Congenital anomalies: hospitalization in a pediatric unit

Anomalias congênitas: internações em unidade pediátrica

Anomalías congénitas: internaciones en unidad pediátrica

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ABSTRACT

Objective: To analyze the profile of children with congenital anomalies admitted to a pediatric unit.

Methods: This is a quantitative and retrospective research. The sample consisted of records of children aged from 0 to 12 years old who were hospitalized in the pediatric unit of the University Hospital of Londrina, Paraná, Southern Brazil, from 2007 to 2009. Data were collected by chart review processed in the Epi-Info® program, and they were submitted to descriptive statistical analysis.

Results: There were 282 first admissions of children with congenital anomalies. Of these, 130 (46.0%) required readmission totaling therefore 412 hospitalizations. The mean stay was three days. There was a male predominance, and the age range was from three to seven years old. The most frequent congenital anomalies were in the genital and urinary systems (19.6%), followed by cleft lip and palate (17.3%), and those of the circulatory system (16.2%). There were 269 surgical procedures to correct there anomalies.

Conclusions: This study underscores the epidemiological importance of congenital malformations, highlighting the need to prevent and control the triggering factors.

Key-words: congenital abnormalities; child health; hospitalization.

RESUMO

Objetivo: Analisar o perfil das crianças com anomalias congênitas em unidade pediátrica.

Métodos: Trata-se de uma pesquisa quantitativa e retrospectiva. A amostra constituiu-se dos prontuários de crianças de 0 a 12 anos que foram internadas na unidade pediátrica de um hospital escola público em Londrina, Paraná, de 2007 a 2009. Os dados foram obtidos por busca ativa aos registros processados no programa Epi-Info®, e submetidos à análise estatística descritiva.

Resultados: Ocorreram 282 primeiras internações de crianças com anomalias congênitas. Destas, 130 (46,0%) necessitaram de reinternações e totalizaram, portanto, 412. A média de internação foi de três dias. Houve predomínio do sexo masculino e faixa etária de três a sete anos. Entre as anomalias prevaleceram aquelas do aparelho geniturinário (19,6%), seguidas pelas fendas labiais e palatinas (17,3%) e pelo aparelho circulatório (16,2%). Foram realizados 269 procedimentos cirúrgicos para corrigir as anomalias.

Conclusões: Este estudo reafirma a importância epidemiológica das anomalias congênitas, apontando para a necessidade de prevenir e controlar os fatores desencadeadores.

Palavras-chave: anormalidades congênitas; saúde da criança; hospitalização.

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RESUMEN

Objetivo: Analizar el perfil de niños con anomalías congénitas en unidad pediátrica.

Métodos: Se trata de investigación cuantitativa y retrospectiva. La muestra se constituye de prontuarios de niños de cero a 12 años de edad, internadas en la unidad pediátrica de un hospital escuela público en Londrina (Paraná, Brasil), en el periodo de 2007 a 2009. Los datos fueron obtenidos por búsqueda activa a los prontuarios, procesados en el programa Epi-Info®, y sometidos al análisis estadístico descriptivo.

Resultados: Ocurrieron 282 primeras internaciones de niños con anomalías congénitas. De estas, 130 (46%) necesitaron de reinternaciones, totalizando, por lo tanto, 412 internaciones. El promedio de internación fue de tres días. Hubo predominio del sexo masculino y franja de edad de 3 a 7 años. Entre las anomalías, predominaron las del sistema genitourinario (19,6%), hendiduras labiales y palatinas (17,3%) y sistema circulatorio (16,2%). Se realizaron 269 procedimientos quirúrgicos para corrección de las anomalías. **Conclusión**: Este estudio reafirma la importancia epidemiológica de las anomalías congénitas, señalando la necesidad de prevención y control de los factores desencadenadores.

Palabras clave: anormalidades congénitas; salud del niño; hospitalización.

Introduction

Congenital Abnormalities (CA) include changes in structure, function or metabolism of the fetus, resulting in physical or mental abnormalities, which may be present at birth or manifest years later. They are single or multiple, of variable clinical importance, and usually relate to genetic, environmental or unknown factors, originated before birth[1-3].

Risk factors susceptible of primary prevention may act in the post-conception period. Their damage is produced early in embryogenesis, so preventive measures should be initiated in the pre-conception period. For this reason, planned pregnancies have a lower risk for CAs[3]. Some other risk factors for birth defects are advanced maternal age, previous child with congenital anomalies, misuse of drugs/medications, nutritional deficiencies and exposure of pregnant women to certain physical, chemical, biological, and environmental teratogen agents[3,4]. Among these, some were decreased with family planning programs, health education, rigor in drug sales, fortification of flour with folic acid, prenatal program, National Immunization Program and the National Neonatal Screening Program[3,5,6].

There are preventive methods for 70% of CAs in the country. Primary prevention occurs mainly in the preconception period and is directed to healthy people in order to prevent disease by reducing exposure to risk factors and susceptibility. As for secondary prevention, this is accomplished by means of early detection of these factors, usually in the prenatal period, avoiding evolution of diseases and sequelae. Tertiary prevention occurs mainly in the postnatal period, acts on sick people, avoids the complications of the disease through rehabilitation and surgical corrections, encompassing a multidisciplinary treatment in order to reduce the risks of complications and disorders[3].

Despite the efforts to reduce their incidence, CAs are gaining significant representation in infant morbidity and mortality. In the UK, a study conducted in 2005, found that perinatal problems and congenital anomalies were, respectively, responsible for 33.1% (1,818) and 17.3% (953) of the total of 5,496 neonatal deaths[7]. In 2010, the newsletter of the Office for National Statistics showed that the main cause of neonatal death in England and the United Kingdom was congenital anomaly[8]. In Brazil, CAs are the second leading cause of death among children under 1 year of age, accounting for 19.3% of cases[7]. Part of this finding results from advances in health care and sanitation, which contributed to falling rates of infant deaths from infectious, parasitic, and respiratory diseases, leading to a relative increase in deaths from congenital defects[2,9].

The chronicity of the disease is also emphasized as potentiating of the development of clinical complications, increasing the number of hospitalizations and readmissions, severity of events, besides the social, economic, and family impact[4,5]. Children with birth defects reveal complex situations with practical and everyday changes, mental anguish, abandonment, impaired emotional relationships, and differentiated and prejudiced interactions in the environment in which they live[4].

Thus, considering the prevalence of children with CA and the biological, psychological, and social impact to the patient, the family, and society, this study was performed with the aim to analyze the profile of children with CAs hospitalized at a Pediatric Unit of a University Hospital in Northern Paraná.

Method

This is a quantitative, retrospective, descriptive cross-sectional study held at Hospital Universitário de Londrina - HUL,

located in Londrina, state of Paraná, in the period from January 1st, 2007 to December 31st, 2009. HUL is a supplementary organ of Universidade Estadual de Londrina (UEL), considered a regional referral center of the Brazilian public Unified Health System (SUS) in the North of the State. It was accredited as a Child Friendly Hospital in 2000, and it has 34 pediatric beds and six beds in the Pediatric Intensive Care Unit.

The sample consisted of medical records of children aged zero to 12 years of age, who were admitted and remained hospitalized in the pediatric unit. The data were obtained by direct search on patient records, from the list provided by the Department of Statistics and Medical Records of the hospital.

The questionnaire used for data collection was divided into two blocks, the first addressing data regarding the identification of children: sex, age, and type of CA, the second with information related to admissions and readmissions of children: arrival date, departure date, length of stay, clinics involved, primary diagnosis, surgical procedures and outcome.

Variables were organized according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10). The data collected were processed electronically using Epi-Info®, and subsequently descriptive statistical analysis was performed.

This research followed the rules on research involving human subjects of Resolution 196/96 of the National Health Council, obtaining approval from the Research Ethics Committee (REC) and authorization of the Hospital, under n. 236/08. CAAE n. 0233.0.268.000-08.

Results

During the 3 years of study, there were 282 first admissions of children with CA. Among these, 130 (46.0%) required readmission, totaling 412 hospitalizations. The mean length of stay was 3 days. Among all records analyzed, only 33 (8.0%) had maternal data, which were from mothers of children who were born at the hospital under study.

Male sex totaled 66.9% of cases. Regarding age range, slightly more than half of the children were 3-7 years old (50.3%), followed by those with up to 2 years of age (26.1%). Regarding origin, 51.1% were from Londrina and 48.9% lived in other municipalities, of which 50.3% came from other regions of Paraná.

Pediatric Surgery was the clinic that hospitalized the greatest number of children with CA (44.3%), being ahead of General Pediatrics (25.0%) and Plastic Surgery (15.8%). The clinics that accounted for the greatest number of readmissions were also General Pediatrics and Pediatric Surgery (Table 1).

Table 2 - Congenital anomalies according to ICD-10 groupings

ICD-10* Groupings	n	%
Q00-Q07 CA nervous system	34	9.6
Q10-Q18 CA of the eye, ear, face, and neck	6	1.7
Q20-Q28 CA circulatory system	57	16.2
Q30-Q34 CA respiratory system	8	2.3
Q35-Q37 cleft lip and cleft palate	61	17.3
Q38-Q45 Other CAs digestive system	36	10.2
Q50-Q56 CA genitals	69	19.6
Q60-Q64 CA urinary tract	27	7.7
Q65-Q79 CA and congenital deformities of the musculoskeletal system	46	13.1
Q80-Q89 Other CA	7	2.0
Q90-Q99 Non classified chromosomal anomalies	1	0.3
Total	352	100.0

*Multiple malformations

Table 1 - Number of pediatric hospitalizations for congenital anomalies, according to the clinics, according to the number of hospital.

Clinic	1st	2nd	3rd	4th	5th	Total	
						n	%
Pediatric Surgery	132	30	10	5	5	182	44.3
General Pediatrics	53	24	15	8	3	103	25.0
Plastic Surgery	56	8	1	–	–	65	15.8
Neurosurgery	17	7	3	1	–	28	6.8
Orthopedics	17	7	–	–	–	24	5.8
Cardiology	5	–	–	–	–	5	1.3
Otorhinolaryngology	–	1	1	–	–	2	0.4
Ophthalmology	2	–	–	–	–	2	0.4
Neuropediatrics	–	1	–	–	–	1	0.2
Total	282	78	30	14	08	412	100.0

Table 3 - Causes of hospitalization of children with congenital malformations according to the ICD-10 chapters

Causes of hospitalizations*	n	%
Endocrine, nutritional, and metabolic diseases	3	0.9
Diseases of the nervous system	7	2.1
Diseases of the eye and adnexa	1	0.3
Diseases of the ear and mastoid process	1	0.3
Respiratory diseases	17	4.8
Respiratory diseases	11	3.3
Diseases of the skin and subcutaneous tissue	1	0.3
Diseases of the genitourinary system	21	6.2
Certain conditions originating in the perinatal period	8	2.4
Congenital malformations, deformations, and chromosomal abnormalities	249	74.1
Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified	15	4.7
Injuries, poisoning, and other consequences of external causes	2	0.6
Total	336	100.0

*Multiple causes

The most frequently found CAs were related to the genitals (19.6%), cleft lip and cleft palate (17.3%) and the circulatory system (16.2%) (Table 2). Hypospadias were the most frequent CAs in genital organs (62.3%), while the Atrial Septal Defects (ASD) had the highest percentage of occurrence in the circulatory system (22.8%). It was also observed that 20% of children had multiple anomalies, among which 17% resulted from associations of congenital Spina bifida with congenital hydrocephalus.

According to Table 3, the CAs were considered as cause of first hospitalization in 74.1% of these children. Other complications that resulted in hospital treatment were diseases of the genitourinary system (6.2%), highlighting pyelonephritis (38%), and respiratory diseases (4.8%), being pneumonia the most frequent (52.9%).

It can be observed that most of the admissions were for correction of the congenital defect. In total, 269 surgical procedures were performed, of which the most common were, respectively, correction of hypospadias (11.8%), palatoplasty (11.2%) and lip repair (9.3%). Furthermore, a significant number of children required more than one surgery (24.3%). Regarding the outcome of these admissions, there were six deaths (2.1%) and 276 hospital discharges (97.9%).

Discussion

Although regarded as important risk factors for CAs, maternal and perinatal data were limited in this research, a fact that was also described in a study conducted in the municipality of Maringá, state of Paraná[10]. This points to the need for improvement in the historic of the child and family, besides assistance at different times of pregnancy and childbirth, to prevent the occurrence of complications and birth of children with birth defects. On the other hand, the shortage of information is also evidenced in the Datasus official information systems, being supplemented with data from medical records that need to be improved[11].

The mean length of stay was lower than the observed in studies of pediatric hospitalizations in general, which shows an average of 4.7 days[12]. This could be due to the population characteristic of this research, which required elective surgical procedures of low complexity, with their congenital anomalies as the main cause of hospitalization.

In this study there was a predominance of males, unlike what was observed in the municipalities of Pelotas, state of Rio Grande do Sul[1] and Cuiabá, state of Mato Grosso[13], where there was a higher frequency among females with percentages of 51.9% and 63.0%, respectively. In maternity hospitals in Rio de Janeiro, the prevalence of CA was higher among boys (55.5%)[14].

In terms of age group, most children hospitalized by CA were from 3–7 years. In Paraná, there was a greater frequency of pediatric admissions among the age range from 1–4 years (32.0%)[15].

Another peculiarity of this research was that most of the children were originally from other municipalities. This is because the study hospital is a reference in the treatment of high-risk pregnancy and infant surgery, offering high-complexity assistance to the populations living in Londrina and other municipalities in the state of Paraná.

Hospital readmissions can be considered as an indicator of quality of care, because they reflect the impact of hospital care on the condition of the patient after discharge. However, it is believed that readmissions of children with CA occur because these patients present comorbidities and require surgery for correction and rehabilitation, often for life[11]. In this study, 68.9% of readmissions were due to CAs, unlike other study where the readmissions occurred for oncological reasons[16].

In this research, the majority of admissions were for correction of congenital defects, in which a significant number

of children required more than one surgery, resulting in a higher number of readmissions. This reaffirms the chronic aspect of anomalies, interfering directly with quality of life of the children and their families. Both require continuous care involving high costs, added to the family psychological trauma and difficulties in adapting to society[5].

Many institutions do not have the support structure that can provide appropriate care outside the hospital, with multidisciplinary rehabilitation services that assist in dealing with the limitations caused by CA[16,17]. A study with families of children with disabilities showed that the support network of the family changes after birth, prevailing the performance of health professionals (80%), particularly physiotherapists (85%)[18]. This generates a reflection on the existence and quality of care provided by health professionals and others, such as speech therapists, psychologists, occupational therapists, requiring major investments in infrastructure and human resources from health and education systems to establish rehabilitation and prevention of aggravations. There is also a reflect on the family socioeconomic cost because generally one of the members leaves his professional life to devote himself exclusively to monitoring the child during treatments and rehabilitation, reducing access to better financial conditions.

The family care and the care with the child with CA require multidisciplinary practice. In this context, health professionals play an important role along with parents, especially in relation to the orientation regarding physical care and preparations to return home, encouraging parents to take responsibility for the care of the child[3].

The genitourinary diseases were the second leading cause of hospitalization, possibly because they are complications of the most prevalent congenital anomalies in this study. It is also noted that the respiratory diseases reported in this study refer to complications arising exclusively from the CAs, so it differs from other studies in which these diseases appear as major causes of child hospital morbidity[16,19].

There were also different prevalences in the types of CA in other studies conducted in Brazil, in which deformities of the musculoskeletal system predominated, followed by defects in the nervous system and cleft lip and palate[2,17,20]. It is believed that this discrepancy arises from the different samples and research sites, including the present research. The diagnosis of the anomalies of the circulatory system, for instance, is usually done later, after hospital discharge and has a high cost for the service and a significant financial impact. The study conducted in Salvador, in 2003, showed that despite not being the group of main cause of hospitalization, which is also evidenced in the present study, some diseases of the circulatory system had the highest mean values of hospitalization permits for correction of atrial septal defects, in both sexes[16,21]. In the state of Rio de Janeiro, as in this study, there was a predominance of abnormalities of the genitourinary system, with a higher frequency in males[14]. The high social and economic cost of the CAs is reaffirmed, due to the treatment of comorbidities associated to the type, as well as the consecutive surgical interventions coupled with the larger number of pediatric hospitalizations and susceptibility to physical and psychological trauma of the child and the family.

The limitations of this research were the use of secondary sources, which can denote the underreporting of information, so measures for an appropriate record are necessary, in particular because it is a University Hospital.

The presented results allowed characterizing the profile of children with CA hospitalized at Hospital Universitário de Londrina, reaffirming its epidemiological importance. The chronicity of the anomalies and the need for constant care and recurrent hospitalizations should be highlighted, pointing to the importance of understanding the biopsychosocial impact of this condition for children and their families, which should be supported by a trained multidisciplinary health care team.

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