

Clinical Spectrum of Cerebral Palsy in South Jordan; Analysis of 122 Cases

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Abstract

Background: The clinical spectrum and associated factors of cerebral palsy may differ between developing and developed countries.

Aim: To evaluate the predisposing factors, clinical spectrum, and associated problems of cerebral palsy (CP) in children.

Setting and design: In this retrospective study patient data were extracted from file records in our center for early diagnosis of childhood disabilities.

Patients and methods: Our study population included one hundred and twenty two children with age range from 7 months to 17 years. Patients were followed and reviewed in a 32 months period from September 2007 to April 2010. Simple statistical analysis was used for percentage calculation.

Results and conclusions: Spastic type was the predominant (82.7%) ,with quadriplegic subtype being the most common (34.4%) the other types were choreoathetoid (8.2%) mixed type (6.6%) and ataxic (2.5%) being the least. Speech delay was the most common associated problem (71.3%) followed by mental retardation (61.5%), seizures (35.2%), hearing problems (26.2%), and autism (4.9%) being the least. The clinical spectrum of CP in our country may differ from that reported from the western countries. Prospective studies are needed to evaluate the clinical spectrum and predisposing factors in Jordan.

Keywords: Cerebral palsy; Clinical spectrum; South Jordan

Introduction

Cerebral palsy is one of the most common and costly chronic disorder, it affects up to 0.02% of all live births, and it occurs in all races. Cerebral palsy is defined as a group of non-progressive permanent disorders of movement and posture that occur following damage to the developing fetal or infant brain. It is often accompanied by other neuro developmental disorders [1]. Report about clinical spectrum, predisposing factors and complications are coming from developing countries. Although many doctors working in this field feel that there is difference in epidemiology between reports and what we see in our clinical practice.

The aim of this study is to evaluate some predisposing factors, clinical spectrum, and some associated problems of cerebral palsy (CP) in children. We will compare our figures with national and international studies [2,3].

Materials and Methods

This study included 122 children seen in an early diagnostic Centre located in Karak the major city in south Jordan. The center receives all types of child disabilities which are referred from different parts in southern Jordan. Each child is fully evaluated by a detailed history including pre and perinatal history, family history, and developmental milestones. Physical examination results are mentioned and recorded. Lab investigations are also recorded in our data registry. Patients were selected from the files system for CP patients seen and evaluated in this center in a 32 months period from September 2007 to April 2010. All cases were reviewed by the same pediatric neurologist and using the same file record.

Predisposing factors such as consanguinity, perinatal complications,

need for oxygen demand or resuscitation and NICU admission were all considered as one perinatal risk factor.

Neonatal jaundice was considered if patient history revealed the use of phototherapy or exchange transfusion. Mild jaundice not needing medical care was considered physiological and was excluded.

Regarding associations, epilepsy was considered when more than a seizure attack occurred or a patient was on antiepileptic treatment.

Detailed cognitive function evaluation was assessed by our psychologist for all patients when mental retardation was suspected clinically or was mentioned as a concern from parents. In some patients cognitive evaluation was specifically requested by educational authorities. Speech assessment was done by speech therapist.

Data were analyzed using simple statistical analysis for percentage calculation.

Results

Total number of patients was 122. Patients age ranged from seven month to 17 years with a mean age of 6 years and 4 months. (54.1%)

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of the studied patients were males with a male /female ratio 1.18 to1. Consanguinity of all degrees were found in 53.3% of cases.

History of perinatal problems mainly oxygen demand and NICU admission was found in 38.5% of the cases and considered the most common predisposing factor (As seen in Table 1).

85.2 % were term children and 14.8% were preterm. Neonatal jaundice was seen in 36 (29.5%).

42 (34.4%) of the children were first born, 24 (19.6%) were second, and 17 (13.9%) were third and 29 (23.7%)were fourth and another 8.4% were fifth to twelfth in birth order.

Clinical classification of CP was based upon the type and distribution of motor abnormalities. Although there is a substantial overlap among the clinical features, the distribution of spastic type was the most common (82.7%), choreoathetoid (8.2%), mixed (6.6%) followed by ataxic (2.5) being the least. (As seen in Table 2).

Regarding spastic type quadriplegic was the commonest (34.4%), hemiplegic type (26.2%), diplegic type (22.1%) being the least.

Head circumference was measured in all cases, 48 cases (39.3%) was below or far below the fifth centile for age.

Regarding associated problems (Table 3); Speech delay by history or by assessment was the most common (71.3%). Hearing impairment was seen in 32 cases (26.2%).

Mental retardation was tested with Stanford Binet intelligence scale and was present in 75 (61.5 %) of the children with CP.

The prevalence of epilepsy in all types of CP in our report was 35.5 %, and its distribution was with quadriplegic CP (40.4%) hemiplegics (31.25%) and in diplegic (25.9%)

Complications prevalence also differs according to CP type (Table 4). In quadriplegic type there is higher prevalence of all types of complications.

Predisposing Factor	(n)	(%)
consanguinity	65	53.3
perinatal	47	38.5
N.N jaundice	36	29.5
C/S	33	27
Prematurity	18	14.8

Table 1: Predisposing factors.

Type of CP	(n)	(%)
spastic	101	82.70%
quadriplegic	42	34.40%
hemiplegic	32	26.20%
diplegic	27	22.10%
choreoathetoid	10	8.20%
mixed	8	6.60%
ataxic	3	2.50%

Table 2: Distributions of types of cerebral palsy.

associated problems	n	(%)
speech delay	87	71.30%
mental retardation	75	61.50%
seizures	43	35.50%
hearing impairment	32	26.20%
Autistic behavior	6	4.90%

Table 3: Associated problems.

Cp type	seizures	M.R	Hearing	speech
quadriplegic	40.40%	73%	26.10%	76.20%
hemiplegic	31.25%	46.80%	25%	62.50%
diplegic	25.90%	37%	14.80%	55.50%

Table 4: Prevalence of complications according to CP type.

The most striking result is when a child is having mental retardation the chance to have other associations increase to 91.4% for speech, 48% for seizures and 36% for hearing.

Discussion

Cerebral palsy is a very common neurological disorder and frequently seen at neurology clinics [4]. The etiology of CP is not well understood, and brain lesions are thought to be associated with prenatal, perinatal, or postnatal events of varying causes. Risk factors for CP are multifactorial and can include preterm birth, multiple gestation, intrauterine growth restriction, male sex, low Apgar scores, intrauterine infections, maternal thyroid abnormalities, prenatal strokes, birth asphyxia, maternal methyl mercury exposure, and maternal iodine deficiency [5-7] Consanguinity of all its degrees was found in 53.3% of our children but this is similar to the normal prevalence [7,8] in our community which is 50 to 65% .Although this can give clue that consanguinity is not a predisposing factor for developing cerebral palsy .

The proportion of paternal parallel first cousins among first-cousin marriages showed a steady decline from one generation to the next [10].

The role of perinatal complications, particularly birth asphyxia, in the causation of CP has been questioned. Asphyxia has been suggested to be a consequence rather than a cause of the process that leads to CP. Seventy-eight percent of children with cerebral palsy did not have birth asphyxia [11]. However, our analysis showed history indicative of birth asphyxia in 38.5% of the studied cases. This result is similar to the findings mentioned in many studies done in developing countries [12]. This indicates that severe birth asphyxia, which is rarely seen in developed countries, continues to be a major problem in many developing countries. Most of the children in this report were born through normal vaginal delivery (73%). Instrumental delivery and caesarian section has been reported to be associated with CP [13].

Literature has showed that multiple pregnancies have been considered as an important prenatal risk factor for CP O'Reilly [13] 1981. 91.6% are first four in birth order and only 8, 4 % were between 5-12 in birth Order. This means that multiparty has no role as causative factor for cerebral palsy. Which correlate well with other results from other studies done in developing countries [14].

The contribution of prematurity to our studied CP population was not very clear as our analysis showed only 14.8% of the patients to be born prematurely. Many recent studies from industrialized countries show a rise in the childhood prevalence of cerebral palsy, largely because of the increasing contribution of children with low and very low birth weight. The only demographic determinant of cerebral palsy prevalence that is changing rapidly in the United States is survival of low birth weight and very low birth weight infants. Based on the magnitude of change in the survival of low and very low birth weight infants, it is estimated that childhood prevalence of cerebral palsy rose about 20% between 1960 and 1986 in the United States. These reports may explain the difference in type distribution of CP between developed countries and our countries. Figures from in which 27.8% of cases of CP are due to prematurity [12].

CP occurs in 0.2% of live births, but infants born before 28 weeks gestation have a 50-fold elevated risk when compared with infants born at term with prevalence between 6 and 26 % [15].

In this analysis neonatal jaundice was present in 29.6 % of cases. Its severity was not measured because it was a historical finding which makes the value of this finding very limited. In studies from developing countries the presence of neonatal jaundice as a predisposing factor is 14.4% [16].

There is no single test to diagnose cerebral palsy. Most of the information leading to the diagnosis of cerebral palsy is generally obtained from a thorough medical history and examination. Once the diagnostic evaluation is complete, further testing may be needed in order to define the specific needs of any individual child [17].

The prevalence of spastic CP cases was (82.7%) in our study, it is similar to that elsewhere [13]. The distribution of the clinical subtypes of the spastic cases were very different from the developed countries [12]. Spastic diplegic is generally the most common type of CP reported from developed countries. In our study spastic quadriplegia was the most common type, seen in (34.4%). This result is similar to what is reported by other developing countries studies [17] as well as some Jordanian results. In Al Ajlouni [3] study was (36%) and in AbdelKarim Al-Qudah [2] study it was even higher than these figures reaching up to (41%). This actually needs to be explained, and maybe the key for this explanation is to encourage prospective studies to precisely the predisposing factors which may differ in between different countries.

The next type in frequency was the hemiplegic (26.2%) while diplegic contributed to (22.1%). In one study from Boston analyzing 120 cases of CP, 52% percent [17] had quadriplegia, 31% had diparesis, and 17% had hemiparesis.

Other disabilities are very common to see in CP children. Almost all children with CP have at least one additional disability [18]. The most common was speech delay either as severe delay in acquisition of the skill or being a persistent problem in (71.3%). Still we should be careful while analysing speech delay as it may be a symptom of many disorders, including mental retardation, hearing loss, psychosocial deprivation which frequently complicate cerebral palsy.

61.5% of our children with CP has mental retardation. Children with spastic quadriplegia had the worst intellectual outcome.

Epilepsy was reported to be seen frequently in CP children. In about one third of cases, it is often severe and difficult to control particularly in children with mental retardation [19]. The presence of cerebral palsy

requires differential consideration of the severity of epilepsies. Epilepsy occurred in (35.2%) of our CP children. Epilepsy was significantly more common in children with CP and mental retardation. It was very striking that the presence of mental retardation correlates with the severity of the condition.

Other studies from the Middle East area revealed the well-established high frequency of associated neurological deficits with CP [20].

Regarding autistic behavior we did not apply any formal test, the diagnosis was done clinically, and the autistic behavior was also observed by our psychologist during testing the cognitive function of these children. In the literature, almost nothing is mentioned regarding motor disabilities and autistic disorder [21]. In our study all autistic behavior cases were seen in mentally retarded children so maybe the link of autism is more with the mental retardation than with CP provided that the last is motor disorder.

Conclusion

Our analysis demonstrated a spectrum of CP in Jordan that differs from what is seen in western countries. Many things contribute to CP but our study showed that perinatal factors are still an important predisposing factor for CP.

This is a retrospective study, with a small number of patients. It gives a good idea about the CP population in south Jordan and the risk factors and complications of the condition. It is another more data to add to the literature from the Middle East. Still more prospective studies are needed to evaluate well these predisposing factors and to validate those results.

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