

EPIDEMIOLOGY AND CLINICAL CHARACTERISTIC OF CONGENITAL DEFECT OF SUPPORTING-MOTOR APPARATUS AMONG NEW BORN IN ASTRAKHAN AND ASTRAKHANIAN REGION

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ABSTRACT — The exploration of gas complex for more than 20 years, which had high content of sulphur combinations, changed to worse the ecological condition in Astrakhan and Astrakhanian region. The statistic analysis for 15 years of congenital skeletal defects was made. It was found out, that the increase of dysplasia, congenital scoliosis and coxofemoral joint multiplied defects.

KEYWORDS — children, congenital defects of supporting-motor apparatus, ecology.

INTRODUCTION

The main medical and social problem of contemporary Russia is to preserve the health of nation in connection with real effect of depopulation (1), it means the usage of prophylaxis of morbidity among new-borns and the perfection of rehabilitative treatment of children with already formed defects (3, 5).

At present the physical development of children and teenagers from the point of ecosensitivity is taken into consideration as the main index of health level of population and quality of environmental media. The growing organism quickly react to unfavourable factors of environment, its reaction may not be simple. There were described out of level measures and non-proportional growth of long tubular bones during the period of growing impulses and disharmonic physical development of children (6) in the region of ecological unfavourability and defects of mineral metabolism (4). However, the most complex, real and demonstrative thing is the congenital pathology of supporting-motor apparatus (7, 8).

The congenital skeletal deformations take the second place in distribution after pathology of cardio-vascular system and the first in socio-economic significance among all defects of development. The children, having congenital deformations of supporting- motor apparatus, especially of spinal column, during a long period of time or the whole life, should be supplied by expensive operative means, apparatuses, orthoses and other appliances which may help them to study, to move and have an adequate way of live. It's



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necessary to remember about care, pay for sick-lists, various means, sanatory-resort treatment and so on. The above mentioned things explain the high interest of children surgeons and orthopedists to discovery reasons, characteristics and working-out the modern rehabilitative measures for children with congenital skeletal deformations.

The aim of present work is to define epidemiological parameters and clinical peculiarities of congenital defects of supporting- motor apparatus in ecologically unfavourable region — Astrakhan and its districts.

MATERIAL AND METHODS

There was made the investigation of supporting-motor apparatus condition of new-borns in the period from 1991 to 2011 years in populated places and centers of the Astrakhanian region, in maternity homes of Astrakhan. The investigated group included the children with defects of motor system development (spinal column, extremities, tendon-joint apparatus). There were studied the types of pathology, nosological forms, their distribution, variants of connection and combinations with other kinds of congenital pathology (other organs and systems).

For this purpose there was done the analyses of medical documentation in maternity homes №1 and №2, Astrakhan. Town's children clinical hospital №1 (neurological department and the department of newborn pathology, Regional children clinical hospital (orthopedic department)). There were chosen and analysed the cases of children with congenital defects of supporting-motor development, with the combined defects of development. There were 968 observations. The data from cases and register admissions, operative registers, analysis of X-rays in dynamics, other special types of observation (nucleo-magnetic resonance, computer tomography) were taken for study. The remote results of treatment using invitations for examination and repeated hospitalization were studied. For statistic analyses and mathematical work-out the received data was taken to the department of statistics of the Astrakhanian region.

The statistic work-out of data was done on the personal computer using specialized program for this purpose "Statistica 6,0" for "Windows-XP".

The other methods were used as: neuroinformatics, hybrid expert system in specialized program complex "AO-2009" made in scientific-producing unit of laboratory "New technology," Astrakhan.

RESULTS AND DISCUSSION

From the very beginning of existence of orthopedic science as an independent clinical subject the specialists' attention was focused on the congenital defects in the development of supporting-motor apparatus and their complications. Different, hard and combined deformations of bones and joints often made children become invalids, gave birth to serious social, medical and pedagogical problems of the society. It proved the doctors of various specialities, biologists and workers of health protection service to find ways and methods of early diagnostics, treatment and prophylaxis of this pathology. During the long period of observation there were found out and classified etiologic factors which were united as exogenous and endogenous. The previous researches showed that

serious disturbances of metabolism, biosynthesis and waste of components of collagenous and elastic fibers may appear under the influence of changeable factors of surrounding media and may lead to change of structure and function of connective tissue organs (2).

The present investigation showed the growing number of congenital defects especially the defects of skeleton.

The division in years and dynamics of quantitative data are given in the Table 1.

Table 1. Absolute data of congenital anomalies in Astrakhan and Astrakhanian region

Years	The whole number of new-borns	The number of diseases with congenital anomalies	
		The whole number	With the firstly stated diagnosis
1991	13938		1119
1992	12131		1221
1993	10384		1280
1999	9662	6219	1596
2000	10027	6109	1457
2001	10549	5997	1320
2002	11623	6339	1472
2003	12160	6847	1674
2004	12358	6913	1733
2005	12121	6822	1665
2006	12375	7154	2121
2007	13437	7358	2184
2008	14203	7424	1958
2009	14887	7636	2230

As it is seen from the given data there is the marked increase in number of children with CDD including SMA, the dynamics of it can be seen in Fig. 1.

The analysis of all nosologic forms of such pathology showed the most frequent cases of defects

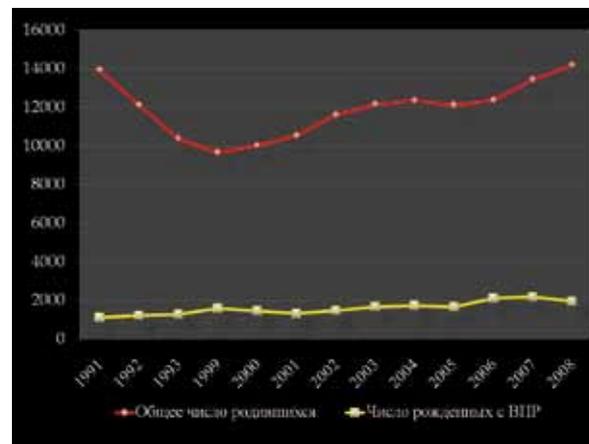


Table 2. The data of congenital defects development (CDD) in Astrakhan

The analysed year	General number of new-borns (GNNb)	The number of new-borns with CDD	The number of new-borns with CDD, % from GNNb	The number of new-borns with CDD of supporting-motor apparatus (SMA), n	The number of new-borns with CDD SMA, % from GNNb	The number of new-borns with CDD of SMA, % from CDD
1991	9499	454	4,78	66	0,69	14,54
1992	6971	632	9,07	79	1,13	12,50
1993	7461	591	7,92	81	1,09	13,71
1999	69,21	520	7,51	118	1,71	22,69
2000	7976	610	7,65	123	1,54	20,16
2001	7223	576	7,97	144	1,99	25,00
2004	8723	581	6,66	107	1,23	18,42
2005	8112	516	6,36	116	1,43	22,48
2006	9002	602	6,69	134	1,49	22,26

in supporting-motor apparatus, they were: dysplasia of coxofemoral joint, hand anomalies, torticollis, and deformation of chest. In 1991 the dysplasia of coxofemoral joints was 16,3%, in 1992 — 25,7%, in 1993 — it became 41,6% from the general number of congenital defects (CDD) of supporting motor apparatus (SMA). The diagnosis of torticollis was the same during the long period, its number was on the same level. At the same time the congenital talipes which had 30% in 1991 gradually decreased and to 1993 it had only 19% from the general pathology of motor organs.

In this period there was found out the definite member of rare severe combined skeleton defects such as arthrogryposis, chondrodysplasia, metaphysical chondrodysplasia, multiplied congenital dislocations of extremities. During the last 5 years this tendency preserved but there were some peculiarities. There were decreased numbers of talipes, but increased numbers of congenital scoliosis form, more cases when children were born with multiplied defects in development of supporting-motor apparatus, combined deformations, various syndromes. This group of children is united in the column "others" and may demonstrate stable tendency to growth. The number of children with congenital defects of SMA has 1,48%.

The districts of the Astrakhanian region having different geographical location and remote space from the main source of pollution have various chemical load. According to data of main department of natural resources and protection of environment in Russia in the Astrakhanian region it may be considered to be the most polluted parts such as: the Khasnyi, Ahtubinsk districts and Astrakhan itself. According to data the

highest degree of suffering had the districts nearest to sanitary-protective zone.

There was studied the distribution of congenital skeleton deformations in districts of the Astrakhanian region, as it gives the picture about epidemiology of pathological processes. The highest number of defects of supporting-motor apparatus was observed among inhabitants of the town during the whole period of investigation. It was stated that the unfavourable districts of the region were — Narimanov (6,1 to 14,2%), Privolzhskiy (5,4 to 7,5%), Krasnyi Yar (3,7 to 8,2%).

CONCLUSION

The analysis of statistical indexes, retrospective analysis of medical papers and clinical observation may give the possibility to come to the conclusion concerning the increase of CDD, especially dysplasia columna vertebralis anomalies, change of structure to the growth of multiplied deformations. The investigation of CDD in the districts of region discovered unfavourable zones of distribution of children with congenital development defects of supporting-motor apparatus that shows the necessity to find exogenous reasons and etiological factors connected with location, climate, etc.

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