lek. Marta Diana Komarowska

Temat: „***Rola wybranych czynników genetyczych, hormonalnych i środowskowych we wnętrostwie***”.

Summary

Cryptorchidism is the most common and long known congenital male newborn disorder. Data from recent years show that its etiology is complex. We are constantly seeking new factors that can affect the process of testicular descent. Therefore, the manuscripts included in the doctoral dissertation investigate the influence of hormonal (AMH, INSL3), genetic (single nucleotide polymorphism SNP receptor for AMH and AMHRII), and environmental (bisphenol A) factors on unilateral cryptorchidism.

Usually, cryptorchidism is considered a mild, asymptomatic defect; however, it is connected with a proven, increased risk of impaired fertility and development of testicular tumors, which surgical correction fails to eliminate. In most cases, treatment of cryptorchidism is completed in early childhood, when it is extremely difficult to assess the boys' fertility potential. Therefore, in one study we also determined antymüllerian hormone serum levels (AMH) and inhibin B as diagnostic markers of Sertoli cell function.

The research was carried out in groups of Polish boys, aged 1 to 4 years, with a diagnosis of unilateral cryptorchidism (n = 105). The control group (n = 58) consisted of boys in the same age group with unilateral inguinal hernia and without testicular disorders. A blood sample was taken in each case and a clinical examination of the undescended gonads was performed. Serum was used for hormone sampling and whole blood to determine single nucleotide polymorphism AMH Ile49Ser, AMHRII -482 A> G AMHRII IVS 10 + 77 A> G, and AMHRII IVS 5-6 C> T by isolation of total nuclear DNA and using a quantitative polymerase chain reaction and the TaqMan DNA probe system. Enzymatic immunoassay using commercial ELISA assays assessed the concentrations of hormones: AMH, INSL3, and inhibin B. We used gas chromatography mass spectrometery (GC-MS) to determine serum bisphenol A levels and its

various forms. In another paper, patients 12 months after orchiopexy were examined to assess the effect of surgery using clinical evaluation of morphology, location of the testes, and serum AMH concentrations.

The study shows that the concentrations of hormones AMH, inhibin B, and INSL3 did not differ between the groups. Also, the incidence of SNP did not differ significantly. Additionally, in all cases, AMHRII -482 A> G polymorphism was associated with the existence of AMHRII IVS 10 + 77 A> G and AMHRII IVS 5-6 C> T. The Fertility potential of children, in the prepubertal period, with unilateral cryptorchidism, evaluated on the basis of inhibin B and AMH, was not significantly different compared to a group of boys with normal gonads. On the other hand, orchiopexy did not affect the function of Sertoli cells - the concentration of its marker, AMH, hadn't changed significantly.

In another manuscript, we noticed higher concentrations of total and conjugated forms of bisphenol A in boys with unilateral cryptorchidism. BPA was found in each test sample, which confirms the widespread population exposure to BPA. However, we cannot answer the question which patients were more sensitive to the adverse effects of BPA and which patients would have impaired testicular descent.

Based on the survey in a population of Polish children, it can be said that in a complex analysis of hormonal, genetic, and environmental factors in the development of cryptorchidism it was found that the most common xenoestrogen (Bisphenol A) appears to play a significant role in the etiology of this disease.