

Physical Therapy Registry for Establishment of Cerebral Palsy in Alexandria City (Almontazah District), Egypt

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Abstract:Background: Patient registry is a file of documents containing uniform information about individual persons, collected in a systematic and comprehensive way, in order to serve a pre-determined scientific, clinical or policy purpose.

Aim;this study was conducted to establish data base for cerebral palsy (CP) in Al montazah district Alexandria city. **Subjects and Methods:** children with CP who are receiving physical therapy services of both genders, ranged in age from 6 months to 15 years in central hospitals, Health insurance hospitals and all private physical therapy centers which deal with children in Al montazah district. The number of cases which included in this study was 180 cases. The outcomes measures were Viking speech Scale, Manual Ability Classification System (MACS), Gross Motor Function Classification System (GMFCS) and Gross Motor Function Measure (GMFM).

Results:One hundred and eighty cases were enrolled with a prevalence of 1.5 per 1000 live births. The participants in the study, 67.22% were spastic type, 8.9% were dyskinetic, 8.33% were ataxic and 15% were hypotonic. Percentage of CP based on GMFCS were; Level I- 11 (6.1%), level II-40 (22.2%), level III-63 (35%), level IV-55 (30.5%), and level V-10 (5.5 %). GMFM was used to determine the score of performance for each participant. According to MACS and Viking speech scale high incidences of children with CP were classified at level II.

Conclusion:the current study revealed that CP children who are receiving physical therapy; incidence of spastic type was the major while dyskinetic and ataxic types were nearly the least prevalence. High incidences of children with CP were classified level III.

Keywords: Almontazah, Cerebral palsy, Registry, physical therapy

I. Introduction

Cerebral palsy (CP) is a term that has been formally defined as a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication and behavior, by epilepsy and by secondary musculoskeletal problems.1Prevalence estimates range from 1.5-3/1,000 in western countries, with much higher and wider range, 2-10/1,000 live births, in the developing areas2 Durkin et al 2016

In an Egyptian study by El-Tallawy et al., 20143 It was 2.04 per 1000 live births. The variation in prevalence and clinical picture depends mainly on study design, populations, and diagnostic criteria. The epidemiology, clinical picture, and associated comorbidities in CP have been extensively studied in high-resource countries but in low-resource areas, including Africa, those studies are still lacking. CP has many risk factors. The most common are low birth weight and perinatal hypoxia accounting for almost 50% and 10-20%, respectively.4This study aims at identifying the prevalence and the disability profile and associated comorbidities of CP cases in a prospective cross-sectional study from referral centers of physiotherapy and rehabilitation in Al montazah district, Alexandria city, Egypt.

II. Subjects and methods

All documented CP cases, from Almontazah district have been included in this study which was conducted from 1st of June up to 30 December.

Inclusion criteria:

The age ranged from 6 months to 15 years, with disease onset within the first year of life. Cases were recruited from every physiotherapy and rehabilitation center.

Exclusion criteria

Cases with developmental regression, malignancy, and peripheral central nervous system affection were excluded.

For evaluation:

- 1.1 The Gross Motor Function Classification System: Is a classification system developed for children with CP. Initially, children with CP were divided into five levels by considering their independency in gross motor functions such as sitting, walking, mobilization and transfer activities and the tools-equipment. As motor functions of children differ according to age, functions have been defined as below 2-year old, between 2 and 4 year old, between 4 and 6 year old, between 6 and 12 year old, and above 12 year old for each level.
- 1.2 Associated comorbidities including cognitive impairment, epilepsy, visual impairment, and hearing impairment were ascertained both by history taking and examination. For hearing impairment, an official audiometry result was reviewed.

A formal written consent has been taken from parents or care givers for all cases. The study was approved by the local ethical committee. Data was analyzed using IBM SPSS Statistics 22.

III. Results

The number of CP cases in this population who receive physical therapy services was 180. The distribution of types of CP within the study group were 121 (67.22%) spastic, 16 (8.9%) dyskinetic, 15 (8.33%) ataxic and 27 (15%) hypotonic as shown in table (2). The distribution of spasticity was as follows: 40 (22%) quadriplegia, 59 (33%) diplegia, 22 (12%) hemiplegia. Level of impairment according to Gross motor functional classification system (birth-18 y) table (3) as follows: Level I- 11(6.1%), level II-40 (22.2%), level III-63 (35%), level IV-55 (30.5%), and level V-10 (5.5 %). Number and percentage of associated impairments with CP cases as follows table (4), out of 180 children included in this study 133 (73.8%) had Speech impairment, 117 (65%) had Cognition impairment, 84 (47%) had epilepsy or multiple seizure. 40 (22%) had congenital anomaly, 38 (21%) had strabismus, 37 (20.5%) had vision impairment and 6 (3.3%) had hearing impairment. There is relation between GMFCS and cognitive impairment as shown in table (5). It was founded that each grade higher on GMFCS was associated with increased risk for occurrence of cognitive impairment also the correlation between type of CP and Epilepsy as shown in table (6). It was founded that Quadriplegic type is the most affected by epilepsy.

IV. Discussion

This study was conducted to establish a data base about children with CP receiving physical therapy services in general, health insurance hospitals and all private centers in Almontazah district, Alexandria governorate. All children were diagnosed as CP included in this study. The collected data in this study revealed that CP could affect both genders; however boys were affected than girls similar to SkiÖld et al., (2014)⁵ who reported that the risk of CP is significantly greater in males than in females. The current study revealed that a boy/ girl ratio of 1.4/1, almost similar to 1.3 reported by Johnson, 2002⁶ in Europe. According to our sample, there were no cases above 15 year old receiving physiotherapy service. This finding could be related to the extreme sides of the disability spectrum, being either mild and almost completely rehabilitated, or severe and neglected at home due to logistic issues (difficult transportation of grown up patients, negative attitude towards severe cases in low socio economic population, or financial issues). The total number of CP cases was 180 cases, representing 1.5 per 1000 live birth. Prevalence of CP occurs at a rate of 2-2.5 per 1000 live births in developed countries.⁶ Also in Egypt; El-Tallawy⁷ reported a prevalence of 2.03 and 3.6 per 1000 live birth in Al-Kharga District and Al-Quseir city³, respectively. The lower prevalence can be attributed to multiple factors. First of all, the different methodology as our study includes only those cases under the age of 18 year receiving physiotherapy services. Also, our cases are those with a disability severe enough to push the care givers to seek medical services. Second the prevalence of CP has a dynamic properties related to attitude and quality of health care and neonatal mortality.⁴ According to our study premature delivery and LBW accounted for 33% and 20.55%, respectively. These figures are low in comparison to international figures (78%) reported in developed countries. This difference is expected in terms of high mortality rate of premature and LBW and higher incidence of perinatal hypoxic events.⁸

Our results on the types of CP are similar to those reported in developing countries as reported by Kakooza-Mwesige et al. 2015⁹. Spastic CP is the most common type, worldwide. Similarly, most of our patients (67%) were spastic. Dyskinetic CP (9%) is higher than the figures in western countries (6%).¹⁰

The higher ratio in our area can be explained by the lack of awareness of families to the impact of neonatal hyperbilirubinemia and the reluctance to seek medical advice. The ataxic cases constituted almost 9% of total number which is in consistency with local and international figures.^{3, 7, 9}

Spastic quadriplegic CP is the most severe form affecting 40 patients (22%) of all CP cases.

Epilepsy and cognition abnormality were found in 47% and 65%, respectively. These figures are similar to those reported in Africa 3, 9 but higher than reported in developed areas¹⁰. The difference can be explained by the greater proportion of cases with extensive bilateral brain injury in diplegic and quadriplegic cases which are more vulnerable to develop symptomatic epilepsy. It is worth mentioning that epilepsy was related to the level of GMFCS. This finding was addressed also by Hundozi-Hysenaj and Boshnjaku-Dallku, (2008)¹¹. Regarding cognitive profile, GMFCS level was a detrimental factor which is consistent with Dalvand et al., (2012)¹², who stated that GMFCS could be considered as a gross proxy for evaluating the cognitive deficit.

Regarding GMFCS, 6.1% of cases were at level I, 30.5% at level IV, and 5.5% at level V. In the study conducted by Kakooza-Mwesige et al. 2015 ⁹, the percentage of cases at level I is very similar with little higher percentage at level IV and V. on the other hand, in a Swedish study, 32% of cases were at level I, 15% at level IV, and 16% at level V.¹³ The difference is mainly lies with level I which is the mildest form. This reflects the effect of public awareness, the different etiologies, level of neonatal care, the importance of early detection, and the quality of rehabilitation programs.

V. Conclusion

In conclusion, our study revealed a prevalence of 1.5 per 1000 live births from the age of 6 months to 18 years. Two thirds of our study are ambulant, an evidence for the paramount importance of early detection and intervention. The most common subtype is spastic CP, while the most common comorbidity is speech impairment followed by cognition. GMFCS is a useful tool for assessment and it may offer a good predictor for epilepsy and cognitive impairment. In comparison to international figures, it seems that the perinatal and high quality neonatal care is still lacking in developing countries. Also, being of a low-resource population, the accessibility to physical therapy and rehabilitation programs is to be revisited.

Limitation

This study has some important limitations. As this study was based on participation of children's parents to collect information, some parents refused to give information about their children and also their children's birth report and Some Medical reports have been lost from parents. Also, There are private centers didn't allow to register the cerebral palsy cases from it. Furthermore, some scales used age not included in all the sample of the study.

Disclosure

The authors report no conflicts of interest in this work.

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Table-1 Demographics of cases (Number=180)

Variables		Frequency	percent
sex	Girls	75	42%
	Boys	105	58%
	Total	180	100%
Parent consanguinity:	Positive	64	42%
	Negative	116	58%
	Total	180	100%
Gestational age:	Preterm	60	33%
	Full term	120	67%
	Total	180	100%
Birth weight (BW):	Normal BW (> 2500 gms)	114	63.33
	LOW BW (2499-1500 gms)	37	20.55
	Very low BW (< 1500 gms)	22	12.22
	Extremely low BW (< 1000 gms)	6	3.33
	Incredibly low BW (< 750 gms)	1	0.55
	Total	180	100%
Type of delivery	Normal	69	38%
	C.S	111	62%
	Total	180	100%

Chronological Age	6 m-2 y	40	22.2%
	2 -4 y	52	28.8%
	4-6 y	36	20%
	6-12 y	48	26.6%
	12-15 y	4	2.2%

LBW = low birth weight

Table-2 Types of CP

Types of CP	Frequency	percent
Spastic	121	67.22%
Dyskinetic	16	8.9%
Ataxic	15	8.33%
Hypotonia	27	15%
Total	180	100%

Table- 3 Motor impairment according to GMFCS

Level /Year	I	II	III	IV	V	Total
6m-2y	1	8	11	16	4	40
2y-4 y	3	9	20	19	1	52
4 y-6 y	2	10	15	7	2	36
6 y- 12 y	4	10	18	13	3	48
12 y-15 y	1	3	0	0	0	4
Total	11	40	63	55	10	180

Table-4 Associated Impairments

variables		Frequency	percent
Speech impairment	Yes	133	73.8%
	No	47	26.1%
	Total	180	100%
Cognition impairment	Yes	117	65%
	No	63	35%
	Total	180	100%
Epilepsy or multiple seizure	Yes	84	47%
	No	94	52%
	unknown	2	1%
	Total	180	100%
Congenital anomaly?	yes	40	22%
	No	140	78%
	Total	180	100%
Strabismus	Yes	38	21%
	No	140	78%
	Unknown	2	1%
	Total	180	100%
Vision impairment	Yes	33	37%
	No	143	79.4%
	Total	180	100%
Hearing impairment	Yes	6	3.3%
	No	174	96.6%
	Total	180	100%

Table-5 Distribution of cases with cognitive impairment according to GMFCS score

GMFCS		Cognition		Total	P value
		normal	affected		
GMFCS	I	9	2	11	<0.001
	II	11	29	40	
	III	28	36	64	
	IV	12	43	55	
	V	3	7	10	
Total		63	117	180	

Table-6 Correlation between type of CP and Epilepsy

		Epilepsy		Total	P value
		affected	normal		
Type of spastic CP	Spastic	55	67	122	P < 0.001
Dyskinetic		10	6	16	
ataxic		6	9	15	
hypotonic		13	14	27	
total		84	96	180	

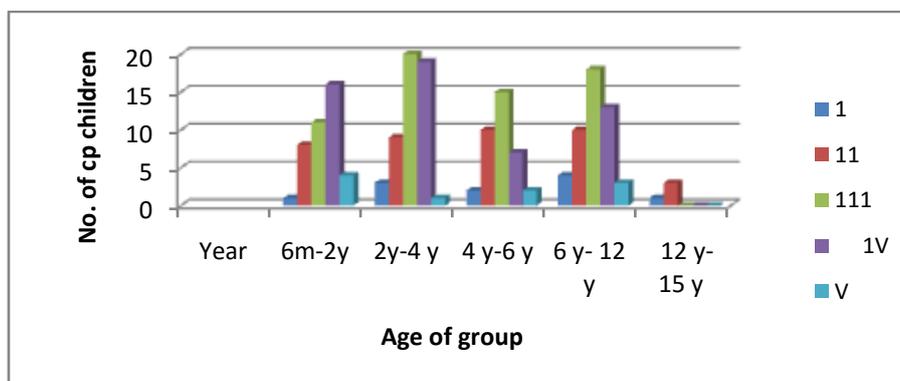


Figure-1: Level of impairment according to Gross Motor Functional Classification system (6months-15year).

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