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Prevalence and Forms of Congenital Anomalies in Twins Born in Pomeranian District During the Period from 1.07.1997 to 31.12.1998

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Abstract. The authors have analysed the frequency and structure of congenital anomalies in children born in the Pomeranian district in the period from 01.07.1997 to 31.12.1998. Among a total of 28.361 births in that area, 748 (2.64%) were affected by congenital anomalies. Among 28.361 births, 620 (2.18%) were from multiple pregnancies. 23 (3.71%) among births from multiple pregnancies were affected by congenital malformations. The prevalence rate of inborn anomalies in births from multiple pregnancy in our area were higher (3.71%) in comparison to births from singleton pregnancy (2.61%). It implies that children born from multiple pregnancy are at higher risk of developing congenital anomalies.

Key Words: Multiple pregnancy, Infants, Congenital anomalies, Prevalence

INTRODUCTION

Congenital anomalies are a significant cause of perinatal mortality of neonates and fetuses. Congenital anomalies are also the second common factor affecting mortality rates in infancy. Perinatal mortality rate in Poland is one of the highest in Europe and reached 10.2‰ in 1997. Epidemiologists assess that 3% of newborns are affected by any of major congenital malformation and approximately 0.7% are born with the Syndrome of Multiple

Congenital Anomalies. Among congenital anomalies of known etiology, about 35% are due to gene defects and about 50% to environmental factors and genetic disorders. Because of so high influence of genetic disorders, it seems necessary to provide genetic counseling. Few Central and Regional Registers of Congenital Anomalies have been created in order to achieve this goal [3]. They are the main sources of information about prevalence, distribution and form of inborn malformation. There have been a few regional registers in Poland in the past. However there has been no one to create a register which could cover a significant part of the country. Therefore in 1997 The Polish Register of Congenital Anomalies (PRCA) was created. Nowadays PRCA encompasses 52.8% of the Polish territory inhabited by 46.8% of the population of the country. Its main purpose is to determine the type, prevalence and distribution of the inborn anomalies in Poland. Additionally to assess the causes of particular anomalies and create methods of active genetic counselling for families with a higher genetic risk. According to the authors [4, 8] twins could be a group at a higher risk of genetic anomalies. This is the reason why the issue of prevalence and structure are highly important in that group of newborn twins. These data can be also useful to estimate empirical risk of particular types of congenital defects.

At present both in Poland and abroad there are not many data regarding frequency of congenital anomalies in twins. Available data on this issue are neither complete nor profuse. Therefore our studies may be a good source of data on prevalence of inborn anomalies in twins.

The aim of this work is the analysis of prevalence of congenital anomalies in twins born in Pomeranian district in the period from 1.07.1997 to 31.12.1998 and determination of their pattern.

MATERIAL AND METHODS

The survey considered 28.361 children (including 27.741 singleton births and 620 multiple births) aged 0-2 years born in Pomeranian district in period from 01.07.1997 to 31.12.1998. Pomeranian district is an area of 22.902 km^2 inhabited by 1.731.800 people.

In order to estimate the prevalence of congenital anomalies the data from PRCA have been used. The sources of information were forms filled and sent from neonatal and paediatric wards. Congenital anomalies were diagnosed on the basis of clinical examination and investigations such as ultrasound scan (in case of anomalies in the abdomen), X-ray (in case of skeletal anomalies). When a genetic defect was suspected, kariotyping was additionally performed.

Among a total of 28.361 children born in Pomeranian district 748 cases of congenital anomalies were registered in PRCA, 23 were from multiple birth. The resulting prevalence and structure of the inborn anomalies were compared with the number of births from singleton and multiple pregnancies in the period covered by the research (data published by General Statistical Office and approximate data from Regional Paediatric Boards). This comparison has been made in order to estimate the prevalence of congenital anomalies in twins and singletons.

RESULTS

In the period from 1.07.1997 to 31.12.1998 in Pomeranian district 28.361 children were born (approximate data). In this group there were 620 twins, i.e. 2.18% of children born in that period.

Among 28.361 births there were 748 cases of congenital anomalies (Table 1), i.e. 2.64% of all births in the Pomeranian district. Among 620 twins there were 23 congenital anomalies, which is 3.71% of all twins born in that period. Having excluded children born from multiple pregnancies the prevalence of congenital anomalies from singleton pregnancies was 2.61% comparing to prevalence of congenital anomalies in twins, which was 3.71%.

The structure of congenital anomalies in surveyed children is presented in the table 2. The most common congenital anomalies in births from singleton pregnancies

Table 1 - Prevalence of congenital anomalies in children born in Pomeranian district in period from 01.07.1997 to 31.12.1998

Total number of births in period from 1.07.97 to 31.12.98 (n=28.361)	Children born in pregnancies			
	multiple		singleton	
	n	%	n	%
Number of children born with congenital anomalies (n=748=2,64% all births)	23	3.71	725	2.61
Number of children born without congenital anomalies	597	96.29	27.016	97.39
Together	620	100.0	27.741	100.0

Table 2 - The structure of congenital anomalies in children born in Pomeranian district in period from 1. 07.1997 to 31.12.1998

Type of anomalies	Singletons		Twins	
	n (n=725)	%	n (n=23)	%
Gastrointestinal system	92	12.7	4	17.4
Cardiovascular system	218	30.0	7	30.4
Musculo-skeletal system	262	36.1	3	13.0
Genital abnormalities	102	14.0	1	4.3
Neural tube	64	8.8	3	13.0
Urinary system	52	7.2	2	8.7
Chromosomal defects	47	6.5	2	8.7
Syndrome of multiple congenital anomalies	47	6.5	1	4.3

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were those of musculo-skeletal system (36.1%), cardiovascular system (30.0%) and genitourinary system (14.0%). However in births from multiple pregnancies the most frequent anomalies affected the cardiovascular system (30.4%), gastrointestinal system (17.4%), neural tube (13.0%) and musculo-skeletal system (13.0%).

DISCUSSION

In the period from 1.07.1997 to 31.12.1998 in Pomeranian district 28.361 children were born (approximate data). In 748 births (2.64%) congenital anomalies have been diagnosed.

This prevalence approximates the prevalence reported by Ramos-Arroyo [6] for the Spanish population. A similar result (2.06%) is also given by other European countries working in the EUROCAT programme [3]. The prevalence of congenital anomalies for children born from singleton pregnancies in our district reached 2.61%.

The frequency of twin births varies from country to country. The lowest rate (below 1%) is in China and the highest in African countries (5% -Nigeria). For Europe this value averages between 1.25% and 1.45%.

In the analysed period i.e. 01.07.1997 to 31.12.1998 in Pomeranian District 620 twins were born, which is 2.18% of total births. The prevalence of twins in the area of Pomeranian district was higher than the average for Europe.

In 23 from 620 children born from multiple pregnancies congenital anomalies were diagnosed. The prevalence of congenital anomalies in surveyed twins was 3.71%, so congenital anomalies were more frequent among twins than among singletons (2.61%). Our research confirms the theses postulated by some authors [8] that twins are at higher risk of developing congenital anomalies.

The analysis of the structure of congenital anomalies in surveyed children implied higher frequency of defects of musculo-skeletal system (36.1%), cardiovascular system (30.0%), genitourinary system (14%) and gastrointestinal system (12.7%) but lower risk of the Syndrome of Multiple Congenital Anomalies and chromosomal disorders in children born from singleton pregnancies.

Similar data are also given by Brown [1] and Kato and Fujiki [5]. However cardiovascular anomalies were the most common. The data released by EUROCAT [3] also advocate the highest prevalence of anomalies of the cardiovascular system, neural tube, gastrointestinal system, genitourinary system. According to EUROCAT data there is a higher prevalence of neural tube anomalies than our survey suggests.

The anomalies of cardiovascular system in births from multiple pregnancies were the most frequent (30.4%) in our research. The anomalies of gastrointestinal system (17.4%), musculo-skeletal system (13.0%) and neural tube (13.0%) were also relatively frequent. The genitourinary anomalies (4.3%) and the Syndrome of Multiple Congenital Anomalies were diagnosed less frequently. The results obtained by us are comparable to those of Kato and Fujiki [5] for the Japanese population. In their study the most common anomaly was that of the cardiovascular system.

This survey on prevalence and structure of congenital anomalies among twins born in Pomeranian district is a pioneering analysis in the area. Therefore, the available data can be also recognised as approximate. However we do hope that continuation of this

research supported by the Polish Register of Congenital Anomalies in the near future will allow complex analysis of variations in prevalence and pattern of anomalies in children born from singleton or multiple pregnancy.

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