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V. P. Pishak
M. O. Riznichuk

Bukovinian State Medical University
(Chernivtsi)

EPIDEMIOLOGY OF URINARY SYSTEM DEFECTS IN CHILDREN OF NORTHERN BUKOVYNA

Key words: *urinary tract, congenital malformations, fetus, children.*

Abstract. *The incidence and the dynamics of the frequency of congenital malformations of the urinary organs in the Chernivtsi region over the period from 2004 to 2008 have been studied. In newborns anomalies of the urinary system ranks fifth as far as prevalence is concerned (2,19‰). In prenatal diagnostics fetuses with anomalies of the urinary system occurred in women, living in the countryside – 66,7% of cases, namely, in the flat districts (34,9%) and fetuses of the male gender (63,5%). Urinary system abnormalities were detected mainly in the fetuses of women under 34 years of age (88,9%) during the first pregnancy (66,7%), accompanied with oligohydramnios (25,4%) and fetoplacental insufficiency (39,7%).*

Introduction

According to bibliographical findings the incidence of congenital malformations (CMs) of the urinary system ranges from 0,78‰ to 15,0‰, the proportion of the defects in newborns making up 0,63% [2]. V.N. Sbytnieva et al. [1] suggest that among children with CMs the population incidence of the urinary tract anomalies constituted 11,0%. K.S. Krasilnikova et al. [4] note that the share of the urinary system defects accounts for 20,7%, and in the general pattern of congenital anomalies the defects of the urinary tract are registered in 24,9% of the newborns. Anatomical defects predominated among them (81,5%): congenital hydronephrosis and ureteral doubling (31,3%), uni- and bilateral agenesis of the kidney (24,6%), megaureter (19,3%), hypo- and dysplasia of the kidneys (18,5%), polycystic kidney (13,3%) [6,7]. Risk factors were environmental and infectious ones, intrauterine fetal hypoxia and obstetrical pathology, mother's bad habits, gravidas' use of medicinal agents and others.

Having analyzed the outcomes of an examination of 11,000 children with CM in the Primorsky region D.M. [5] detected renal and urinary system anomalies in 3520 children (32%) among them. However, O.D. Kokorkin [2], V.L. Zelentsova et al. [3] point out that an early detection of congenital urinary tract pathology is at an insufficient level.

The purpose of the research

To analyze the incidence and pattern of congenital urinary tract malformations in newborns and fetuses of Northern Bukovyna.

Materials and methods

Newborn and fetuses with urinary system defects whose mothers permanently lived in the Chernivtsi region served as the material for this particular research. A research of congenital anomalies of the urinary system was carried out on the base of the Medical Genetic Center (MGC) of the Chernivtsi Regional Diagnostic Center (CRDC). A retrospective method of the research was used spanning the period from 2004 to 2008 by studying registration of genetic maps (form №149/ health) and reports of the CRDC of Ukraine's is MHP form №49-health "A report of rendering medicogenetic aid." We also used the data of an ultrasound examination of gravidas who applied to the Diagnostic Center and the results of their analyses. An ultrasound examination of women was performed during the terms of 11-16 and 16-28 weeks of pregnancy based on the program of mass screening to detect developmental defects in the fetus.

Over the period covered under study 51,129 newborns were involved into monitoring, in 115 (0,22%) cases defects of the urinary system were detected. Prenatal ultrasound screening detected 63 fetuses with congenital defects of the urinary system (CDUS).

The dynamics of the incidence of CDUS for each year and in comparison with the findings of the International Registry EUROCAT has been analyzed [8].

The population incidence of CDUS was calculated as the ratio of the number of live-births (LBs) and stillborn (SBs) with CDUS to the total numbers of live- and stillborn. The calculation was performed per 1,000 births.

We used the EUROCAT formula: The overall incidence of CMs = Number of cases with CMs

Table 1

The dynamics of the incidence of malformations in newborns of the Chernivtsi region

Nosology	Years					
	2004	2005	2006	2007	2008	average
Congenital renal defects	0,42	1,31	2,83	2,18	4,22	2,19
The number of defects	30,02	33,2	34,34	35,29	40,19	34,61

Table 2

A comparative incidence of the urinary tract congenital malformations in newborns according to the data of the registers of the Chernivtsi region and EUROCAT (per 1000 newborns)

Nosology	Regions					
	1	2	3	4	5	6
Congenital renal defect	2,19	2,32	8,24	1,37	2,12	2,15
The total number of defects	34,61	23,32	33,17	14,26	28,15	11,12

Note. 1 – the Chernivtsi region, 2 – Ukraine, 3 – Austria, 4 – Ireland, 5 – Malta, 6 – Portugal [8].

(LBs+SBs+IP) x1000 / The number of births (LBs+SBs), where LBs – live-births, SBs - stillborns, IP - interrupted pregnancy due to prenatally detected CMs with the body weight – 500 g during the term of pregnancy of 22 weeks or longer.

Results and discussion

51129 children were born during the period from 2004 to 2008 and 1777 children CMs among them were registered as having CMs of the general registration making up 34,61±3,31%. As far as prevalence is concerned, neonatal urinary tract anomalies rank fifth place (2,19%). The first place is occupied by CMs and deformities of the musculoskeletal system (17,2%), the second one - CMs of the circulatory system (4,6%) and the third – CMs of the reproductive organs (3,8%), fourth – multiple congenital defects (MCDs) (2,6%). The dynamics of the influence of MCMs over the period under study is adduced in Table 1.

The incidence of congenital anomalies of the urinary system has significantly increased by 10 times over the period under study that may be exlained by improved diagnostics of this particular type of defects.

The incidence of CDUS in the Chernivtsi region is mostly compared with the EUROCAT data and Ukraine (Tab. 2). At the same time, a growth of CDUS in Austria was observed.

While carrying out prenatal ultrasound screening 63 CDUS were detected, constituting 15,6% of the total number of all malformations. The greatest number of CDUS was diagnosed during the period of 16-28 weeks of pregnancy – 42 cases (66,7%), 2 cases being diagnosed (3%) up to the 16th week. In the fetuses of women who lived in the countryside CDUS occurred in 42 (66,7%) of cases, whereas in the residents of the city – in 21 (33.3%) cases. The incidence of anomalies of the urinary system in different districts of the region is present in Fig. 1.

Based on the gender CDUS were distributed as follows (Fig. 2).

As it is obvious from Fig. 2 urinary tract defects occurred more often in fetuses of the male gender – 40 cases (63,5%) of the flat districts of the region – 15 cases (23,8%). 23 cases were fetuses of the female gender (36.5%).

An analysis shows that CDUS prevailed in gravidas aged 34 years (88,9%), of whom up to 24

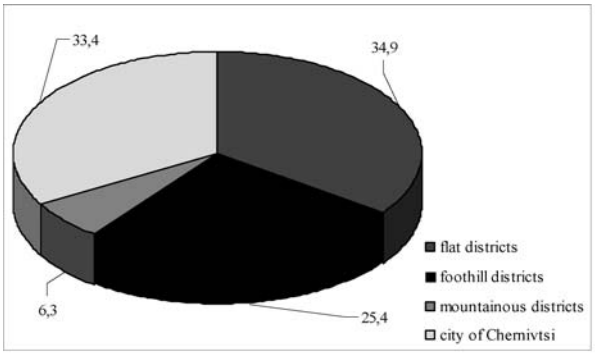

Fig. 1. The incidence of anomalies of the urinary system detected by prenatal screening depending on the place of mother's residence (%)

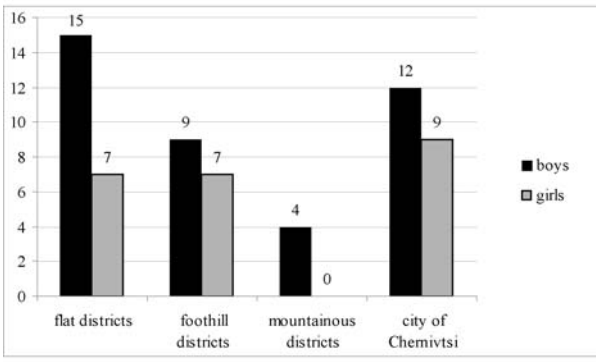

Fig. 2. The distribution of congenital defects of the urinary system detected by prenatal screening based on the gender (absolute numbers)

years – 30,1%, during the first pregnancy (66,7%) which was accompanied with oligohydramnios (25,4%), placental insufficiency (39,7%) and the risk of miscarriage (23,8%). Pregnancies with CDUS terminated by delivery in 81,0% of cases and with abortion in 10,9% accading to of medical indications.

Conclusions

1. Congenital defects of the urinary system in newborns rank fifth place as far as prevalence is concerned (2.19‰).

2. In prenatal diagnostics fetuses with anomalies of the urinary system occurred in women, living in the countryside – 66,7% of cases, namely, in the flat districts (34,9%) and fetuses of the male gender (63,5%).

3. Mostly the anomalies of the urinary system are primarily registered in women under 34 years (88,9%) during the first pregnancy (66,7%) that is accompanied with oligohydramnios (25,4%), fetoplacental insufficiency (39,7%) and a threat of abortion (23,8%).

Prospects for further researches

The high prevalense of anomalies of the urinary system in children requires measures as to timely prenatal diagnostic in gravidas and their primary prophylaxis.

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ЕПІДЕМІОЛОГІЯ ВАД СЕЧОВИДІЛЬНОЇ СИСТЕМИ В ДІТЕЙ ПІВНІЧНОЇ БУКОВИНИ

В.П.Пішак, М.О.Ризничук

Резюме. Вивчено частоту та динаміку частоти уроджених вад сечовидільної системи у Чернівецькій області за період 2004-2008 рр. У новонароджених аномалії сечовидільної системи займають п'яте місце за поширеністю (2,19‰). При пренатальній діагностиці плоди із аномаліями сечовидільної системи трапляються в жінок, які проживають у сільській місцевості – 66,7% випадків, а саме в рівнинних районах (34,9%) та в плодів чоловічої статі (63,5%). Здебільшого аномалії сечовидільної системи виявлені у плодів жінок віком до 34 років (88,9%), при першій вагітності (66,7%), що супроводжувалася маловоддям (25,4%) та фетоплацентарною недостатністю (39,7%).

Ключові слова: сечовидільна система, уроджені вади розвитку, плоди, діти.

Буковинський державний медичний університет (Чернівці)

ЭПИДЕМИОЛОГИЯ ПОРОКОВ МОЧЕВЫДЕЛИТЕЛЬНОЙ СИСТЕМЫ У ДЕТЕЙ СЕВЕРНОЙ БУКОВИНЫ

В.П.Пишак, Н.А.Ризничук

Резюме. Изучена частота и динамика частоты врожденных пороков мочевыделительной системы в Черновицкой области за период 2004-2008 гг У новорожденных аномалии мочевыделительной системы занимают пятое место по распространенности (2,19 ‰). При пренатальной диагностике плоды с аномалиями мочевыделительной системы встречаются у женщин, проживающих в сельской местности - 66,7% случаев, а именно в равнинных районах (34,9%) и у плодов мужского пола (63,5%). В основном аномалии мочевыделительной системы выявлены у плодов женщин в возрасте до 34 лет (88,9%), при первой беременности (66,7%), что сопровождалось маловодием (25,4%) и фетоплацентарной недостаточностью (39,7%).

Ключевые слова: Мочевыделительная система, врожденные пороки развития, плоды, дети.

Буковинский государственный медицинский университет (Черновцы)

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