PHARMACOTHERAPY OF SPERM AUTOANTIBODIES

Medications used in the treatment of antisperm antibodies.

About Pharmacotherapy of sperm autoantibodies

Pharmacotherapy of sperm autoantibodies is the treatment option of antibodies against sperm cells in males, utilizing the administration of drugs.

Sperm antibodies, or also antisperm antibodies (ASA) are antibodies that react with the antigens (surface molecules) of sperm cells (Pic. 1). Anti-sperm antibodies (ASAs) markedly reduce sperm quality, which can subsequently lead to male and/or female infertility. ASA have been considered as infertility cause in around 10–30% of infertile couples, and in males, about 12–13% of all diagnosed infertility is related to an immunological reason. However, these antibodies are also present in approximately 1–2.5% of fertile men and in 4% of fertile women; the presence of ASA in the fertile population suggests that not all ASA cause infertility.

Risk factors for the formation of antisperm antibodies in men include the breakdown of the blood-testis barrier, trauma and surgery, orchitis (inflammation of the testis), varicocele (enlargement of the venous plexus draining blood from the testis), infections, prostatitis (inflammation of the prostate), testicular cancer and unprotected anal or oral sex with men.

Pharmacotherapy is often the first-line treatment of antisperm antibodies. However, its efficacy is limited. Corticosteroids were traditionally used as a treatment of infertile patients with anti-sperm antibodies. Their immunosuppressive effect (reducing the activity of immune system) was thought to reduce the amount of circulating antibodies and thus improve fertility. However, they are effective in only about 20% of males, and their long-term use is associated with a number of adverse effects.

The immune modulator (a drug modifying the function of the immune system) zinc sulfate (ZnSO4) presents reduced systemic side effects and could be used as an alternative for corticosteroids. Low zinc levels in body have shown negative effect on concentration of testosterone (the primary male sex hormone, needed for healthy sperm cell development) in serum. Also lower levels of zinc leads to decreased seminal volume. Concentration of zinc in seminal plasma is correlated with sperm density, possibly contributing a positive effect on spermatogenesis (sperm cell development). Treatment with zinc can improve sperm motility.

For patients who do not respond to pharmacotherapy, methods of removing ASA bound to sperm and methods of assisted reproductive technology (ART) are an option how to achieve a pregnancy. Methods of removing ASA include simple sperm washing and ejaculation directly into a washing buffer, which can minimize the amount of ASA coating the sperm. Intratubular insemination (IUI) may be useful for patients with sperm antibodies. However, the success of IUI cycles depends upon the method of sperm collection. When IUI fails, the techniques of in vitro fertilization (IVF) and intracytoplasmatic sperm injection (ICSI) offer better chances of achieving a pregnancy.

Success or failure factors

Pharmacotherapy of antisperm antibodies is limited by the possible adverse effects of corticosteroids that have been the mainstay of ASA pharmacotherapy. Because of their complex metabolic effects, corticosteroids should not be used in patients with a history of diabetes mellitus (as corticosteroids increase glycaemia, the blood sugar level), hypertension (corticosteroids may further increase blood pressure) or peptic ulcer.
Complications

Long-term use of corticosteroids, as the most commonly drug in pharmacotherapy of ASA, is associated with the risk of many side effects. The most common adverse effects of corticosteroids include:

- immunosuppression
- hyperglycaemia (elevated blood sugar) and increased insulin resistance, potentially leading to “steroid diabetes”
- skin fragility, easy bruising
- osteoporosis (reduced bone density) and bone fractures
- weight gain, especially on the torso
- loss of muscle mass
- suppression of the adrenal glands, and potentially adrenal insufficiency

Prognosis

Pharmacotherapy of sperm autoantibodies has been used as the first-line treatment in infertile male patients suffering from the condition. However, evidence suggests that administration of systemic corticosteroids is relatively ineffective, sufficiently reducing the level of antibodies in only about 20% of patients. For those who do not respond to corticosteroid treatment, methods of artificial reproduction technology may provide a possibility to achieve a pregnancy.

Find more about related issues

Diagnoses

Sperm autoantibodies
Antibodies that bind to sperm, inhibiting their movement, stopping recognition and entry into the egg.
Learn more at: www.fertilitypedia.org/therapy/diag/sperm-autoantibodies

Gallery

Pic
Human sperm cells in a false-coloured image from electron microscope.

Pic
Illustration of the seminal epithelium of the testis. Sertoli cells (7) protect the developing spermatozoa (3-6) by separating them from the bloodstream by tight junctions (8) among each other.
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