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Erectile Dysfunction in Men in Reproductive Age

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One of the enumerate reasons for sexual insecurency in a man and in a couple as a whole is the erectile dysfunction.We have the idea to examine ejaculates to determine the main characteristics of sperm and morphologically to investigate the biopsies of men with vascular disturbances such as idiopathic varicocele and testicular torsio.Material was received from testicular biopsies of 18 men in reproductive age and the applying of new modern apparatus-γ-chamber scintigraphy and echography in men with erectile dysfunction as idiopathic varicocele, trauma and torsio testis enrich the diagnostic possibilitites in andrologic practice.The different ethiological factors lead to one type morphological alterations in both testes, that are expressed with:trsansitional changes — hypospermatogenesis, desorganisation of germ cells, intratubular cessation of maturation. Peritubular matrix reacts to pathogenic factors with increasing amount of fibrous elements of matrix components.

Key words: erectile dysfunction, idiopathic varicocele, torsio.

Introduction

The reproduction of the population is a basic demographic index for each nation. Exsisting in Bulgaria and in many European countries unfavourable tendencies on basic demographic indexes as bearing, lethality, growth of the population, put the problem of human reproduction of a social significance. According to our data and findings, searching the facts for structural and functional changes characterizing the man in different ages in ontogenic aspect, show different characteristical specificities, that give us the reason to limit and differ corresponding age groups: early childhood, childhood, puberty, postpuberty, reproductive and sexual period of mature man, adult men — this period goes with partial androgenic deficiency (PADAM) and period of "aging man" — in this period andropause is in fact.

Aim of the study

We aimed to study morphological changes in testicular tissue that occur in pathological process such as erectile dysfunction in patients with vascular alterations: varicocele, torsio and trauma testis.

Material and Methods

Material was received from testicular biopsies of 18 men with varicocele, torsio and trauma testis. **Methods** – examination of local status of the patients:examining the external genitals in standing position; examining the external genitals in laying position.

Sperm analysis – including all sperm indexes: – volume of the ejaculates;number of the spermatozoa in 1 ml; speed of the sperm; motility; vitality test of spermatozoa; PH of the ejaculates; fructose in ejaculates; cells in ejaculates; light microscopy examination of ejaculates.

Special methods – noninvasive: testicular echography**semiinvasive** [9]; testicular scintigraphy (conventional and γ-chamber scintigraphy); **invasive:** Dopler's angiography of the penis, testicular biopsy.

We used classical histological technique for examination of testicular biopsies. Material was fixed in Bouen and then paraffine sections were prepared. Haematoxyline- eosine staining was applied, as other stainings as well – according to Masson, Azan, Gommory, etc. To distinguish the changes that occur in testicular peritubular matrix we used classical immunohistochemistry and slides were incubated with monoclonal antibodies against collagen type IV, desmin, α-SMA.

Results

In men with idiopathic varicocele are affected testicular veins "plexus pampiniformis". The reason for varicocele is genetic weakness of the vein's vessel wall. The idiopathic varicocele is a reason for surgical intervention after diagnosis because the main effect is to prevent break of spermatogenesis and sexual depression with following hormonal treatment. Scrotal hypothrophy and disturbed spermatogenesis are observed (Fig. 1). Proliferation of collagen fibres affected the elements of funiculus spermaticus, mainly musculus cremaster is in fact.

The torsion and trauma testis are the critical sitiations of so called acute scrotum and need an emergency surgical intervention-detrocvation to 4th hour of torsion to 180 degrees. If the surgical treatment comes late a difinative morphological alterations even of contralateral testis are observed as a reason of autoimmune processes and this aqired orhidopexy. The degree of testicular lesions correspond to the time and duration of the pathogenic factors. Pathohistological findings show adequate alterations in both testes. Hypospermatogenesis, dezorganization of germ cells are observed (Fig. 2, 4). Sertoli cells are enlarged prominating in the lumen of seminiferous tubules and tubules are with diminished lumen (Fig. 1). Around Leydig cells proliferation of connectiove tissue elements is observed (Fig. 3, 6, 7).Torsion or trauma testis is the situation of acute scrotum needing emergency surgical intervention. Affected circulation and irreversible changes lead soon to disappearance of seminiferous epithelium (germ cells) (Fig. 3).Germinal aplazia is in fact (Fig. 3). Changes are observed in Sertoli cells, the lumen is abnormally enlarged and the reason is changes in normal development of germ cells. The reason for destractive alterations in basal membrane is the fact that myofibroblasts are dislocated, degenerate and we can not observe them (Fig. 3, 4, 5, 7). In the interstitum we found local increasing of the number of Leydig cells (Fig. 7). The relationships between the basic elements of haematotesticular barrier are affected and changes of Leydig cells cause influence on autocrine and paracrine regulation of spermatogenesis.

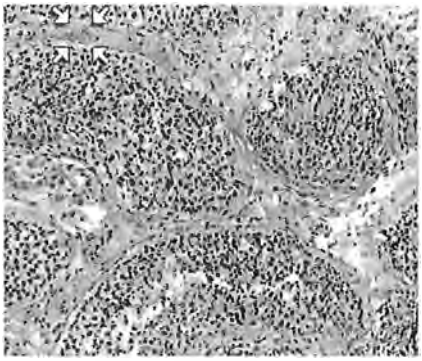

Fig. 1. Testicular biopsy. Idiopathic varicocele.Hypoispermatogenesis. Dezorganization of germ epithelium. Peritubular fibrosis. Haematoxyline-Eosine staining. × 200

Fig. 2. Testicular biopsy. Torsio testis. Hypospermatogenesis. Oligosoospermia II-III degree. Proliferation of collagen fibres in testicular peritubular matrix.Haematoxyline-Eosine staining. × 300

Fig. 3. Testicular biopsy. Azoospermia. Immunohistochemistry. Monoclonal anti-collagen type IV antibody. Possitive immune staining. × 400

Fig. 4. Testicular biopsy. Oligozoospermia III dg. Possitive immunostaining for alpha smooth muscle actine. Anti-alpha smooth muscle actine antibody. × 250

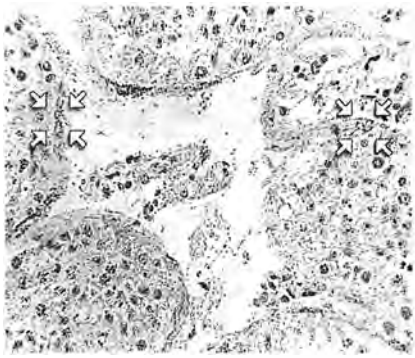

Fig. 5. Testicular biopsy. Oligoastenozoospermia III dg. Possitive immunostaibning for desmine and strong immune reaction in basal membrane and in the wall of blood vessels in testicular interstitium. × 300

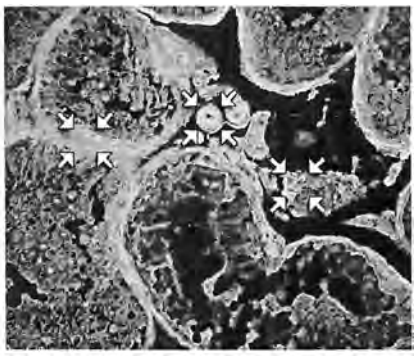

Fig. 6. Testicular biopsy. Strong immune reaction for alpha smooth muscle actine in peritubular tissue, around blood vessels and in testicular interstitium. Direct immunofluorescence. × 250

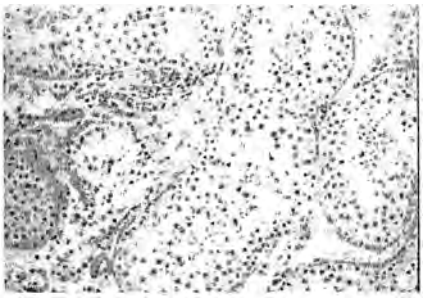

Fig. 7. Testicular biopsy. Testicular torsion (12th hour). Diminished lumen of seminiferous tubules, fractured basal membrane,dislocation of myofibroblasts, local proliferation of Leydig cells. Haematoxyline-Eozine staining. × 250

Discussion

Deseases leading to haematodynamic alterations affected male gonads related to male infertility and sexual problems take a real important place in androgenic and sexologic practice. Usually affected men are young (20-50 years old, in reproductive age). Testicular microvasculature is still not enough examined mainly in men with fertile problems. The most common diseases with vascular changes leading to erectile dysfunction are: idiopathic varicocele, priapismus, torsio testis, induratio penis plastica.

According to data in literature stress and intensification of life as some congenital alterations in male reproductive system cause troubles in human fertility [3,5]. Mainly in standing for a long period of time, walking, physical training or sexual excitement, patients with idiopathic varicocele have some troubles. Echography shows increasing the size of left testicular vein, the scrotum, does not show any assimetry. Enlarging of the veins are not observed. During the last stages of the disease clinical changes lead to pathohistological once of testicular tissue-hypospermatogenesis, disorganization of germ cells and intratubular cessation of maturation on the level of late spermatids, and the changes affect both testes. Some authors find changes in ultrastructure such as affected spermatogenesis-cessation of the maturation is in fact and they observed late spermatids [1, 4, 5]. Because of the defect of condensation of the chromatin a nuclear vacuole is formed and it takes place more than the half of the nuclear volume of the spermatid. This, on the one hand, will lead to damage of other stages of the cell differentiation and, on the other, will cause changes in the structure of the spermatozoa (so called teratozoospermia), [5, 6]. We comment this as a result of metabolic changes in spermatogenesis.

In men with torsio and trauma testis we have in mind cases with open and closed trauma, acute haemodynamic testicular changes and complications after herniotomy. The basic pathogenic mechanisms are direct testicular trauma, or acute disturbances in haemodynamics as a reason of affected circulation.While testicular torsion is incidently occurred as a disturbance of haemodynamics. In most patients schurgical intervention (detorquation) was done after 48th hour of torsion. This late surgical intervention we can explain with taking not seriously and critically the situ-

ation and the need of emergency surgical treatment. In all cases even in such when detorquation was done after 12 hour of torsion pathohistological findings show changes in both testes- germinal aplasia, Sertoli cell syndrome [6, 7, 8]. Peritubular tissue shows increasing of the fibrous elements of peritubular matrix,dislocation of myofibroblasts and in some places they cannot be observed [7]. On some places of testicular interstitium a local proliferation of Leydig cells is observed [2, 5]. Some authors [2, 4, 7, 8] give us information for ultrastructural changes — deformation and folding and thiked basal membrane. [5, 8] discussed about affected haematotesticular barrier and we support this facts with our data for dislocated myofibroblasts that we observed in our cases. Something more paralelly with morphological studies we provide examination of sperm and sperm analysis shows in severe cases aspermia. All this we can comment with severe irreversible changes in ipsilateral testes (morphological and functional alterations) followed by adequate changes in contralateral testes as an autoimmune answer. Changes in testicular interstitum — in number of Leydig cells lead to paracrine and endocrine changes in spermatogenesis.

Conclusions

Idiopathic varicocele in all ways need surgical treatment after correct diagnosis, because leads to disturbed spermatogenesis, sexual problems and depression, testicular torsion and trauma as situations of "acute scrotum" needing adequate surgical treatment as soon as possible (till 4th hour of torsion), as well.

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