for both infertility and repeated pregnancy loss.

Male Infertility and Recurrent Miscarriage

When a couple experiences recurrent pregnancy loss, the male partner should not automatically be assumed to have no contribution simply because his semen count is reasonable.

Balanced chromosomal rearrangements can affect the chromosomal composition of sperm while leaving the carrier himself healthy.

The current AUA/ASRM guideline recommends male karyotype assessment in couples with recurrent pregnancy loss.

This is one reason infertility care should consider the **genetic quality of reproduction as well as the number of sperm**.

What Is a Karyotype?

A karyotype is a laboratory examination of a person's chromosomes, usually using blood cells.

It can detect major chromosome-number changes and large structural rearrangements such as:

Klinefelter syndrome, translocations, some inversions and other visible chromosome abnormalities.

It does **not** detect every small DNA mutation.

That requires molecular genetic testing.

Who Should Have Karyotype Testing?

Different major guidelines use somewhat different criteria.

The current EAU guideline recommends standard karyotype analysis and genetic counselling for men with **azoospermia or sperm concentration below 5 million/mL**.

The AUA/ASRM 2024-amended guideline is somewhat more selective: it recommends karyotyping in men with primary infertility plus azoospermia or sperm concentration below 5 million/mL when accompanied by elevated FSH, testicular atrophy or another diagnosis indicating impaired sperm production.

This difference illustrates why genetic testing should be selected using the patient's complete clinical picture and the guideline framework being followed rather than relying on one internet threshold.

Y-Chromosome Microdeletions

The Y chromosome carries genes important for male sex development and spermatogenesis.

A particularly important region on its long arm is called the **azoospermia factor or AZF region**.

It is conventionally divided into:

AZFa, AZFb and AZFc.

Small deletions within these regions can severely interfere with sperm production.

These deletions are too small to be identified on an ordinary karyotype, so a separate molecular test is required.

Current EAU estimates place Y-chromosome microdeletions in approximately **8–12% of men with non-obstructive azoospermia** and roughly **3–7% of men with oligozoospermia**, with prevalence becoming very low once sperm concentration exceeds 5 million/mL.

AZFa Deletion

A **complete AZFa deletion** is usually associated with an extremely severe testicular phenotype, commonly a Sertoli-cell-only pattern.

This means the testicular tubules lack the germ cells required to make sperm.

For a patient, the most important clinical implication is that sperm retrieval is essentially not expected with complete AZFa deletion.

Current EAU guidance therefore recommends **not performing testicular sperm extraction when complete deletions involving AZFa are present**.

This is a powerful example of genetic testing preventing an unnecessary operation.

AZFb Deletion

Complete AZFb deletion is generally associated with severe interruption of sperm-cell maturation.

Again, the prognosis for surgical sperm retrieval is extremely poor.

Current European and American guidance advises against TESE/micro-TESE when complete AZFa or AZFb-region deletions predict the absence of retrievable sperm.

Without genetic testing, a patient might undergo surgery despite having a molecular diagnosis that already indicates essentially no realistic benefit.

AZFc Deletion

AZFc deletion is different.

It can produce a wide range of findings.

Some men have azoospermia.

Others have severe oligozoospermia.

And some retain sufficient focal sperm production for sperm to be found either in the semen or during testicular sperm extraction.

The EAU currently reports testicular sperm retrieval in approximately **50–75% of men with AZFc microdeletion** in published series.

But AZFc also raises an important inheritance issue.

Will a Y-Chromosome Microdeletion Be Passed to a Son?

Yes, when an affected man's Y chromosome is used to conceive a male child, the Y-chromosome deletion is transmitted with it.

The EAU therefore specifically advises counselling men with Yq microdeletions and their partners that **male offspring conceived using affected sperm will inherit the deletion**.

This does not mean ICSI should automatically be refused.

It means the couple deserves to understand the reproductive consequence before proceeding.

This is precisely the role of **genetic counselling**.

Who Should Have Y-Chromosome Microdeletion Testing?

Current evidence shows the greatest diagnostic yield at extremely low sperm concentrations.

The EAU recommends Y-chromosome microdeletion testing when sperm concentration is **1 million/mL or less** and says it should be considered below 5 million/mL.

The AUA/ASRM 2024 amendment recommends the test in men with primary infertility and azoospermia or sperm concentration **≤1 million/mL** when there is elevated FSH, testicular atrophy or another diagnosis indicating impaired sperm production.

Again, testing should be based on the clinical phenotype rather than performed indiscriminately in every man who presents with infertility.

CFTR Mutations and Congenital Absence of the Vas Deferens

Not every genetic infertility disorder affects sperm production.

Some affect the **sperm transport pathway**.

One of the most important examples involves the **CFTR gene**, which is associated with cystic fibrosis and related disorders.

Certain men with CFTR variants are born without one or both vas deferens.

When both sperm-carrying ducts are absent, the condition is called:

Congenital Bilateral Absence of the Vas Deferens — CBAVD.

The testes may continue producing sperm, but sperm cannot enter the ejaculate.

The result is **obstructive azoospermia**.

Current EAU guidance recognizes CFTR mutations as a major cause of CBAVD, while AUA/ASRM recommends CFTR carrier testing—including assessment of the 5T allele—in men with vasal agenesis or idiopathic obstructive azoospermia.

Why the Female Partner May Need CFTR Testing

Cystic fibrosis follows an **autosomal-recessive inheritance pattern**.

If an infertile man carries a clinically important CFTR variant and his female partner also carries a disease-causing CFTR variant, their child may be at risk of cystic fibrosis or another CFTR-related condition, depending on the exact variants involved.

For this reason, AUA/ASRM recommends genetic evaluation of the female partner when the male partner has a CFTR mutation or congenital absence of the vas deferens.

This is an excellent example of why genetic male-infertility testing is not only about the man.

It may change counselling for the entire couple and their future child.

Can a Man With CBAVD Become a Biological Father?

Often, yes.

In many men with CFTR-related CBAVD, sperm production remains reasonably preserved.

Sperm may be retrieved directly from the epididymis or testis and used with ICSI.

However, before proceeding, the couple should understand the CFTR findings and inheritance risk.

The fertility procedure solves the **transport problem**.

It does not remove the genetic variant.

Single-Gene Causes of Impaired Sperm Production

For many years, routine male infertility genetics consisted mainly of:

karyotype + Y-chromosome microdeletion testing + CFTR testing in appropriate obstructive cases.

That is now changing.

Modern whole-exome and whole-genome sequencing has identified many single-gene disorders associated with severe spermatogenic failure.

A 2025 systematic review of the literature identified **230 genes reported in association with azoospermia** when studies using WES and WGS were considered, although strength of evidence varies substantially among genes.

More importantly, a 2025 meta-analysis of nine studies involving **1,728 men with NOA** estimated that exome sequencing identified a potentially diagnostic genetic cause in approximately **15% overall**, but the authors considered the certainty low and warned that heterogeneous study methods may overestimate the true yield in general clinical populations.

So exome sequencing is promising—but it is not yet a test that gives every unexplained infertile man a definitive answer.

Which Single Genes Are Emerging in NOA?

The 2025 exome meta-analysis found recurrent pathogenic findings involving genes including **AR, TEX11, FANCM, TDRD9, PNLDC1, M1AP, FBXO15 and DMRT1**, among many others.

These genes participate in different stages of testicular development and spermatogenesis, including:

meiosis, DNA repair, germ-cell differentiation, chromosomal pairing and regulation of testicular function.

A separate 2025 review highlights genes such as **SYCP1, SYCE1 and HORMAD1**, illustrating how defects in the complex meiotic machinery can arrest sperm production.

The important clinical point is not that patients should memorize these names.

It is that a semen report saying **"idiopathic azoospermia"** may sometimes reflect a genetic disorder that conventional chromosome and Y-deletion tests cannot detect.

TEX11 and Meiotic Arrest

TEX11 is one example that illustrates the importance of modern genetics.

The gene is involved in meiosis—the special cell division required to generate sperm.

Certain pathogenic TEX11 variants can cause meiotic arrest and non-obstructive azoospermia.

A man's testes may contain developing germ cells but fail to complete the process needed to produce mature sperm.

Such a patient may previously have been labelled as having unexplained maturation arrest.

Molecular testing can sometimes convert that nonspecific diagnosis into a biological explanation.

Genetic Causes of Abnormal Sperm Morphology

Genetics is also particularly important when most sperm show a **very unusual and consistent structural abnormality**.

This is different from ordinary nonspecific teratozoospermia, in which several different abnormalities may coexist.

Some severe, nearly uniform sperm-shape patterns have strong genetic associations.

Recent reviews highlight several well-established examples.

Globozoospermia and DPY19L2

In **globozoospermia**, sperm have round heads and lack the normal acrosomal structure needed for fertilization.

The **DPY19L2 gene** is one of the most important genetic causes.

Other genes have also been reported, including SPATA16 and several emerging genes.

Identifying the phenotype is important because simply reporting “abnormal morphology” may miss a much more specific genetic sperm disorder.

Macrozoospermia and AURKC

Macrozoospermia is characterized by very large sperm heads, often accompanied by multiple tails and major chromosome abnormalities within the sperm.

Pathogenic variants in **AURKC** are a well-established cause.

This genetic diagnosis can be highly relevant before ICSI because the chromosomal quality of affected sperm may be profoundly abnormal.

Therefore, the correct response to severe monomorphic teratozoospermia is not always merely:

“Select the best-looking sperm and perform ICSI.”

The genetic mechanism may change counselling.

Acephalic Spermatozoa Syndrome

In acephalic or “headless sperm” syndromes, the connection between sperm head and tail is abnormal.

Genes such as **SUN5 and PMFBP1** have been implicated among others.

Some patients have very few complete sperm available for use in assisted reproduction.

Identifying the genetic cause can explain the otherwise striking laboratory finding and may help reproductive counselling.

Multiple Morphological Abnormalities of the Flagella – MMAF

Some men have sperm with short, absent, bent, coiled or irregular tails and extremely poor motility.

This phenotype is known as **multiple morphological abnormalities of the flagella**, or MMAF.

It is genetically heterogeneous.

Recent reviews describe pathogenic variants involving **DNAH1, DNAH2, DNAH6, DNAH17, CFAP43, CFAP44, FSIP2** and many additional flagellar genes.

The 2026 systematic review of WES/WGS research found that MMAF was one of the male-infertility phenotypes with the highest genetic diagnostic yield; studies applying ACMG criteria reported yields around **48% for MMAF**, compared with lower yields for heterogeneous NOA.

This is an excellent example of how **a very specific semen phenotype can make targeted genetic testing more informative**.

Primary Ciliary Dyskinesia and Sperm Motility

Some genes needed for sperm-tail movement are also required for movement of cilia in the respiratory tract.

Therefore, a man with severe asthenozoospermia may also report:

chronic sinus problems, recurrent respiratory infections, bronchiectasis or other features of a ciliopathy.

In such patients, infertility may be part of a wider genetic syndrome rather than an isolated sperm disorder.

This demonstrates why I consider the patient's **complete medical history** important, not just his semen report.

Genetic Causes of Hypogonadotropic Hypogonadism

Some male infertility is genetic because the brain and pituitary fail to send the correct hormonal signals to the testes.

This is known as **congenital hypogonadotropic hypogonadism (CHH)**.

Genes involved can include **ANOS1, FGFR1, GNRHR, NR0B1** and others.

A 2025 systematic review re-evaluating reported genetic variants found bona fide disease-causing variants in 29 genes; ANOS1 and FGFR1 were especially prominent in men with absent puberty, while FGFR1, NR0B1 and GNRHR were important in partial forms.

This category is particularly important because the testes may retain the ability to produce sperm if they are given appropriate hormonal stimulation.

Kallmann Syndrome

Kallmann syndrome is a form of congenital hypogonadotropic hypogonadism in which deficient GnRH signaling is associated with reduced or absent sense of smell.

Affected males may have delayed or absent puberty, low testosterone, small testes and infertility.

Unlike many forms of primary testicular failure, fertility can sometimes be induced with appropriate specialist hormonal therapy such as gonadotropins.

Therefore, identifying the biological mechanism matters enormously.

Two men can both have azoospermia, yet one may need micro-TESE while another may need months of hormonal stimulation.

Androgen Receptor Gene Abnormalities

The **androgen receptor (AR) gene** allows tissues to respond to testosterone and related androgens.

Pathogenic AR variants can produce a wide clinical spectrum, from complete androgen insensitivity to milder forms associated with undervirilization or impaired fertility.

AR was also among the recurrent genes identified in the recent exome-sequencing meta-analysis of NOA.

This illustrates another important principle:

A patient can have testosterone circulating in the blood, but if the body's cellular response to androgen is abnormal, the reproductive consequences may still be profound.

Genetics of Cryptorchidism and Testicular Development

Undescended testes can occur as part of complex developmental and genetic conditions.

Genes involved in hormonal signalling and testicular descent have been studied in this context.

Not every case of cryptorchidism has an identifiable genetic cause, but in syndromic or unusual cases, broader genetic evaluation may be relevant.

A patient's childhood reproductive history therefore has value even decades later when he presents with infertility.

The New Era of Whole-Exome and Whole-Genome Sequencing

Male infertility genetics is undergoing a major transformation.

Traditional genetic testing looks at a relatively small number of known abnormalities.

Whole-exome sequencing (WES) evaluates most protein-coding regions of the genome.

Whole-genome sequencing (WGS) examines a much broader proportion of DNA.

A 2026 systematic review of WES/WGS studies published between 2014 and 2024 identified **143 unique genes** reported in sporadic male infertility after deduplication, but only about one-third had functional validation; many were based on isolated studies, and variants of uncertain significance were common.

This finding is exciting, but it also teaches caution.

Finding a DNA variant does not automatically prove that it caused infertility.

What Is a Variant of Uncertain Significance?

A **variant of uncertain significance**, or VUS, is a DNA change for which current evidence is insufficient to classify it confidently as either disease-causing or harmless.

This is one of the major challenges with large genetic panels and exome sequencing.

The 2026 WES/WGS systematic review reported an average VUS burden of approximately **47%** in studies using standardized ACMG classification.

Therefore, patients should be cautious about reports that list many "mutations" and then imply that every one of them explains infertility.

A genetic finding should be interpreted based upon:

the specific variant, inheritance pattern, phenotype, population frequency, laboratory evidence, family segregation and the strength of the established gene-disease relationship.

This is why clinical genetics expertise is important.

Is Whole-Exome Sequencing Now Routine for Every Infertile Man?

No.

Current EAU guidance states that the diagnostic yield of exome sequencing is increasing in NOA and in specific sperm morphology, flagellar and sperm-function disorders, but more validation across populations is needed before broad recommendations for standard use can be made.

A 2026 expert review likewise describes WES-derived virtual gene panels as increasingly important but emphasizes careful gene validation and individualized genetic counselling.

Therefore, WES may be especially reasonable in selected patients such as those with severe unexplained NOA, a striking monomorphic sperm abnormality, congenital reproductive abnormalities, a suggestive family history or syndromic features after established first-line genetic tests are unrevealing.

India and Male Infertility Genetics

Genetic research is increasingly being performed in Indian male-infertility populations rather than assuming that results from European or North American cohorts automatically represent every population.

A 2026 Indian study of 247 men with severe sperm abnormalities identified sex-chromosome aneuploidies and clinically relevant AZF microdeletions and also applied targeted gene sequencing and WES in subsets of participants.

This type of population-specific research is important because variant frequencies, founder effects, consanguinity patterns and the prevalence of particular genetic abnormalities can vary between populations.

For clinical practice in India, genetic testing should therefore use qualified laboratories and appropriate interpretation rather than blindly applying population-specific frequency estimates from elsewhere.

Can a Genetic Cause Be Treated?

This is one of the most important patient questions.

The answer depends upon what we mean by “treated.”

Some genetic disorders cannot currently be corrected at the DNA level.

For example, current medicine cannot remove an extra X chromosome from the cells of a man with Klinefelter syndrome.

We cannot restore a completely deleted AZFa region of the Y chromosome.

We cannot change an inherited CFTR mutation through a fertility medicine.

But **the reproductive consequences can sometimes be managed**.

A man with Klinefelter syndrome may have retrievable testicular sperm.

A man with AZFc deletion may have sperm in the ejaculate or testis.

A man with CBAVD may have sperm retrieved and used through ICSI.

A man with genetic hypogonadotropic hypogonadism may produce sperm after gonadotropin therapy.

A couple with an inherited disease risk may consider IVF with appropriate preimplantation genetic testing when technically and clinically suitable.

So a genetic diagnosis does not automatically mean there is no treatment.

It means treatment should be **genotype- and phenotype-aware**.

When Genetics Can Prevent Unnecessary Treatment

Genetic testing is sometimes most valuable because it tells us what **not** to do.

For example, a man with complete AZFa or AZFb deletion should generally not undergo repeated micro-TESE procedures hoping that sperm will suddenly be found. Current guidelines advise against testicular sperm extraction because the expected retrieval probability is essentially absent.

Similarly, a man with a major chromosome rearrangement needs genetic counselling rather than years of nonspecific antioxidant treatment.

A man with CBAVD needs investigation of CFTR and reproductive planning, not simply medicines intended to increase sperm count.

This is why genetic diagnosis can save time, money and emotional suffering.

ICSI and Genetic Male Infertility

ICSI has revolutionized the treatment of severe male infertility.

Only one suitable sperm is required for injection into each mature oocyte.

That means men with extremely low sperm counts, surgically retrieved sperm or certain severe sperm abnormalities may still have reproductive options.

But ICSI does not “repair” a genetic abnormality.

It bypasses many of the natural steps involved in fertilization.

Therefore, if the sperm carries a transmissible genetic abnormality, ICSI can permit that genetic material to contribute to the embryo.

This is why genetic counselling becomes particularly important before assisted reproduction in severe genetically determined infertility.

Genetic Counselling Before ICSI

Genetic counselling should explain what was found, whether it is definitely causal or only possibly relevant, the inheritance pattern, the implications for sperm retrieval or treatment, and what the finding could mean for children.

The current EAU guideline strongly recommends genetic counselling when an inheritable abnormality is identified.

Good counselling should not tell a couple what reproductive decision to make.

It should give them enough accurate information to make their own decision.

Preimplantation Genetic Testing

Preimplantation genetic testing can sometimes be considered when IVF is being performed and a significant known genetic risk exists.

Different forms have different purposes.

For a **specific single-gene disorder**, PGT-M may be considered.

For a **chromosomal structural rearrangement**, testing strategies designed for structural rearrangements may be considered.

ASRM emphasizes that PGT-M requires individualized test development and specialist genetic counselling and should remain an optional reproductive choice rather than an automatic requirement.

Even after PGT-M, prenatal diagnostic testing may still be discussed because embryo testing has technical limitations.

Genetic Infertility Does Not Mean Every Child Will Be Affected

This is a common misunderstanding.

Risk depends entirely on the genetic diagnosis.

A Y-chromosome microdeletion is expected to pass to a son when the affected Y chromosome is transmitted.

A CFTR-related disease risk depends on the variants carried by both parents.

A balanced chromosomal translocation can generate both balanced and unbalanced gametes.

Some dominant disorders may have an approximately one-in-two transmission possibility.

Some recessive disorders require both partners to carry relevant variants.

Some chromosome abnormalities arise de novo and do not behave like ordinary inherited Mendelian disorders.

Therefore, the statement:

“My infertility is genetic, so my child will definitely have infertility”

is usually too simplistic.

The specific diagnosis determines the risk.

Does Genetic Infertility Mean the Man Is Otherwise Unhealthy?

Not necessarily.

Many genetic infertility conditions primarily affect reproduction.

But some have broader health implications.

Klinefelter syndrome is associated with endocrine, metabolic and cardiovascular concerns requiring medical follow-up.

Certain ciliopathy genes can affect the respiratory system.

Congenital hypogonadotropic syndromes may have neurological or developmental features.

Some emerging genetic diagnoses may also identify previously unrecognized syndromic health risks.

A 2026 review therefore emphasizes that genetic diagnosis can have implications not only for reproduction but also for the patient's short- and long-term health.

This is another reason I consider infertility an important window into men's health.

What About Mitochondrial DNA and Epigenetics?

Mitochondria supply much of the energy required for sperm movement.

Research has linked mitochondrial DNA abnormalities with impaired sperm function in some populations.

Epigenetics refers to molecular changes that influence gene activity without necessarily changing the underlying DNA sequence.

Altered DNA methylation and other epigenetic mechanisms are being actively investigated in male infertility.

Current research recognizes mitochondrial and epigenetic abnormalities as important emerging fields, but these are not yet equivalent to established routine tests such as karyotyping, AZF testing or CFTR testing.

Patients should therefore be cautious about commercial genetic or epigenetic tests marketed as though they already provide definitive answers for every infertility case.

Family History Can Be Important

I ask infertile men about the reproductive health of their relatives.

Relevant clues can include a brother with infertility, several male relatives without children, recurrent miscarriages in the family, congenital abnormalities, delayed puberty, cystic fibrosis, unexplained early deaths or a known chromosomal disorder.

A negative family history does **not** exclude a genetic cause.

Many genetic abnormalities arise de novo, follow recessive inheritance or remain hidden in previous generations.

But a strong family history can substantially increase suspicion and help select appropriate testing.

Consanguinity and Recessive Male Infertility Genes

Recessive genetic conditions become more likely when both parents share ancestral genetic material.

A 2025 review of WES/WGS-discovered NOA genes specifically highlights the value of studying consanguineous families for identifying recessive causes of spermatogenic failure.

This does not mean consanguinity automatically causes male infertility.

It means that rare recessive disease-causing variants have a greater chance of being inherited from both parents when parents are biologically related.

A careful family history remains important.

How I Evaluate Possible Genetic Male Infertility

When I see an infertile man, I do not begin with the assumption that he has a genetic disease.

I first look at the entire reproductive phenotype.

I consider the duration of infertility, semen concentration, motility and morphology, whether azoospermia is obstructive or non-obstructive, testicular size, FSH, LH and testosterone, history of undescended testes, puberty, previous pregnancies, infections, surgery, medicines, testosterone or steroid use, family history and the female partner's reproductive condition.

The EAU similarly recommends complete medical, reproductive and family history, physical examination, semen analysis and appropriate hormonal assessment as the foundation of male infertility evaluation before genetic testing is interpreted.

Genetics should be integrated into clinical medicine—not ordered in isolation.

A Normal Semen Analysis Does Not Exclude Every Genetic Issue

Most clinically important male infertility genes present with abnormal semen findings.

But genetics can influence reproductive outcomes in more subtle ways, including embryo chromosome balance or recurrent pregnancy loss.

Therefore, when a couple has repeated miscarriages or unexplained repeated ART problems, the genetic evaluation may extend beyond a basic semen count.

The appropriate assessment should be individualized rather than ordering every available genetic test for every couple.

Genetic Testing Does Not Replace Semen Analysis

Another common misunderstanding is that an advanced genetic panel can somehow replace conventional infertility evaluation.

It cannot.

A genetic report needs a phenotype.

Without knowing whether the patient has azoospermia, severe oligozoospermia, globozoospermia, MMAF or another specific reproductive abnormality, interpreting variants becomes much more difficult.

This is why modern genetics works best when the semen laboratory, clinician and genetics laboratory communicate.

Male Infertility Is a Couple's Reproductive Condition

Even when a severe male genetic factor is identified, the female partner should still be evaluated.

Her age, ovarian reserve, ovulatory function, uterine condition and other fertility factors affect the timing and suitability of treatment.

WHO's first global infertility guideline, published in November 2025, emphasizes systematic, person-centred infertility assessment and management rather than focusing on one partner in isolation.

This becomes especially important when a man is considering months of hormonal treatment, sperm retrieval or IVF/ICSI.

Can Lifestyle Reverse a Genetic Cause?

No lifestyle intervention can change a chromosome number, restore a deleted section of the Y chromosome or remove a pathogenic DNA mutation.

But that does not mean lifestyle is irrelevant.

A man can have both a genetic cause and modifiable reproductive-health problems.

For example, a man with a Y-chromosome abnormality may also smoke heavily, be obese, have diabetes, sleep poorly or use anabolic steroids.

Correcting those factors will not remove the genetic defect, but it may protect his remaining testicular and general health.

This distinction is particularly important in integrative treatment.

Genetic Causes of Male Infertility and the Unani System of Medicine

As a physician trained in the **Unani System of Medicine**, I believe genetic male infertility is a condition in which Unani principles should be applied carefully and realistically.

Official CCRUM material describes **Izala-i-Sabab**, or removal/correction of causative factors, as a fundamental principle of Unani treatment. It also describes the major therapeutic approaches as **Ilaj-bil-Ghiza (dietotherapy), Ilaj-bil-Tadbir (regimental therapy), Ilaj-bil-Dawa (pharmacotherapy) and Ilaj-bil-Yad (surgical or procedural treatment)**.

For me, the principle of **Izala-i-Sabab** is especially relevant here.

But it must be interpreted scientifically.

If the cause is genetic, we should identify it accurately.

Can Unani Medicine Change a Genetic Mutation?

At present, the answer is **no**.

No proven Unani formulation can remove an extra chromosome, replace a deleted AZFa region, correct a pathogenic CFTR variant or reverse a disease-causing DNA mutation throughout a man's germline.

And this limitation is not unique to Unani medicine.

Most current conventional treatments also cannot directly rewrite these inherited genetic causes.

The practical medical question is therefore:

What aspects of the patient's reproductive health can still be treated or supported despite the genetic diagnosis?

That is where a responsible integrative approach becomes useful.

How Unani Medicine May Still Be Useful

A patient with genetic infertility is still a complete human being, not merely a chromosome report.

He may also have poor nutrition, obesity, metabolic dysfunction, chronic stress, sleep disturbance, sexual anxiety, reduced confidence or other modifiable problems.

An individualized Unani framework can contribute through **diet, healthy daily routine, physical activity, sleep regulation, stress management and carefully selected supportive pharmacotherapy when appropriate**.

CCRUM's official description of Unani medicine emphasizes a holistic assessment that considers lifestyle, physical and emotional state and the organs involved rather than treating only one laboratory value.

These principles may support the patient's general reproductive and sexual health even though they do not change the underlying chromosome or gene.

Ilaj-bil-Ghiza – Dietotherapy

Good nutrition remains useful in male infertility whether the underlying cause is genetic or acquired.

An appropriate dietary plan may support healthy body weight, glucose metabolism, micronutrient sufficiency and general reproductive health.

However, I am careful to explain that food cannot correct a chromosomal abnormality.

A man with Klinefelter syndrome will not become 46,XY because of a special food.

A man with AZFa deletion will not regenerate the missing Y-chromosome DNA by eating seeds, nuts or herbs.

Diet should therefore be used for what it can reasonably achieve: **supporting overall health and reducing modifiable additional reproductive stress**.

Ilaj-bil-Tadbir – Regimental and Lifestyle Care

Unani regimental care places importance on daily routine, physical activity, rest and broader health maintenance.

For an infertile patient, practical contemporary applications may include improving sleep, maintaining appropriate exercise, optimizing weight, managing stress, avoiding tobacco and anabolic steroids and supporting metabolic health.

These factors can improve the biological environment in which the remaining reproductive system functions.

But they should not delay genetic counselling or reproductive treatment when time matters.

Ilaj-bil-Dawa – Unani Pharmacotherapy

Unani medicine has a long tradition of medicines used for male reproductive complaints.

Some preliminary Unani studies have reported improvements in semen parameters in men with oligozoospermia.

But **oligozoospermia is not the same as a proven genetic spermatogenic disorder**, and improved semen parameters in a small study cannot be generalized to conditions such as Klinefelter syndrome, complete AZFa deletion or monogenic meiotic arrest.

Therefore, I consider Unani pharmacotherapy a potential **supportive individualized component**, not a scientifically established method of correcting genetic infertility.

Patients deserve this distinction.

Why I Do Not Promise a Genetic "Cure"

When a patient is frightened, exaggerated promises can be emotionally attractive.

But they are medically dangerous.

If a man has complete AZFa deletion, spending years taking different fertility medicines cannot reconstruct the missing genetic region.

If his partner's reproductive age is advancing, those lost years may substantially reduce the couple's overall opportunity for parenthood.

Responsible treatment means knowing when a medicine is reasonable and when modern reproductive technology or genetic counselling should be discussed.

This is one of the most important ways an integrative clinic can protect patients.

Modern Medicine and Unani Medicine Should Not Compete Here

In my view, genetic male infertility demonstrates why different medical approaches must be used according to their appropriate role.

Modern genetic testing can tell us whether chromosomes, Y-chromosome regions or specific genes are abnormal.

Microsurgical sperm retrieval can sometimes locate rare sperm.

ICSI can allow fertilization when sperm numbers are extremely limited.

Genetic counselling can explain inheritance.

At the same time, Unani principles can support general health, diet, lifestyle and psychological well-being in an individualized way.

A patient benefits most when these tools are coordinated rather than presented as competing alternatives.

The Saira Health Care Approach to Genetic Male Infertility

At **Saira Health Care**, my preferred approach is not to label every severe semen abnormality “genetic” and it is equally not to ignore genetics while giving repeated empirical medicines.

I first want to establish the reproductive phenotype.

Is the patient azoospermic?

Is it obstructive or non-obstructive?

Is the sperm concentration below one million?

Are most sperm round-headed?

Are they unusually large-headed?

Are the tails severely malformed?

Are both vas deferens present?

Was puberty normal?

Are FSH and LH elevated?

Does the family history suggest an inherited disorder?

Once we understand the phenotype, genetic testing becomes far more meaningful.

Confirming the Semen Abnormality Comes First

If a patient has one abnormal semen report, the diagnosis should be confirmed properly before complex genetic decisions are made.

For azoospermia or severe oligozoospermia, accurate laboratory processing is essential.

For unusual morphology, the laboratory should establish whether a true **monomorphic abnormality** exists rather than simply reporting a low overall morphology percentage.

A 2025 expert review recommends specifically recognizing characteristic abnormalities such as globozoospermia, macrocephalic sperm syndrome, pinhead sperm syndrome and multiple flagellar abnormalities because these patterns can point toward genetic disease.

Choosing the Right Genetic Test

The appropriate genetic test depends on what we are trying to diagnose.

In severe sperm-production failure, karyotype and Y-chromosome microdeletion testing may be appropriate.

In vasal agenesis or idiopathic obstructive azoospermia, CFTR testing becomes particularly relevant.

In a striking monomorphic sperm defect, phenotype-specific gene testing may be considered.

In severe unexplained NOA after routine genetic tests are negative, carefully selected exome or gene-panel testing may increasingly be useful.

This is more rational than ordering an enormous commercial DNA panel without knowing what clinical question it is supposed to answer.

How a Genetic Result Can Change Treatment at Saira Health Care

A useful genetic test should ideally alter clinical understanding or management.

If complete AZFa deletion is found, unnecessary TESE can be avoided.

If AZFc is found, sperm retrieval may remain reasonable, but inheritance to sons must be discussed.

If CBAVD and a CFTR variant are identified, the female partner should be evaluated.

If Klinefelter syndrome is diagnosed, reproductive options and long-term endocrine health both need attention.

If a chromosomal translocation is present, the couple needs reproductive-genetic counselling.

If hypogonadotropic hypogonadism has a genetic basis, fertility-inducing hormonal therapy may still be possible.

This is the type of **cause-oriented infertility treatment** I consider clinically meaningful.

Fertility Treatment After a Genetic Diagnosis

A genetic diagnosis does not automatically determine one treatment.

Depending on the condition, options may include natural conception where sperm production remains adequate, fertility-preserving hormonal treatment in suitable endocrine disorders, sperm cryopreservation when very rare ejaculated sperm are available, micro-TESE for selected non-obstructive azoospermia, epididymal or testicular sperm retrieval for congenital obstruction, IVF/ICSI, and genetic counselling with consideration of appropriate preimplantation or prenatal genetic testing.

Which pathway is appropriate depends on the exact diagnosis and the couple's circumstances.

Why Female Age Still Matters

Suppose a man has a complex genetic infertility condition but his partner is young with good ovarian reserve.

The couple may have more time to complete extensive diagnostic work and consider several reproductive options.

If the female partner has significantly diminished ovarian reserve or advanced reproductive age, prolonged empirical treatment may cost valuable reproductive time.

The latest WHO infertility guideline emphasizes treatment pathways based on both partners' findings and preferences rather than focusing on one abnormal test.

Genetics should therefore be integrated into a **couple-based fertility strategy**.

Emotional Impact of a Genetic Diagnosis

Some men feel especially distressed when they hear that their infertility is genetic.

They may think:

“There is something defective in me.”

Others worry:

“Have I given my wife a problem she can never overcome?”

And some become afraid of passing infertility or illness to a child.

These concerns deserve careful counselling.

A genetic condition is a biological diagnosis, not a judgement about a person's value, masculinity or suitability as a partner.

Infertility counselling should make room for these emotional consequences rather than focusing only on laboratory reports and procedures.

Genetic Infertility Does Not Mean Sexual Weakness

A man can have:

normal libido, strong erections, normal intercourse, normal ejaculation and severe genetically determined infertility.

Sperm production and sexual performance are different physiological functions.

Likewise, a man with a genetic endocrine condition may have both sexual and reproductive symptoms.

Correctly explaining this distinction can prevent unnecessary shame and sexual performance anxiety.

When Should Genetic Causes Be Considered Strongly?

I become particularly alert to a possible genetic cause when a patient has repeated azoospermia, very severe oligozoospermia, markedly elevated FSH and small testes, congenital absence of the vas deferens, delayed or abnormal puberty, a characteristic sperm morphology syndrome, extreme sperm immotility with syndromic features, a strong family history, recurrent pregnancy loss, or an unexplained severe spermatogenic disorder despite an otherwise unrevealing evaluation.

Genetic testing should not be treated as a routine screening package for every man with mild infertility.

It has the greatest value when the patient's clinical phenotype creates a meaningful pre-test probability.

Frequently Asked Questions

Can male infertility really be inherited?

Yes. Some forms are directly inherited, while others arise from new chromosome or DNA changes. The inheritance pattern depends entirely on the genetic diagnosis.

What are the most important established genetic causes?

Chromosomal abnormalities such as Klinefelter syndrome and structural rearrangements, Y-chromosome AZF microdeletions and CFTR-related absence of the vas deferens are among the best-established causes in routine clinical practice.

Does every man with azoospermia need genetic testing?

Genetic testing is particularly important in non-obstructive azoospermia. Current EAU guidance recommends karyotyping in azoospermia and Y-microdeletion testing according to sperm-production phenotype; CFTR testing is instead particularly relevant to vasal agenesis or unexplained obstructive azoospermia.

Why is Y-chromosome testing important before micro-TESE?

Because complete AZFa or AZFb-region deletions predict essentially no useful sperm-retrieval potential and can spare the patient an unnecessary operation. AZFc deletion carries a different prognosis.

Can a man with AZFc deletion become a father?

Sometimes. Sperm may be available in semen or retrieved surgically. However, a son conceived using affected sperm will inherit the Y-chromosome deletion.

Can Klinefelter syndrome cause azoospermia?

Yes. Klinefelter syndrome is a major genetic cause of non-obstructive azoospermia, but focal sperm production can remain in some men. A 2025 meta-analysis reported a median retrieval rate of approximately 44% across published cohorts.

Is CFTR only related to lung disease?

No. Certain CFTR variants can affect development of the vas deferens and cause obstructive azoospermia even in men without classic cystic-fibrosis symptoms.

Should my wife be tested if I have a CFTR mutation?

Yes, appropriate female-partner genetic evaluation is recommended when the male partner has a clinically relevant CFTR mutation or congenital absence of the vas deferens.

Can a chromosome translocation cause miscarriage?

Yes. Balanced translocation carriers can produce sperm with unbalanced chromosome combinations, increasing risks of infertility, pregnancy loss or chromosomally unbalanced offspring.

Can whole-exome sequencing find the cause when normal genetic tests are negative?

Sometimes. A 2025 meta-analysis estimated an overall diagnostic yield of around 15% in studied men with NOA, but evidence was heterogeneous and many cases still remained unexplained.

Is every gene found on an infertility panel definitely responsible?

No. Many findings are variants of uncertain significance, and some newly reported genes lack enough validation to prove causality.

Are sperm-shape problems sometimes genetic?

Yes. Strong examples include DPY19L2-associated globozoospermia, AURKC-associated macrozoospermia and several genes causing acephalic sperm or severe flagellar abnormalities.

Can a genetic cause be permanently cured with medicine?

Most chromosome and DNA abnormalities cannot currently be corrected by conventional or Unani medicines. However, some reproductive consequences can be managed with hormonal therapy, sperm retrieval, ICSI and genetic counselling depending on the diagnosis.

Can Unani medicine help genetic infertility?

Unani medicine may provide **supportive individualized care** through nutrition, lifestyle, metabolic-health optimization, sleep, stress management and selected pharmacotherapy. However, there is no high-quality evidence that a Unani formulation can reverse chromosomal abnormalities, Y-chromosome deletions or pathogenic gene mutations.

A Message to My Patients

When a patient asks me:

“Doctor, if my problem is genetic, does that mean there is no treatment?”

I explain that a genetic diagnosis does not automatically mean treatment is impossible.

What it means is that we need to stop treating infertility as one disease.

If you have a CFTR-related absent vas deferens, the testes may still be making sperm.

If you have AZFc deletion, sperm may still sometimes be available.

If you have complete AZFa deletion, a surgical sperm search is unlikely to help, and knowing this can prevent unnecessary surgery.

If you have genetically determined hypogonadotropic hypogonadism, fertility may sometimes be induced with the correct hormonal treatment.

If you carry a balanced chromosome translocation, the issue may be embryo chromosome balance rather than an inability to produce any sperm.

And if modern sequencing finds a single-gene spermatogenic disorder, at minimum we may finally understand why the condition developed and counsel you more accurately about treatment and inheritance.

This is what genetic medicine should do:

reduce uncertainty and help us make better decisions.

About Dr. Nizamuddin Qasmi

Dr. Nizamuddin Qasmi is the **Founder & Chief Physician of Saira Health Care**, with a focused practice in sexual disorders and infertility.

His professional qualifications and additional training, as supplied for this article, include **BUMS from Hamdard University, Delhi; MD; CGO; Certificate in Infertility from MGBIMS, Delhi; Certificate in Urology – London, UK; Masters in Male Infertility**

by MasterHealthPro (HealthPro); and Integrated Sexual and Reproductive Health (ISRH, UNFPA).

At **Saira Health Care**, the approach to complex male infertility is intended to combine careful sexual and reproductive history, semen assessment, hormonal evaluation, identification of genetic risk, fertility counselling and individualized Unani supportive care.

When genetic testing, micro-TESE, advanced andrology, reproductive genetics, genetic counselling, IVF/ICSI or preimplantation genetic testing is required, appropriate specialist referral and coordination should form part of comprehensive care.

The Contribution of Saira Health Care in Sexual Disorders and Infertility

One of the important contributions a focused sexual and infertility clinic can make is to prevent different conditions from being treated as though they were the same.

Azoospermia is not simply “zero sperm.”

It can be obstructive or non-obstructive.

Severe oligozoospermia is not always caused by poor diet.

A man with normal sexual function can still have a serious genetic fertility disorder.

A patient with a Y-chromosome deletion should not receive the same counselling as a man with an acquired varicocele.

A man with CBAVD should not be treated in the same manner as a patient with Sertoli-cell-only syndrome.

At Saira Health Care, my goal is therefore to use the **cause of infertility as the foundation of treatment**.

This is also where modern genetics and the Unani principle of **Izala-i-Sabab** can meet conceptually: both ask us to identify the reason behind the disease rather than repeatedly treating the visible symptom alone.

Conclusion

Genetic Causes of Male Infertility represent one of the most rapidly developing areas of reproductive medicine.

The established causes include **chromosomal abnormalities, Klinefelter syndrome, structural chromosome rearrangements, Y-chromosome AZF microdeletions and CFTR-related congenital absence of the vas deferens**. Current guidelines provide

clear recommendations for karyotyping, Y-microdeletion testing, CFTR testing and genetic counselling in appropriately selected men.

The implications can be profound.

Complete AZFa or AZFb deletions can predict that testicular sperm retrieval should not be attempted.

AZFc deletion may still permit sperm retrieval but can be passed to sons.

CFTR-related obstruction can leave sperm production intact but requires partner testing and reproductive-genetic counselling.

Chromosomal translocations may increase the risk of miscarriage or chromosomally unbalanced pregnancies.

Klinefelter syndrome can involve both fertility and broader endocrine health.

At the same time, modern genomics is expanding the field beyond these traditional diagnoses. Exome and genome sequencing are revealing monogenic causes of NOA, globozoospermia, macrozoospermia, acephalic sperm syndromes, severe flagellar abnormalities and congenital reproductive endocrine disorders. A 2025 meta-analysis estimated approximately **15% diagnostic yield for exome sequencing in studied NOA populations**, while a 2026 systematic review showed substantially higher genetic yields in certain highly specific sperm phenotypes such as MMAF.

But genomics also creates new challenges.

Not every detected variant is disease-causing.

Variants of uncertain significance are common.

Some gene-disease relationships remain based on only one or two studies.

Therefore, genetic testing should be interpreted by qualified professionals and linked to the patient's actual reproductive phenotype.

From the **Unani perspective**, the principles of **Izala-i-Sabab, Ilaj-bil-Ghiza, Ilaj-bil-Tadbir and individualized Ilaj-bil-Dawa** can provide a useful supportive framework for whole-person reproductive health. Official CCRUM material emphasizes cause-oriented and holistic treatment.

However, scientific responsibility requires one clear limitation:

A chromosome abnormality or pathogenic DNA mutation cannot currently be corrected by a Unani medicine, supplement or lifestyle change.

The useful role of integrative care is to identify and optimize the factors that **can** be changed—nutrition, metabolic health, sleep, smoking, stress, sexual well-being and

general health—while modern reproductive genetics addresses the actual inherited or chromosomal condition.

At **Saira Health Care**, my preferred approach is therefore:

identify the reproductive phenotype, confirm the diagnosis, perform genetic testing when clinically indicated, explain the inheritance risk clearly, correct modifiable factors, use individualized Unani supportive care responsibly and involve modern reproductive technology or genetic specialists when that provides the most appropriate pathway.

I especially want patients to remember one thing:

A genetic infertility diagnosis is not a judgement on your masculinity and it is not automatically the end of biological parenthood.

In some genetic disorders, sperm can still be found.
In others, hormonal treatment may restore spermatogenesis.
In obstructive genetic disorders, sperm retrieval may bypass the missing duct.
And where a genetic disorder can be transmitted, modern genetic counselling can help the couple understand their reproductive choices.

The purpose of genetic testing is not to create fear.

Its purpose is to replace uncertainty with information—and use that information to make better treatment and family-planning decisions.

Saira Health Care: https://www.sairahealthcare.com/

Medical Disclaimer: This article is intended for medical education and patient awareness and does not replace individualized examination, genetic counselling or fertility treatment. Genetic tests should be selected and interpreted in the context of semen findings, hormonal results, physical examination, family history and the couple's fertility circumstances. A variant identified on a commercial genetic panel does not automatically prove causation. Patients should not undergo hormone treatment, surgical sperm retrieval, IVF/ICSI, PGT, herbal therapy or Unani treatment solely on the basis of online information. When a clinically significant genetic abnormality is identified, qualified genetic counselling is strongly recommended before reproductive decisions are made.