

Hormonal Estimation of Serum Levels of Gonadotrophic Hormones (FSH and LH) and Testosterone in Infertile Men

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Some of the proved reasons for male infertility are the congenital and acquired diseases of male reproductive system. They pass with changes in sperm analysis expressed with different levels of oligoastenozoospermy (II, III dg. or azoospermy) and are accompanied with alterations in hormonal statute-the level of reproductive hormones, which are characteristic for the definite clinical forms of hypogonadism. The aim of the present hormonal study is to differentiate certain types of hypogonadism in patients with fertile disorders. For the goal of the study hormonal estimation of 58 infertile men is carried out and serum levels of FSH, LH and Testosterone are determined. Results obtained from the study showed 39 patients are with normogonadotrophic hypogonadism, 14 — with hypergonadotrophic hypogonadism and only 5 — with hypogonadotrophic hypogonadism. On the basis of obtained results we can define the reasons for the certain type of hypogonadism and give trends in choice of therapeutical approach.

Key words: FSH, LH, Testosterone male infertility.

Some of the proved reasons for male infertility are congenital and acquired diseases of male reproductive system [6]. They pass with changes in sperm analysis, expressed with different levels of oligoastenozoospermy (II, III dg. or azoospermy) and are accompanied with alterations in hormonal statute-the level of reproductive hormones, which are characteristic for the definite clinical forms of hypogonadism. Hormonal regulation through hypothalamic-pituitary-testis axis is functionally conditioned and coordinated during all periods of sexual development in men — embryonal, fetal and postnatal periods, puberty, fertile age till andropause [1, 4, 5]. That's why hormonal problems in adults are of great importance. They are expressed with fertile disorders or sexual problems such as decreased erection, premature ejaculation or both [8]. Having in mind that infertility in men in 5 to 8 % is hormonally determined it is necessary paralelly with estimation of spermal indices to carry out basal hormonal profile with estimation of gonadotrophic hormones (FSH and LH) and Testosterone as a main androgen in men.

The aim of the present hormonal study is to differentiate certain types of hypogonadism in patients with fertile disorders and after that to point out the reasons for this kind of infertility and to recommend exact therapeutical approach.

Material and Methods

For the goal of the current study hormonal estimation of 58 infertile men is carried out and serum levels of gonadotrophic hormones — FSH, LH and Testosteron are determinated. Examinations are carried out in specialized hormonal laboratory. Serum levels of gonadotrophic hormones are detected using immunofluorescent methods (MEIA) in “IMX” apparatus-Firm Abbott, USA. Normal values are:

FSH: 1,00-12,00 mIU/ml

LH: 2,00-12,00 mIU/ml

Testosterone: 2,50-10,50*Testosterone is estimated using immunophotometric method on “Serosim” apparatus-Firm Serono, USA.

Results

From 220 examined men (for the whole period of time-2003 year), 160 are with fertile disorders, 60 are fertile [4]. From 160 infertile men, 58 are with deviations in hormonal statute, but 102 are without any alterations in hormonal statute. From 58 infertile men with hormonal disorders the data received from semen analysis showed changes in normal semen indices.

P. Kolarov (1968) and L. J. Rodrigues-Rigau (1983) proposed following classification of hypogonadism:

- Primary testicular insufficiency leading to hypergonadotrophic hypogonadism;
- Secondary testicular insufficiency leading to hypogonadotrophic hypogonadism;
- Tubular testicular insufficiency leading to normogonadotrophic hypogonadism.

According to this classification from 58 infertile men with hormonal deviations: 39 were with normogonadotrophic hypogonadism, 14 — with hypergonadotrophic hypogonadism and in 5 patients—hypogonadotrophic hypogonadism was observed. In the group with normogonadotrophic hypogonadism, consisted of 39 patients, the data received from semen analysis showed in 5 patients—azoospermy, 10 men — with oligoastenozoospermy III dg, in 16—oligoastenozoospermy II dg and 8 men were with low levels of Testosterone. The reasons for infertility are: oligoastenozoospermic syndrome, idiopathic varicocele, inflammatory diseases such as Hlamidia Trahomatis and Gonorrhoea, and noxious professional hormone-replacement therapy.

In the group of patients with hypergonadotrophic hypogonadism ($n=14$) the data received from semen analysis showed in 5 of them azoospermy and in 9 patients-oligoastenozoospermy III dg. Results received from hormonal study showed increasing serum levels of FSH and LH, leading by itself to structural and functional alterations. The most common reasons are cryptorchidism and pseudocryptorchidism, trauma and torsio testis. The therapeutical approach is hormone-stimulating and hormone-replacement therapy and in cases with trauma and torsio testis — surgical interference, as well.

Only in 5 patients hypogonadotrophic hypogonadism was observed and in all of them the results from semen analysis showed azoospermy and severe testicular

lesions affected seminiferous tubules expressed with suppressed and arrested spermatogenesis, affected peritubular tissue and process of peritubular fibrosis. All these alterations are based on secondary testicular insufficiency and therapeutical approach is hormone-stimulating and androgen therapy.

Discussion

The first group is consisted by most of the patients. The reason for infertility is the oligoastenozoospermic syndrome on the basis of tubular insufficiency, professional noxious and having inflammatory diseases —orchitis, orchiepididymitis as a reason for *Gonorrhoea*, *Chlamidia tracomatis* etc [1, 2]. Therapeutical approach is hormonostimulative and hormone-replacement therapy.

Changes in hormonal statute in second group with hypergonadotropic hypogonadism are based on primary testicular insufficiency expressed with structural and functional alterations based on bilateral pseudocryptorchidism, retractile testes and single cases with torsio and trauma testes [9, 10]. Therapeutical approach is surgery or hormonostimulative and hormone-replacement therapy.

In third group the reasons for hormonal changed statute is secondary testicular insufficiency expressed with absence of secondary sex signs, hypothalamic lesions, tubular insufficiency because of estrogenic disbalance, interstitial tubular insufficiency and therapeutical approach is hormonostimulative and androgen therapy [3, 5, 6, 7, 11].

Having in mind received data we can define the reasons for the type of hypogonadism as the trends in choice of therapeutical approach as well.

References

1. Bartke, A. et al. Relationship of the length of exposure to short photoperiod to the effect of prolactin on pituitary and testicular function in golden hamster. — *J. Reprod. Fertil.*, **69**, 1983, 587-95.
2. Eliasson, R. Clinical examination of infertile men. — In: *Human Semen and Fertility Regulation in Men*. (Ed. E.S.E. Hafez), St. Louis, Mosby, 1976, 321-331.
3. Garcia, Diez, L. et al. Enzyme and hormonal markers in the differential diagnosis of human azoospermia. — *Arch. Androl.*, **28**, 1992, 181-184.
4. Negro-Vilar, A., M. D. Lumkin. Inhibin: central and peripheral effects to regulate follicle-stimulating hormone secretion. — In: *Male Reproduction and Fertility* (Ed. A. Negro-Vilar), New York, Raven Press, 1983, 159.
5. Rodriguez-Rigau, L. J., K. D. Smith, E. Steinberger. A possible relation between elevated FSH levels and Leydig cell dysfunction in azoospermic and oligospermic men. — *J. Androl.*, **1**, 1980, 127-132.
6. Tzvetkov, D., P. Tzvetkova, L. Kanchev. Congenital anarchism: diagnostic and therapeutic aspects. — *Arch. Androl.*, **2**, 1994, 243-249.
7. Villarando, S., L. Mondragon, C. Baron. Role of testosterone and dihydrotestosterone in spontaneous gynecomastia of adolescents. — *Arch. Androl.*, **28**, 1992, 171-176.
8. Кацаров, М., В. Хаджидеков, М. Тодорова. Метод за диагностика на еректилната импотенция-спонгиография. — *Андрология*, **3**, 1994, 13—18.
9. Мартинова, Й., Л. Кънчева, Д. Цветков. Ултраструктура на тестис у човек при норма и крипторхизъм. — *Хирургия*, **1**, 1985, 17—23.
10. Протиц, М. et al. Крипторхизъм и фертилитет. — *Акуш. и гинекол.*, **1**, 1982, 62—66.
11. Цветкова, П., Д. Цветков, Л. Кънчев. Хормонални аспекти при първичен идиопатичен хипогонадизъм и инфертилитет. — *Андрология*, **2**, 1993, 11—17.