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Functional and socio-demographic profile of patients with cerebral palsy in rehabilitation at a reference center in Salvador

Summary

Objective: To evaluate the functional and social demographic profile of patients with Cerebral Palsy (CP) treated at Hospital Santo Antônio, CER IV, of Obras Sociais Irmã Dulce.

Methods: During 11 months, patients with Cerebral Palsy were followed in study. All were evaluated according to sociodemographic, etiological, epidemiological, clinical and functional aspects as pre-established criteria for functional evaluation of the several systems and motor capacity. The data were stored in databases and processed by SPSS/IBM, version 21.

Results: Of the 59 patients, carriers of CP it was found presence of CP of Spastic type in 55/59 patients (93.2%), Dyskinetic in three/59 (5.1%) patients and ataxic type in 1/59 patient (1.7%). The etiology of CP corresponded in 6/59 (10.2%) to prenatal factors and in 18/59 (30.5%) to perinatal factors, with postnatal causes in 17/59 (28.8%). The age of the patients ranged from 1 to 16 years, with a mean of 6.7 years and a median of 6.6 years. There was a predominance of male patients (50.8%). Regarding the evolutionary aspect and functionality of the patients studied, the occurrence of more than one type of dysfunction per patient could be observed, with visual deficits standing out in the sensory aspect; in the higher functions, language and behavioral deficits with few reports of cognitive deficit. The motor aspect had expressiveness in its dysfunction where 67.7% of patients did not develop voluntary gait.

Conclusion: In the 21st century, CP is still incapacitating for neurodevelopment despite the medical advances in diagnoses and pre and perinatal interventions for the preservation of the lives of newborns. Early diagnostic measures are important to improve therapeutic efficacy with consequent improvement in the quality of life of these patients.

Keywords: cerebral palsy, etiology, functionality

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Introduction

Cerebral palsy (CP) or Chronic Encephalopathy of Childhood (CIE) is an encephalopathy of an essentially motor nature, sometimes associated with sensory and mental disturbance that seriously impacts the quality of life of patients and family members, and is a pathology of high social impact. The neuromotor impairment of this disease may involve distinct parts of the body, resulting in topographical classifications (quadriplegia, hemiplegia, and diplegia). Another type of classification is based on the alteration of the type of movement disorder that can produce the spastic, dyskinetic, or atetoid, ataxic, hypotonic, and mixed types. The severity of neuromotor impairment of a child with cerebral palsy can be characterized as mild, moderate, or severe based on the means of locomotion of the child.[1]

By definition, CP, according to what was proposed at the Oxford symposium in 1958, "is a persistent qualitative motor disorder due to non-progressive interference with brain development, manifesting in children up to 3 years of age.

With multifactorial etiology and in reality varying according to its subtypes and the period in which the motor cortex lesion occurred in a still immature nervous system, we find in its etiopathogenesis more prevalent risk factors such as: low birth weight, prematurity, and maternal affections. In general, ECI or CP result from prenatal factors, including infectious, toxic, vascular-anoxic, and genetic causes, and perinatal factors in general, resulting from anoxic and traumatic birth injuries. The postnatal causes are mostly related to the sequelae of meningoencephalitis.[2]

The incidence of cerebral palsy has been very high in recent years, and this fact is attributed to the survival of very low birth weight premature babies, where neurological disorders can reach 50% and the occurrence of CP is 25 to 31 times higher than in term births.[3]

Considering that CP is grouped by rehabilitation intervention of a multidisciplinary nature, where survival and improvement in the quality of life of its bearers occur thanks to early diagnosis and treatment, the following questions were asked about the aspects and evolution of physical therapy treatment in cerebral palsy in rehabilitation clinics in the city of Salvador.

Method

This is a case report study using a convenience sample of patients diagnosed with CP seen between September 2014 and July 2015 at the Centro Especializado em Reabilitação IV (CER IV) of the Hospital Santo Antônio in Salvador. The inclusion criteria were: meeting the pre-established criteria for the diagnosis of Cerebral Palsy and being aged up to 18 years at the time of admission to the service.

The diagnosis of Cerebral Palsy will be based on previously established and reviewed criteria, supported by its definition in the reference literature[1]. Data, including socio-demographic data, were collected from the patients' medical records, as well as clinical

data from the examination performed by a Neuropediatrician. All cases completed the epidemiological form. Data were entered into a database (SPSS 21.0) for statistical analysis. Frequency distributions and summaries of dispersion and measures of center were calculated, applicable to the variables.

Results

In the period from September 2014 to July 2015, data from a total of 59 patients were collected. The sample studied consisted of patients diagnosed with Cerebral Palsy in rehabilitation at the CER IV, of the Social Works of Sister Dulce, in the city of Salvador.

Table 1 shows 30/59 (50.8%) male patients and 29/59 (49.2%) female patients. The age of patients ranged from 1 to 17 years, with a mean of 6.7 years and a median of 6.6 years. The most prevalent age range was 4 to 8 years (42.4%), followed by the age range of less than 4 years (28.8%).

Table 1 Demographic data of patients with Cerebral Palsy (Rehabilitation Center IV at Hospital Santo Antônio - Set/2014 to Jul/2015)

Data	N	%			
Sex					
Male	30	50,8%			
Female	29	49,2%			
Age (range)					
< 4 years	17	28,8%			
4 to 8 years	25	42,4%			
8 to 12 years old	12	20,3%			
> 12 years	5	8,5%			
Age (years)					
Mean±SD	**Value minimum**	**Quartile 25**	**50th quartile**	**Quartile 75**	**Value maximum**
6,72 ± 3,84	1	3,5	6,6	9,9	17

The analysis of the sample cases selected from secondary data in the medical records of these patients from the CER IV indicated different types of CP: spastic, dyskinetic, and ataxic.

Spastic CP was present in 55/59 patients (93.2%), dyskinetic CP in 3/59 (5.1%) patients, and ataxic CP in only one patient (1.7%) (Table 2). Among cases with spastic CP, the quadriplegic form was found in 34/55 (61.8%) patients, the diplegic form in 12/55 (21.8%), and the hemiplegic form in 9/55 (16.4%).

Table 2 Types of Cerebral Palsy (Rehabilitation Center IV at Hospital Santo Antônio - Sep/2014 to Jul/2015)

Type	N	%
Spastic	55	93,2
Tetraplegic	34	61,8
Hemiplegic	9	16,4
Diplégica	12	21,8
Discinetics	3	5,1
Coreoatetoid	3	100
Ataxic	1	1,7

Outcome of the etiological aspects

From the etiological point of view of CP, as seen in Table 3, perinatal factors predominated in 18/59 cases (30.5%), in 17/59 (28.8%) postnatal factors, and only 6/59 (10.2%) prenatal factors. In 18/59 (30.5%) of the cases, these records were not found in medical records and/or the person responsible for the child did not have this information.

Among the perinatal causes, hypoxia/asphyxia occurred in 17/18 (94.4%) of the patients with CP and corresponded to the highest prevalence. Cases of malformations were detected in 3/6 (50%) and congenital infections in 2/6 (33.3%), corresponding to prenatal causes. Among the postnatal causes, there was also a high prevalence of encephalopathy hypoxic-ischemic after cardiorespiratory arrest (CA) corresponding to 10/17 (58.8%) of the cases, followed by meningoencephalitis in 3/17 (17.6%).

Table 3 Cause of Cerebral Palsy (Rehabilitation Center IV at Hospital Santo Antônio - Sep/2014 to Jul/2015)

Cause	N	%
Prenatal	6	10,2
Malformation	3	50
Congenital infection	2	33,3
Maternal Factors	1	16,7
Perinatal	18	30,5
Hypoxia / Perinatal Asphyxia	17	94,4
Prematurity	1	5,6
Postnatal	17	28,8
Hypoxic- encephalopathy	10	58,8
Ischemic secondary to CA		
Meningoencephalitis	3	17,6
Status Epilepticus	2	11,8
AVE	1	5,9
Jaundice	1	5,9
Not informed / Unknown	18	30,5

CRA, cardiac arrest; CVA, cerebral vascular accident

Clinical and functional aspects of cerebral palsy

Regarding the functional evolutionary aspect of the patients studied, more than one type of dysfunction per patient could be observed (Table 4). In the morphology aspect, craniofacial disproportion associated with microcephaly was found in 13/59 (22%) of the cases; the sensory and perceptual aspects found in medical records had specific reports for visual alterations and evidenced visual deficiency in 37/59 (62.7%) of the patients.

Language alteration with abnormality in verbal expression of speech was found in 26/59 patients (44.1%) and behavioral disorder requiring pharmacological therapy in 12/59 (20.3%). When assessing the motor functional patterns that contributed to the independence of patients were found: dysphagia in 17/59 (28.8%) and altered tonus, which could be observed in more than half of the patients, that is,

appendicular hypertonia in 31/59 (52.5%) and axial hypotonia in 21/59 (35.6%) were described in the physical examination of the sample.

Table 4 Clinical data of patients with CP (Rehabilitation Center IV at Hospital Santo Antônio - Sep/2014 to Jul/2015)

Clinical Data	N	
Complications		
Visual impairment	37	
Epilepsy	36	
Focal	11	
Focus with Generalization	7	
Secondary		
Generalized	2	
Other types	5	
Doesn't know how to inform / Absent	11	
Abnormal speech	26	
Dysphagia	17	
Microcrania	13	
Chronic constipation	10	
DRUG USE		
Anticonvulsants	35	
Neuroleptics	12	
TONUS AND REFLEXES		
Appendicular hypertonia	31	
Axial hypotonia	21	
Hyperreflexia in limbs lower	23	
Gait aspect	%	
Absence of independent walking	40	67,8
Walking with Orthosis	4	6,7
Independent March	3	5
No report on gait	12	20,3

Walking with Orthosis	**4**	**6,7**
Independent March	**3**	**5**
No report on gait	**12**	**20,3**

Specific functional alterations of the descending motor pathways that participate directly or indirectly in voluntary motricity (former pyramidal and extrapyramidal pathways) were described in terms of hyperreflexia of the lower limbs, corresponding to 26/59 (44%). In the functional analysis for gait, absence of gait was reported in 40/59 (67.8%); presence of gait in 7/59 (11.8%) and in 12/59 (20.3%) of the cases, there was no record of this functionality.

Assessing the existence of comorbidities, we observed a 36/59 (61%) case of epilepsy with various types of seizures. Focal seizures were the most prevalent type in the study, corresponding to 11/36 (30.5%) of cases, followed by focal seizures with secondary generalization in 7/36 (19.4%) of cases.

Discussion

The present study describes the sociodemographic and functional profile of 59 cases of cerebral palsy. It is known that the clinical problems and prognosis of individuals with CP depend on the brain lesion and its association with comorbidities that affect perception, communication, sensitivity, and the presence of other comorbidities, including epilepsy.

In the socio-demographic aspect of this study, a minimal gender discrepancy was noted in the study among the patients, demonstrating that the disease has no risk factor in this variable. This difference was also not found with statistical relevance in the prevalence of CP between females and males in other reports in the literature.[3] In addition to this aspect, it was observed that the highest prevalence of patients followed at the center was between 4 and 8 years of age. The study showed a smaller portion of patients older than 12 years, which can be related to the dropout rate from the multiprofessional follow-up during the child's rehabilitation. The age at the beginning of rehabilitation therapy has a great impact on the functional evolution of patients with CP, considering the need for family structuring and the reality of a child with special needs.[4]

The most common etiological factor found in the medical records were perinatal and postnatal. The study showed the high prevalence of perinatal hypoxia/asphyxia as an initiating factor of the disease, which corroborates what has already been demonstrated by other studies, which justify the fact by stating that cerebral depression is a form of protection in severe hypoxia.[5] According to the frequency of the presence of several factors in the prenatal period, it is not always possible to clearly say the predominant etiology. However, the predominant hemorrhages in the first trimester, gestational diabetes, maternal infections, especially those of the TORCH'S group (Toxoplasmosis, rubella, cytomegalovirus, Herpes Simplex) have repercussions on the neurological involvement of the child.

Events after the child's birth, i.e., those occurring in the postnatal period, may contribute to cerebral palsy. Postnatal events may cause intracranial hemorrhages, hypoxic-ischemic encephalopathy, hyperbilirubinemia encephalopathy and periventricular leukomalacia. [6]

Indicating a very high frequency for the spastic type of CP in this study population, we found previously described data from the literature that corroborate the predominance of this variety. This type of CP tends to course with increased global muscle tone, hyperreflexia, and motor deficits, corroborating the high presence of findings of hypertonia, hyperreflexia in the lower limbs, and difficulty in acquiring independent gait. However, it is also observed that this variety presents better functional evolution in rehabilitation when compared to the atethosic and ataxic ones, which are more complex in agreement with the observations of those who did not reach levels of motor independence. [7]

A portion of the patients in the study had visual impairment, which shows the need for ophthalmologic follow-up in their rehabilitation. These findings are directly influenced by ischemic hypoxic states where the reduced oxygen supply promotes tissue lesion of encephalic structures and may also result from sequelae of infectious inflammatory processes of the TORCH'S group causing chorioretinitis and cranial nerve paralysis. According to the literature, visual defects affect 50% of people with Cerebral Palsy. Strabismus, the inability to focus both eyes at the same time on the object, is a common problem in addition to retinopathy of prematurity. [8]

Epilepsy is present in more than half of them, also showing that a good part of them make frequent use of anticonvulsant medications to control the crises, which were predominantly of the focal type. The study showed that a significant portion of patients with CP present alterations that directly interfere in swallowing. This increases the risks of aspiration of the bolus, and the family should be attentive to the food most indicated for that child, and to the form and frequency of feeding it. In addition, authors use this factor as justification for worse nutrition and hydration of children with CP due to a decrease in the amount ingested because of dysphagia. [9]

Conclusion

i. In the population studied, the frequency of spastic CP was very high.

ii. The socio demographic study of the patients demonstrated that in PC the gender variable is not a risk factor.

iii. The study points out functional dependence in about 67.8% of patients with cerebral palsy.

iv. As discussed, the patients had variable age since their admission to the service, which can be considered late when considering preventive measures and orientation.

v. Early diagnosis is important to improve the functional prognosis, therapeutic efficacy and consequent improvement in the quality of life of these patients.

vi. The socio-demographic and functional study contributes to the scientific literature through the knowledge of the etiological factors of CP that can both promote changes in the prenatal sphere of future concepts and promote improvements in the follow-up of neonates in risk states.

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None.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Rodriguéz-Barrionuevo AC, Vives-Salas MA. Clínica de la Parálisis Cerebral Infantil. *Rev Neurol Clin.* 2001;2 (1):225–235,
2. Pascual JM, Koenigsberger MR. Cerebral palsy: prenatal risk factors. *Rev Neurol*. 2003;37(3):275–280.
3. Leite HP, Souza DR, Pato TR, et al. Cerebral palsy epidemiology. *Acta Fisiatrica*. 2002;9(2).
4. Dantas MS, Collet N, Moura F, et al. Impact of a cerebral palsy diagnosis on the family, Apr-Jun. *Florianópolis.* 2010;19(2): 229–237.
5. Rotta NT. Cerebral palsy, new therapeutic perspectives. *Jornal de Pediatria.* 2002; S48–S54.
6. Kok F. As Principais Afecções em Neurologia Infantil - Encefalopatias Não-Progressivas: deficiência mental e paralisia cerebral. In: Nitrini R, Bacheschi LA. A Neurologia que Todo Médico Deve Saber. 2 ed.
7. Koman LA, Smith BP, Shilt JS. Cerebral palsy. *Lancet*. 2004;363(15):1619–1631.
8. Moura TC. Functional independence in individuals with cerebral palsy. *Rev Pan-Amaz Saude*. 2012;3(1):25–32. 2012.
9. Graziela Pacheco VivoneMichelle Martins Mattos TavaresRenata de Salles Bartolomeu, et al. Analysis of alimentary consistency and deglutition time in children with spastic quadriplegic cerebral palsy. *Rev CEFAC.* 2007;9(4).