STUDY OF PREVALENCE AND BIRTH DEFECTS TYPES IN THE CHILDREN FROM TWO DEVELOPMENT REGIONS OF ROMANIA: NW AND SW

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Abstract: *The aim of the present paper is to assess the prevalence of the various types of birth defects found in the children from two development regions of Romania: NW and SW, between 2003 and 2007. During this period of time, in the Departments of Paediatrics and Paediatric Surgery in Cluj-Napoca and Craiova, a number of 1460 cases of developmental malformations and anomalies were diagnosed, compared with the number of live births reported in that period, resulting a global prevalence of 0.6%, significantly higher (p <0.01) in the NW area (0.688%) compared with the SW region (0.476%). According to their types, the most frequently encountered malformations have interested the digestive system (35%) and the uro-genital system (26.3%), the lung being the most under-represented (1.3%). Comparative data are presented on the counties belonging to the two regions, as well as the discussion on the event of a relationship between the prevalence of congenital malformations and the employment of the labour force and the industrial development specific to the two regions.*

Cuvinte cheie: *malformaţii congenitale, copii, prevalenţă, tipuri*

Rezumat: *Scopul lucrării a fost acela de evaluare a prevalenţei şi a tipurilor de malformaţii congenitale constatate la copiii din două regiuni de dezvoltare ale României: NV şi SV, în intervalul 2003-2007. În acest interval, în Clinicile de Pediatrie şi Chirurgie Pediatrică din Cluj-Napoca şi Craiova s-au diagnosticat 1460 de cazuri de malformaţii şi anomalii ale dezvoltării care, raportate la numărul de născuţi vii din respectivul interval, dau o prevalenţă globală de 0,6%, semnificativ mai mare (p<0,01) în regiunea NV (0,688%), comparativ cu regiunea SV (0,476%). Ca tipuri de manifestare, cel mai frecvent au interesat aparatul digestiv (35%) şi uro-genital (26,3%), cele bronho-pulmonare fiind cele mai slab reprezentate (1,3%). Sunt prezentate şi date comparative, pe judeţele aparţinătoare celor două regiuni şi se discută eventualitatea unei relaţii între prevalenţa malformaţiilor congenitale şi gradul de ocupare a forţei de muncă şi de dezvoltare industrială specifice celor două regiuni.*

INTRODUCTION

Normal morphogenesis and embryo-foetal functional development according to the developmental schedule contained in the zygote results in the birth of a normal healthy child with a good postnatal development.

Congenital anomalies, the terminology used in parallel with the term of congenital malformations involve prenatal defects, highlighted at birth or later in life, consisting in deviations from the number, shape, relationship or common characteristics of a device, organ, tissue or cell, evocative to be registered as anomalies of development.

The congenital anomalies also include the malfunction, which is a pathological condition characterized by irreversible changes, dynamic or morphological of an organ or system existing at birth or occurring later in time, but due to antenatal conditions.

The remarkable complexity and fragility of the embryogenesis mechanisms are vulnerable to vast amount of context risk factors, causing a number of developmental abnormalities or malformations.(1)

Starting from the premise that the two development regions of Romania, show some differences related to their development and economic profile and also the employment of the labour force, we have set as an objective of this study the assessment of the prevalence of the various types of birth defects encountered in the children from the two development regions: NW and SW. The level of socio-economic conditions reflects the intensity and variability of occupational risk factors, potentially aggressive on individuals exposed at childbearing age. In another paper, we will present the data on the proportion of congenital malformations in relation to parental occupation. A better knowledge of the etiological factors that generate abnormal development constitutes the basic premise of their prevention.

PURPOSE OF THE STUDY

The purpose of the present paper is to assess the prevalence of the various types of birth defects found in the children from two development regions of Romania: NW and SW, in 2003-2007.

MATERIAL AND METHODS

This study comprises a total of 1460 patients with congenital defects from the two areas of development of Romania: the NW region, which includes the counties of Cluj, Bihor, Bistrita-Nasaud, Maramureş, Satu-Mare and Salaj, and the SW region, including the counties of Dolj, Gorj, Mehedinti Olt and Vâlcea. There have been analysed the observation sheets

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for the entire group of children with birth defects admitted between 2003 and 2007, from the existing archives of Surgery and Orthopaedics Paediatric Departments and the Paediatrics departments of no.1 County Emergency Hospital of Craiova and the Children's Clinic Hospital in Cluj-Napoca. We retained the data regarding the type of malformation diagnosed, the occupation of the parents, and any preconceiving contacts with toxic substances and use of maternal medications during pregnancy.

Congenital malformations recorded in both development regions were compared to the number of live births in each of the two regions between 2003-2007, using the existing relations from the database of the National Institute of Statistics.(2)

We have studied the prevalence compared between the two development regions and between two most industrially developed counties of each region, Cluj and Dolj and cumulatively for counties other than Cluj (NW), on the one hand, and counties other than the county of Dolj (SW), on the other part. The statistical processing was based on the difference between the frequencies using the chi square test.

Regarding the criteria for inclusion in the group, there were admitted only the cases of birth defects in live babies. We have excluded the cases of stillborn, cases where it would have been difficult to assess the real causes of perinatale mortality, many of these "creeping" outside of the statistics.

RESULTS

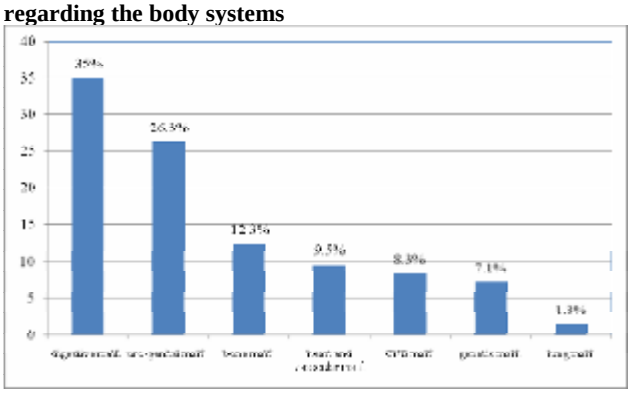
Of the 1460 observations with birth defects, 978 (67% of cases) belonged to the NW development Region and 482 cases (33%) to the SW region. Compared with the reported number of live births in the two development areas between 2003 and 2007, the global prevalence of congenital malformations was 0.6%. The prevalence was higher in the North West Region than in the South West region, these differences being statistically significant (P <0.01) (Table 1). The differences of the prevalence of congenital malformations are statistically significant, as well and in comparison of the counties of Cluj and Dolj (p <0.01), considered the most economically developed counties in the two regions. In the same table, lower prevalence is observed for counties other than the county of Cluj (NW region) or Dolj (SW region), with a statistically significant excess of prevalence for counties other than the county of Cluj compared with counties other than the county of Dolj.

Table no. 1. The prevalence of congenital malformations, compared to the two development regions and belonging counties, between 2003 and 2007

Development region / County	No. of malformations found	No. of live births	Prevalence	Significance of the differences
NW	978	142.070	0,688%	↑ p<0,01 ↓
SW	482	101.102	0,476%	
Cluj	414	30.942	1,33%	↑ p<0,01 ↓
Dolj	264	31.859	0,82%	
Others than Cluj	564	111.128	0,5%	↑ p<0,01 ↓
Others than Dolj	218	69.243	0,31%	

With regard to organs and systems where the malformations were observed in the entire batch of 1460 observations, as seen in the chart below, most affected was the digestive system (511 cases - 35%), followed closely by the uro-genital malformations (385 cases - 26.37%), while lung malformations were most underrepresented in our study (only 19 cases - 3%).

Figure no. 1. Proportions of congenital malformations regarding the body systems



In Table 2, we present in detail the types of malformations found in our study grouped by body systems.

Table no. 2. The location and types of malformations observed

System	No. of cases	Types of malformations encountered	No. of cases
Digestive	511	billiary atresia esophageal atresia cleft lip Meckel`s diverticulum congenital abdominal wall defects diaphragmaal hernia ano-rectal malformations mega colon duodenal stenosis	15 58 92 23 120 18 57 34 94
Uro-genital	385	anorchidia undescended testis bladder extrophy congenital hydronephrosis renal hypoplasia hypospadias policystic kidney congenital single kidney posterior urethral valves	20 158 11 26 10 117 15 6 22
Bone	180	acondroplasy radial agenesis artrogriposys club feet polydactilia amniotic disease syndactilia	4 3 5 62 55 32 19
Cardio-vascular	139	ASD forearm hemangioma arm hemangioma thigh hemangioma bottom hemangioma facial hemangioma thorax hemangioma cystic limphangioma	27 8 3 14 3 10 14 2

		ACP Fallot`s tetralogy	18 40
CNS	122	hydrocephalia meningoceles mycrocephalia	25 90 7
Genetic Malformations	104	cystic fibrosis congenital mixœdema Down`s syndrome Klinefelter`s syndrome Turner`s syndrome	51 23 16 6 8
Pulmonary Malformations	19	adenoidal cysts congenital lobar emphysema pulmonary hypoplasia	5 6 8

DISCUSSIONS

The frequency of congenital malformations that occur nationally and internationally has important variations depending on the subjective and objective conditions, such as study period, geographical area etc. Both domestically and internationally, the exact status of congenital malformations is not sufficiently well defined, being a subject that arouses particular interest.(3) Major birth defects may occur in the general population with a frequency of approximately 3% of all live births.(4) If the examination is carried out with competence in the first two weeks, the frequency of congenital malformations reaches 4.5%, but it may increase to 7 to 8.7% if we include anomalies in early childhood and adolescence.(5)

In Romania, the incidence of congenital malformations between 2003 and 2007 is estimated at 1.3% of all births, but in this evaluation the dead newborn are also included, which were not covered by our study due to the reasons shown above. If we exclude deceased infants, the difference between the incidence of malformations found in the studied group and the incidence estimated nationally is statistically insignificant. From 2003 to 2007, there were 446 born dead babies in the Southwest region, respectively 940 in the Northwest region, according to the National Institute of Statistics.(2)

Our study revealed significant differences in the prevalence of congenital malformations for the two regions, the indicators being raised in the NW region. These differences could be an expression of the higher labour employment in this region, industrial profiles associated with the risk of potentially influencing the process of reproduction.(6,7) This assumption is also supported by the comparison of the two industrially developed counties and counties other than the county of Cluj (NW Region) and Dolj (SW Region).

CONCLUSIONS

The prevalence of congenital malformations in the NW and SW regions of Romania, cumulatively, in 2003-2007 was of 0.6% of all living babies superior statistically significant in the NW region (0.68%) compared with the SW region (0.476%) and slightly lower at national level.

Most of them were digestive malformations (35%), followed closely by the urogenital (26.3%), while the lung malformations were recorded with the lowest prevalence (1.3%). The results of the comparative study suggests a relationship between the prevalence of congenital malformations and the degree of industrial development and the employment of the labour force, suggesting possible relationships with parental exposures to risk factors on reproduction.

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