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ORIGINAL ARTICLE

Prevalence of congenital malformations in newborns in the Araucanía region

Prevalencia de malformaciones congénitas en recién nacidos de la región de la Araucanía

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What do we know about the subject matter of this study?

There are no reports of the prevalence of current congenital malformations in the Araucanía Region.

What does this study contribute to what is already known?

We describe the frequency of congenital malformations according to the ICD 10 classification and provide relevant information that helps to explain a significant part of neonatal and infant morbidity and mortality in the region.

Abstract

Annually, 7.9 million neonates in the world have developmental anomalies. Together with prematurity, they constitute the main causes of mortality during the first year of life in developed and developing countries. In Chile, the estimated prevalence is 3.9% of all live births. There are no reports on the prevalence of malformations in the Araucanía Region. **Objective:** to estimate the prevalence of congenital malformations at birth in neonates hospitalized in a Neonatology Service. **Patients and Method:** cross-sectional study. Reference population: 54,241 live births at the Regional Hospital of Temuco over a 10-year period. Cases came from the neonatology hospital discharge database according to the ICD 10 classification, from January 1, 2009, to December 31, 2018. Descriptive and analytical statistics were performed with the STATA 15 software**. Results:** 949 neonates with one or more congenital malformations were identified. The overall prevalence of neonates with malformations was 1.7%, the most prevalent being ventricular septal defect 40.9 x 10,000 live newborns (LNB), atrial septal defect 21.5 x 10,000 LNB, cleft lip and palate 14.0 x 10,000 LNB, congenital hypertrophic cardiomyopathies 8.1 x 10,000 LNB, and congenital rectal atresia and stenosis or absence of the anus 7.9 x 10,000 LNB. **Conclusions:** the overall prevalence of malformations is similar to that reported for the country. When analyzing by type, we found significantly higher incidences than those reported in previous studies.

Keywords:
CIE10;
Malformations;
Congenital Malformations;
Newborn;
Prevalence

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Introduction

The concept of congenital malformation is understood as an abnormal formation of a fetal structure present at birth, due to an underlying factor that alters the development, of genetic, epigenetic, or environmental origin. This term is the most used in the clinical setting, although it refers only to structural anatomical alterations. The concept of developmental anomaly is broader and includes alterations at the cellular and molecular level[1].

Congenital malformations are classified as minor and major, where the latter represents a significant medical or cosmetic impact and are never considered as a variation of normality[2]. According to recent studies, 10% of malformations are attributed to environmental exposure, including maternal pathologies, substance abuse, infections, medications, radiation, hyperthermia, exposure to chemicals, and uterine anomalies. Between 15% to 20% are caused by single genetic alterations, 5% by chromosomal abnormalities, and in approximately 65% to 75% the cause is unknown, which can be attributed to polygenic and multifactorial etiologies[3].

Worldwide, it is estimated that 7.9 million newborns present some type of developmental anomaly per year. These pathologies constitute, along with prematurity, the main causes of mortality during the first year of life in developed and developing countries[4]. According to data from the regional observatory of health and mortality of the Pan American Health Organization, congenital malformations have been the second leading cause of infant mortality for more than 20 years[5]. In Chile, among the main causes of neonatal death are congenital malformations, chromosomal anomalies, prematurity, and neonatal sepsis[6].

The Latin American Collaborative Study of Congenital Malformations (ECLAMC), which included a cohort of 2,406,407 births between 1995 and 2008, reports a prevalence of major congenital malformations for the region of 2.7% of all live newborns (LNB) and 3.1% for Chile, highlighting in our country a low incidence of anencephaly and spina bifida in the period studied, but a high overall incidence of malformations[7]. Subsequent reports using ECLAMC data show a prevalence in Chile between 2001 and 2010 of 3.9% of all live births[8].

Based on the results of a population-based ecological study using data from the Department of Statistics and Health Information (DEIS) and the National Institute of Statistics (INE), Dipierri et al. identified a disparity in mortality due to congenital malformations between the different regions of Chile, especially in the south of the country[9]. According to data available in the DEIS, during 2012 the mortality rate for congenital malformations in the Araucanía Region was 6.2 per 100,000 inhabitants and, in this same year, there were 264 discharges of children under one year of age with congenital malformations from the *Hospital Regional Dr. Hernán Henríquez Aravena*[10]. According to the 2016 National Registry of Congenital Anomalies (RENAC), the incidence in the Araucanía Region is 1.2%[11].

The objective of the study is to describe the prevalence at birth of congenital malformations in neonates born at the *Hospital Regional Dr. Hernán Henríquez Aravena* of Temuco and hospitalized in the Neonatology Service of the same hospital, according to type and ICD 10 classification, between January 1, 2009, and December 31, 2018.

Patients and Method

Design

Cross-sectional study. Reference population: 54,241 LNB born at the *Hospital Regional Dr. Hernán Henríquez Aravena* of Temuco in 10 years, between January 1, 2009, and December 31, 2018.

Sample

Newborns with diagnosis of congenital malformation hospitalized in the Neonatology Service and born at the *Hospital Dr. Hernán Henríquez Aravena*, between 2009 and 2018. Neonates referred from other hospitals in the region were excluded. Neonates with malformations who were not hospitalized were not included, nor were stillbirths, neonatal deaths, or miscarriages. ICD-10 was used to classify malformations by system and type. The information was obtained from a database of anonymized clinical records. A genetic study was not available since only discharge diagnoses were analyzed.

Statistical analysis

Descriptive analysis of the subjects in the period studied (n = 949) was performed. Chi-square test, Student's T-test, and analysis of variance were used, with 5% of significance level. STATA 15 software was used. Prevalence was calculated considering as denominator the number of births at the *Hospital Regional Dr. Hernán Henríquez Aravena* of Temuco during the study period.

Ethical considerations

The study was approved by the Ethics Committee of the Southern Araucanía Health Service and authorized by the management of the *Hospital Dr. Hernán Henríquez Aravena* (HHA) of Temuco.

Results

During the period studied, 949 newborns were identified as having one or more congenital malformations, totaling 1494 malformations. Of these, 29.2% (n = 277) had prenatal diagnosis. The mean maternal age was 30 years ranging from 13 to 47 years. Table 1 describes the characteristics of the cases studied, presenting the total of malformations by system affected, with a breakdown of those with involvement of one or more systems.

Microcephaly was the most frequently reported diagnosis in central nervous system malformations with 38 cases. Of this group, 23 cases (60.5%) corresponded to small-for-gestational-age newborns and, of these, 19 (82.6 %) had a head circumference below 2 standard deviations for their gestational age. If all diagnoses associated with neural tube defects (spina bifida, anencephaly, occipital encephalocele, and other cerebral hypoplastic anomalies) are grouped, the prevalence is 12.9 per 10,000 LNBs (n = 70), surpassing microcephaly as the most frequent cause of central nervous system malformations.

There were statistically significant differences by sex in cases with genital organs and urinary system malformations. Small for gestational age (SGA) was significantly more frequent in the nervous system and genital organs malformations. Large for gestational age (LGA) status was significantly higher in the congenital heart disease group. Case fatality during hospitalization was 102 cases (10.7 %) and live discharges were 847 cases (89.3 %). A higher case fatality rate was observed in cases with respiratory, nervous, and urinary system malformations, which was statistically significant.

The total prevalence of neonates with malformations was 1.74% of the total live births. The prevalence of congenital malformations was 2.7% of LNB. 135 types of congenital malformations were reported. Table 2 presents in order of frequency the prevalence by system and type of malformation according to the ICD 10 classification. The systems that presented the highest proportion of malformations were the circulatory system accounting for 43.57% of the total malformations, followed by malformations of the central nervous system with 14.52%, respiratory system malformations with 12.98%, and the digestive system with 10.97%. The urinary system, musculoskeletal system, genital organs, eyes, face, and ears, and other malformations account for 17.96%. Of the total of subjects reported, 206 (21.7%) present a genopathy as discharge diagnosis. Of this group, 80 patients correspond to trisomy 21 (38.8%), 25 to trisomy 18 (12.1%), and 9 to trisomy 13 (4.3%). There were 92 patients (44.6%) classified as other genopathies not identified.

Discussion

In the studied period, the total prevalence of newborns with congenital malformations was 1.7% and, the total number of live births presented 2.7% of malformations. This prevalence is close to the data provided by the WHO, which in large population studies reports 2 to 3% of major malformations in all live births in developed countries and less than 6% in developing countries[12].In Chile, the ECLAMC reports a prevalence of 3.9% in 282,568 births with 10,925 cases of malformations between 2001 and 2010. In 2017, the national registry of congenital malformations for the Araucanía Region reports 1.2% which is lower than that found in this study[11]. This difference may be due to that the current data correspond to the perinatal reference center of the region, which concentrates the largest number of at-risk pregnant women.

According to the data reported by RENACH, the highest proportion of major malformations corresponded to the circulatory system with 32.9%, similar to that found in this study (43.5%), representing a prevalence rate for this group of 120 x 10,000 live births[11]. Within this system, most correspond to ventricular septal defect (34.1%) and atrial septal defect (18%), with a prevalence of 40.9 x 10,000 and 21.5 x 10,000 LNBs, respectively. These figures are similar to those described by other authors in Chile, which report a rate of 100 x 10,000 LNBs[13], and higher than those reported by the WHO for South America (28 x 10,000 LNBs)[12].

In this study, the second highest frequency was the central nervous system with 14.52% of malformations. It is noteworthy that microcephaly presents the highest frequency with 7 x 10,000 LNBs, which is not mentioned in the ECLAMC study. The second frequency in this group is spina bifida with 4.7 x 10,000 LNBs, which is slightly high compared with that reported in the ECLAMC series. A possible explanation could be the absence of primary prevention with periconceptional folic acid in our population given the high proportion of unplanned pregnancies (56.4%), according to figures reported in a previous publication by the same author[14].

Regarding the respiratory system, cleft palate presents the highest frequency with 14.1 x 10,000 LNB, similar to that described in ECLAMC. Diaphragmatic hernia presents 58.9 x 10,000 LNB, surpassing that reported by ECLAMC with 4 x 10,000 LNB, and surpasses esophageal atresia with 5.8 x 10,000 LNB compared with 2 x 10,000 LNB reported by ECLAMC. In the digestive system, anorectal malformation was present in 7.9 x 10,000 LNB, which is higher than that reported by ECLAMC with 6 x 10,000 LNB, however, it does not report gastroschisis, which stands out in this study with 6.6 x 10,000 LNB. In the genital organs, indeterminate

Table 1. Neonates with congenital malformations hospitalized in the Neonatology service, born at Hospital Dr. Hernán Henríquez Aravena, period 2009 – 2018 (n= 949)

	Total n (%)	Commitment of 2 or more systems n (%)	Gestational age (WMS) Birth weight (g) x̄ (DS)	Sex n (%) Female Male Not defined	Adequacy n (%) Adequate Big Small	Lethality n (%)
Central nervous system	167 (17.6)	51 (30.5)	36.4 (2.9) 2702 (893)	89 (55.3) 72 (44.7) 0 (0)	83 (53.4) 24 (14.9) 51 (31.7)*	26 (16.4)*
Eye, face, neck, ear	22 (2.3)	13 (59.1)	36.2 (3.9) 2612 (855)	17 (77.3) 5 (22.7) 0 (0)	17 (77.3) 0 (0) 5 (22.7)	0
Circulatory system	462 (48.7)	126 (27.3)	36.2 (3.6) 2761 (1108)	251 (54.3) 209 (45.2) 2 (0.4)	253 (55.0) 74 (16.0)* 134 (29)	46 (10.1)
Respiratory system	179 (18.9)	94 (52.5)	36.4(3.5) 2752 (926)	86 (48.0) 90 (50.3) 3 (1.7)	114 (63.7) 15 (8.4) 50 (27.9)	34 (19.4)*
Digestive system	148 (15.6)	52 (35.1)	36.4 (3.5) 2752 (926)	79 (53.4) 67 (45.3) 2 (1.4)	101 (68.2) 14 (9.5) 33 (22.3)	14 (9.7)
Genitalia	31 (3.3)	14 (45.2)	36.3 (3.3) 2648 (827)	12 (38.7) 14 (45.2) 5 (16.1)*	21 (67.7) 0 (0) 10 (32.3)*	7 (22.6)*
Urinary system	102 (10.7)	44 (43.1)	35.9 (3.5) 2622 (980)	41 (40.2) 58 (56.9)* 3 (2.9)	57 (55.9) 10 (9.8) 35 (34.3)	17 (16.8)*
Musculoskeletal system	40 (4.2)	30 (75.0)	36.6 (3.4) 2647 (917)	25 (62.5) 15 (37.5) 0 (0)	25 (62.5) 2 (5) 13 (32.5)	7 (18.9)
Other malformations	39 (4.1)	25 (64.1)	36.2 (3.2) 2589 (876)	17 (43.6) 20 (51.3) 2 (5.1)	21 (53.9) 2 (5.1) 16 (41.0)	3 (7.7)
Total	949	188 (19.8)	36.2 (3.5) 2769 (1004)	478 (50.4) 462 (48.7) 8 (0.8)	565 (59.6) 130 (13.7) 253 (26.7)	102 (10.9)

*p-value less than 0.05. Adequacy according to the Chilean growth curves of Alarcón-Pittaluga.

Table 2. Prevalence of congenital malformations x 10,000 live births. Neonates hospitalized in Neonatology service, born at Dr. Hernán Henríquez Aravena Hospital, period 2009 – 2018

	n	Rate x 10.000 RNV
Central nervous system	**217**	**40.0**
Q02 Microcephaly	38	7
Q05 Spina bifida	26	4.79
Q03 Congenital hydrocephalus	24	4.4
Q04.3 Other cerebral hypoplastic anomalies	23	4.42
Q04.0 Congenital malformations of the corpus callosum	22	4.05
Q04.6 Congenital brain cysts	21	3.87
Q04.9 Congenital malformation of the brain, not specified	18	3.31
Q01.2 Encephalocele occipital	8	1.47
Q03.1 Atresia of Magendie and Luschka holes	7	1.29
Q03.8 Other congenital hydrocephalus	7	1.29
Q04.2 Holoprosencefalia	7	1.29
Q00.0 Anencephaly	6	1.1
Q07.0 Arnold-Chiari Syndrome	5	0.92
Q07.9 Congenital malformation of the nervous system, unspecified	2	0.18
Q04.4 Opticoseptal dysplasia	1	0.18
Q04.8 Other congenital malformations of the brain, specified	1	0.18
Q06.1 Hypoplasia and dysplasia of the spinal cord	1	0.18

Eye, face, ear, neck	**28**	**5.16**
Q16.0 Congenital absence from the pavilion	7	1.29
Q16.1 Congenital absence, atresia, or narrowing of the ear canal	7	1.29
Q12.0 Congenital cataract	4	0.73
Q11.1 Other anophthalmias	3	0.55
Q13.0 Iris coloboma	2	0.36
Q17.2 Microtia	2	0.36
Q13.4 Other congenital malformations of the cornea	1	0.18
Q15.0 Congenital glaucoma	1	0.18
Q15.8 Other congenital malformations of the eye, specified	1	0.18
Circulatory system	**651**	**20.01**
Q21.0 Ventricular septal defect	222	40.92
Q21.1 Atrial septum defect	117	21.57
I42.2 Other hypertrophic cardiomyopathies	44	8.11
Q21.2 Atrioventricular septal defect	36	6.63
Q21.3 Tetralogy of Fallot	33	6.08
Q25.1 Coarctation of the aorta	22	4.05
Q25.4 Other congenital malformations of the aorta	21	3.87
Q22.1 Congenital pulmonary valve stenosis	16	2.94
Q25.6 Pulmonary artery stenosis	15	2.76
Q26.2 Total anomalous connection of pulmonary veins	13	2.39
Q22.0 Pulmonary valve atresia	10	1.84
Q25.5 Pulmonary artery atresia	10	1.84
Q20.4 Ventricle with double inlet	9	1.65
Q20.3 Discordance of the ventriculoarterial connection	8	1.47
Q23.4 Left heart hypoplasia syndrome	8	1.47
Q24.0 Dextrocardia	8	1.47
Q23.0 Congenital aortic valve stenosis	8	1.47
Q20.1 Transposition of the large vessels in the right ventricle	7	1.29
Q23.1 Congenital aortic valve regurgitation	6	1.1
Q89.3 Inversus Situs	6	1.1
Q20.2 Transposition of the large vessels in the left ventricle	5	0.92
Q22.4 Congenital tricuspid valve stenosis	4	0.73
Q22.6 Right heart hypoplasia syndrome	4	0.73
Q22.3 Other congenital malformations of the pulmonary valve	4	0.73
Q22.5 Ebstein anomaly	3	0.55
Q25.3 Aortic stenosis	3	0.55
Q26.3 Partial anomalous connection of pulmonary veins	3	0.55
Q22 Congenital malformations of the pulmonary and tricuspid valves	3	0.55
Q24.9 Congenital malformation of the heart, unspecified	2	0.36
M8903/0 fetal Rhabdomyoma	2	0.36
Q24.1 Levocardia	2	0.36
Q24.4 Congenital subaortic stenosis	1	0.18
Q25.7 Other congenital malformations of the pulmonary artery	1	0.18
I42.4 Endocardial Fibroelastosis	1	0.18
I44.2 Complete atrioventricular block	1	0.18

Respiratory system	**194**	**35.76**
Q35–Q37 Cleft palate and cleft lip	76	14.01
Q79.0 Congenital diaphragmatic hernia	32	5.89
Q31.5 Congenital laryngomalacia	21	3.87
Q39.1 Atresia of the esophagus	21	3.87
Q33.6 Hypoplasia and pulmonary dysplasia	20	3.68
Q30.0 Congenital malformations of the nose	7	1.29
Q33.8 Other congenital malformations of the lung	5	0.92
Q31.1 Congenital subglottic stenosis	2	0.36
Q32.3 Congenital stenosis of the bronchi	2	0.36
Q33.3 Agenesis of the lung	2	0.36
Q38.2 Macroglosia	2	0.36
Q31.3 Laryngocele	1	0.18
Q32.0 Congenital tracheomalacia	1	0.18
Q32.1 Other congenital malformations of the trachea	1	0.18
Q32.2 Congenital bronchomalacia	1	0.18
Digestive system	**164**	**30.23**
Q42.2 Absence, atresia and congenital stenosis of the anus	43	7.92
Q79.3 Gastrosquisis	36	6.63
Q41.0 Absence, atresia and congenital stenosis of the duodenum	23	4.24
Q41.2 Absence, atresia and congenital stenosis of the ileum	13	2.39
Q79.2 Exomphalos Omphalocele	11	2.02
Q40.0 Congenital hypertrophic stenosis of the pylorus	9	1.65
Q41.1 Absence, atresia and congenital stenosis of the jejunum	9	1.65
Q43.3 Congenital malformations of the fixation of the intestine	7	1.29
Q43.0 Meckel's diverticulum	3	0.55
Q43.1 Hirschsprung's disease	3	0.55
Q43.5 Ectopic anus	2	0.36
Q43.7 Persistence of the cloaca	1	0.18
Q44.0 Agenesis, aplasia and hypoplasia of the gallbladder	1	0.18
Q44.4 Bile duct cyst	1	0.18
Q44.6 Cystic liver disease	1	0.18
Q45.1 Annular pancreas	1	0.18
Genital organs	**31**	**5.71**
Q50.1 Developing cyst of the ovary	12	2.21
Q54 Hypospadias	10	1.84
Q56 Indeterminate sex and pseudohermaphroditism	9	1.65
Urinary system	**124**	**22.86**
Q62.0 Congenital hydronephrosis	39	7.19
Q62.5 Duplication of the ureter	23	4.24
Q61.4 Renal dysplasia	16	2.94
Q61 Cystic kidney disease	15	2.76
Q60.0 Renal agenesis, unilateral	8	1.47
Q63.1 Lobed, fused, horseshoe kidney	6	1.1
Q63.2 Ectopic kidney	5	0.92
Q60.6 Potter syndrome	4	0.73
Q62.3 Other obstructive defects of the renal pelvis and ureter	3	0.55
Q62.7 Vesic–ureter–renal congenital reflux	3	0.55
Q62.1 Atresia and ureter stenosis	1	0.18
Q64.4 Urachus malformation	1	0.18

Musculoskeletal system	**46**	**8.48**
Q74 Other congenital anomalies of the member(s)	7	1.29
Q74.3 Congenital multiple arthrogryposis	6	1.1
Q75.0 Craneosinostosis	5	0.92
Q76.4 Another congenital malformation of the spine	4	0.73
Q71.3 Congenital absence of hand and finger(s)	3	0.55
Q73.1 Phocomelia, unspecified member(s)	3	0.55
Q73.8 Other defects due to member reduction(s)	3	0.55
Q76.0 Spina bifida occulta	2	0.36
Q78.9 Osteochondrodysplasia, not specified	2	0.36
Q79.4 Prune belly syndrome	2	0.36
Q67.8 Other congenital deformities of the chest	1	0.18
Q71.8 Other defects due to reduction of the member(s)	1	0.18
Q72.8 Other defects due to reduction of the lower member(s)	1	0.18
Q75.1 Craniofacial dysostosis, Crouzon's disease	1	0.18
Q76.3 Congenital scoliosis due to congenital bone malformation	1	0.18
Q76.6 Other congenital rib malformations	1	0.18
Q77.1 Thanatophoric dwarfism	1	0.18
Q77.4 Achondroplasia	1	0.18
Q77.6 Chondroectodermaldysplasia	1	0.18
Other malformations	**39**	**7.19**
Q87.0 Congenital malformations that mainly affect facial appearance	14	2.58
Q87.1 Congenital malformations associated mainly with short stature	11	2.02
Q80 Congenital ichthyosis	4	0.73
Q87.2 Congenital malformations that mainly affect the limbs	2	0.36
Q87.3 Congenital malformations with excess early growth	2	0.36
Q89.0 Congenital malformations of the spleen	2	0.36
Q96 Turner syndrome	2	0.36
Q87.8 Other congenital malformation syndromes	1	0.18
Q89.2 Congenital malformations of other endocrine glands	1	0.18
Total	1494	275.43

sex corresponded to 1.6 x 10,000 LNB, a figure lower than that reported by ECLAMC with 2 x 10,000 LNB. In the musculoskeletal system, arthrogryposis presents the highest incidence in this study with 1.1 x 10,000 LNB and is lower than that reported by ECLAMC with 2 x 10,000 LNB. (8)

In this study, the malformations with the highest incidence are ventricular septal defect with 40.9 x 10,000 LNB, followed by atrial septal defect with 21.5 x 10,000 LNB, cleft palate and cleft lip with 14 x 10,000 LNB, other hypertrophic cardiomyopathies with 8.1 x 10,000 LNB, absent, atresia and congenital stenosis of the anus with 7.9 x 10,000 LNB, microcephaly with 7 x 10,000 LNB, atrioventricular septal defect with 6.6 x 10,000 LNB, tetralogy of Fallot with 6.0 x 10,000 LNB, congenital diaphragmatic hernia with 5.8 x 10,000 LNB, and spina bifida 4.7x 10,000 LNB.

In the case of microcephaly, we found in the literature a rate of 0.3 x 1,000 LNBs in Chile (15), while in this study, the rate was more than double (0.7 x 1,000 LNBs). We can point out that in this group 60.5% of the newborns are small for gestational age. However, when analyzing the head circumference of these patients, we found that 31 of 38 (81.5 %) had measurements below 2 SD for gestational age. Of the cases with small-for-gestational-age microcephaly, 19 of 23 (82.6 %) had a head circumference below 2 standard deviations for their gestational age. Therefore, according to the differences in definition, we could find a slightly overestimated figure.

It should be noted that, for the total group, the average gestational age at birth was 36 weeks, with the highest lethality in the cardiovascular malformations group.

This study has some limitations, for example, it only includes neonates with malformations that were born in the hospital and were hospitalized in the neonatology service, excluding some that did not need hospitalization and were only in the puerperium. For this reason, the prevalence of newborns with trisomy 21 is likely underestimated, considering that a non-negligible number are not hospitalized, which is not the case for trisomy 18 or 13. The regional hospital does not register data in RENACH from 2015 onwards so that information is not available. On the other hand, what is of most interest for the analysis of neonatal and infant mortality are the major malformations, which, with some exceptions, are almost all hospitalized. Some major malformations are currently not hospitalized and mothers are offered palliative care in the puerperium until their child's death. However, this approach started to take place after the years of the study, and thus, during the years analyzed, palliative care was provided in the neonatology service. Therefore, the child with a major malformation and not viable was also hospitalized.

Another element to consider is that the regional hospital receives pregnant women with a prenatal diagnosis of major malformations to be resolved in this hospital, the only tertiary-level hospital with NICU and neonatal surgery in the region, which may explain the high rates of some malformations such as diaphragmatic hernia and gastroschisis, given the improvement in prenatal diagnosis that the region has experienced in recent years.

Conclusions

We describe the prevalence at birth of malformations in patients hospitalized in the neonatology service and the distribution by systems affected, according to the ICD-10 international classification. The prevalence found is similar to that reported for Chile and by the WHO. When analyzed by type, we found that some prevalence rates were significantly higher than those reported in previous studies. Despite the limitations of the study, the prevalence rates described reflect the reality of the region, in the absence of other studies in the area, which is relevant when designing strategies to reduce neonatal and infant mortality, which has stabilized in recent years.

Ethical Responsibilities

Human Beings and animals protection: Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

Data confidentiality: The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

Rights to privacy and informed consent: The authors state that the information has been obtained anonymously from previous data, therefore, Research Ethics Committee, in its discretion, has exempted from obtaining an informed consent, which is recorded in the respective form.

Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

Financial Disclosure

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