Etiology, pathogenesis and epidemiology of spina bifida in children (Literature review)

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Annotation: In recent years, there has been an increase in congenital and acquired spina bifida in children, leading to disability and reduced reproductive function. The increasing number of men with fertility disorders, often having their roots in childhood, is increasing every year, forcing a comprehensive approach to solving the current problem. Among the most common pathologies, the leading place is occupied by varicocele , phimosis, cryptorchidism and hydrocele .

Key words: spina bifida, neurosurgical treatment, neurological disorders.

Introduction. Recent years have been marked by unprecedented progress in medicine, however, some asymmetry in the development of this process is of concern. On the one hand, this is admiration for the numerous and varied achievements of biotechnology, and on the other hand, an increasingly noticeable lag in those areas that, in fact, are priorities from the positions of biology, sociology, and even philosophy. We are talking about diseases of the reproductive system, most of which limit the fulfillment of the main species mission of a person - fertility. The basis of violations of the reproductive system are a variety of circumstances. However, the central place is given to medical and biological factors, in particular infertility, one of the causes of which is acquired, and more often congenital and hereditary spina bifida. In other words, the roots of many forms of reproductive disorders lie in childhood.

In recent years, there has been an increase in congenital and acquired spina bifida in children, leading to disability and reduced reproductive function [1].

The increasing number of men with fertility disorders, often having their roots in childhood, is increasing every year, forcing a comprehensive approach to solving the current problem.

Varicocele , phimosis, cryptorchidism, and hydrocele are among the most common pathologies [2].

Varicocele or testicular varicose veins is one of the andrological diseases that directly limits the ability to have children in the future. The essence of the disease lies in the fact that for a number of anatomical reasons, stagnation occurs in the area of the veins that “serve the testicle”, blood is poorly evacuated from the gonad and there are phenomena of lack of oxygen in it - hypoxia. The testicle stops its development, the development of germ cells - spermatozoa is disturbed. According to some authors, varicocele is found in 29% of infertile men [3, 4, 7].

According to JT Casey et al . in persons older than 15 years, the incidence of varicocele was 15%. It has been noted that the negative effects of varicocele are long-term and progressive: the number of spermatozoa, their mobility and morphology decrease, which can cause infertility in subsequent years [8].

T.M. Chirkina et al . analyzed the incidence of varicocele among patients of various age categories of adolescents: 10-11, 12-14 and 15-17 years old. Most often, the pathological process was diagnosed in patients older than 15 years [9]. This may be due to the fact that during puberty a number of hormonal changes occur, entailing an excessive load on the veins of the pampiniform plexus. The main mechanism of influence of varicocele on endocrine function and spermatogenesis is most often associated with an increase in temperature in the scrotum [5, 6].

Phimosis is a condition of the skin of the foreskin, which under no circumstances allows the glans penis to be exposed. Phimosis is formed due to the appearance of scar tissue in the area of the skin of the foreskin, which can never be stretched in any way. Often phimosis occurs due to the fact that in early childhood proper hygienic care for the foreskin was not provided. Sometimes it occurs as a result of chronic inflammation of the foreskin and glans penis [1, 11, 12].

According to Katsava N., the statistics of the current prevalence of phimosis is as follows: at the age of up to 6 months, phimosis is detected in 84.3% of children, at 2 years old - in 40%, and at 11–15 years old - 8.6% [10].

Cryptorchidism is an anomaly in the position of the testicle, due to a violation of its migration in the prenatal period from the abdominal cavity to the scrotum. To date, the pathogenetic mechanisms of cryptorchidism have not been finally established. Various anatomical and hormonal factors are involved in the process of gonadal descent from the site of primary anlage in the lumbar region through the anterior abdominal wall into the scrotum, and a violation of any stage can lead to a delay in testicular descent [1 3]. Cryptorchidism and infertility are connected, since in the process of its development the testicle does not receive the necessary potencies for laying the normal tubular apparatus.

Cryptorchidism can be diagnosed at any age, the incidence of the disease is up to 10-20% in newborns (up to 30% in premature newborns), up to 3% in one-year-old children, 1% in puberty and 0.3% in adults men [14, 15, 21, 22].

Taking into account the high prevalence of the disease and the pronounced negative long-term consequences, cryptorchidism is considered as a socially significant disease that has a significant impact on both the health of an individual and the demographic situation as a whole.

Hydrocele or dropsy of the testicular membranes is the accumulation of serous fluid in the vaginal cavity of the testicular membranes, between two sheets of its own

membrane. In the pathogenesis of the development of dropsy, the presence of communication with the abdominal cavity, the violation of the absorption of fluid by the walls of the vaginal process of the peritoneum, and the imperfection of the lymphatic apparatus of the inguinal region are important. As the child grows, dropsy may decrease and disappear. In older children, the causes of hydrocele and funiculocele are trauma, inflammation, iatrogenic disorders of the lymphatic apparatus of the testicle and its membranes due to surgical interventions for varicocele , neoplasms, etc. [16, 17, 23, 24]

Hydrocele occurs in 1.5 to 3.9% of cases in both boys and men of all ages. The problem of hydrocele is very relevant in the modern world, due to the wide prevalence of this disease and the lack of consensus regarding the choice of treatment method [18, 25, 26].

Also, one of the most common spina bifida of childhood is **edematous scrotum syndrome** . In the etiopathogenesis of the edematous scrotum syndrome, an important role is played by the morphofunctional immaturity of the reproductive apparatus and the disproportion in its growth rate [1, 19, 27, 28].

Until the end of the 70s of the 20th century, this pathology was treated conservatively, while the child was diagnosed with "acute orchitis". The treatment consisted of antibacterial, antihistamine therapy, novocaine blockade of the spermatic cord, physiotherapy, suspension with ointment bandages. The above treatment led to the subsidence of inflammation, the restoration of normal testicular size. But the study of long-term results of treatment revealed the development of atrophy of the affected testicle in 57-74% of cases. The causes of damage to the testicle in this pathology are damage to the suspensions, infringement, volvulus, and trauma to the testicle, requiring surgical intervention [19, 20, 29, 30, 31].

Despite the implementation of healthcare programs in recent years, the problem of the lack of uroandrological care for the children's population remains relevant.

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