Prevalence of Cerebral Palsy in Damanhur at Elbuhera Governorate

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Abstract:

Back ground: Cerebral palsy (CP) is one of the most common causes of physical disabilities. The prevalence of CP in developing countries isn't clearly documented.
Purpose : To determine the prevalence of cerebral palsy in Damanhur at Elbuhera Governorate. **Subjects and Methods**: One hundred sixty one children with CP receiving physical therapy services of both genders participated in this study. Their ages ranged from one month up to 14 years. They were recruited from two public hospitals and six private centers in Damanhur. They were subjected to modified Australian Registry Form. **Results:** within study population the results revealed that the prevalence of CP children who received physical therapy services were 0.8/ 1000 live birth in Damanhur. Boys and girls represented 39.1% and 60.9% respectively from total cases. The percentage of CP types was spastic 88.2%, hypotonic 5%, dyskintic 4.9% and ataxic 1.9%.The results of Gross Motor Function Classification System (GMFCS) and Manual Ability Classification System (MACS) revealed that level IV and level V respectively had the highest percentages**. Conclusion:** Spastic type is the highest percentage while ataxic type is the least percentage of total cases **.** Based on GMFCS and MACS, most of patients were severe cases.

Keywords: Cerebral Palsy, Damanhur, prevalence, GMFCS, MACS.

Introduction

Cerebral palsy (CP) encompasses a heterogeneous group of early-onset, non-progressive, neuromotor disorders that affect the developing fetal or infant brain.[1]

Cerebral palsy is classified by the type of movement problems (spastic , diskinetic, ataxia, dystonia) or by the body parts affected (hemiplegia, diplegia, and quadriplgia**)** [2].

Incidence rates are the numbers of new cases of a disease within a specified period of time. They often refer to a birth cohort or longitudinal study and are therefore more difficult to study in resource-poor settings where follow-up and health access were difficult[3]

Prevalence rates are described as the proportion of a given population experiencing the condition at place . It is a useful tool for planning service. [4]Cerebral Palsy prevalence and determination of whether changes in risk factors affect the prevalence of CP over time require systematic population-based surveillance. Population-based monitoring of CP prevalence helps to determine service needs for affected children and their families. Descriptions of the frequency of CP subtypes in the population may be basic for regarding etiology. The studies of CP prevalence can help clinicians and other service providers to develop more coordinated and holistic care. [5] It is useful to clinicians by enabling them to identify subgroups of children requiring specific etiologic investigations, and also to provide more accurate information to the parents of children with CP.[6]

The CP research is of low priority in developing countries where infectious diseases such as human immunodeficiency virus(HIV), malaria and tuberculosis are common [7].

Australian registry form uses validated measurement tools to record spasticity and functional severity of cerebral palsy by Gross Motor Function Classification System(GMFCS) and Manual Ability Classification System(MACS). [8]It includes clinical details,(child details-parent details), GMFCS and MACS. Gross Motor Function Classification System is a reliable and valid method for classifying functions among children with CP and is widely used in clinical settings. it is based on self-initiated movement, with emphasis on sitting, transfers, and mobility [9]. While MACS from 4 years till 18 years, focus on the child's ability to handle objects in important daily activities, during play , leisure, eating and dressing.[10]

The aim of study was to establish data base about the prevalence of children having CP in Damanhur at El buhera.

Approval letter from Faculty of physical therapy was obtained to begin the study **and** written informed consent from each subject's parent to be participated in this study.

Subjects

One hundred sixty one children with CP of both genders participated in this study. Their ages ranged from one month up to14 years. All children with CP were recruited from two public hospitals and six private centers in Damanhur.

Methods

All CP children were subjected to modified Australian Registry Form **.** It included clinical details of person, GMFCS and MACS. Clinical details involved child details and parent details.The GMFCS has five-levels. Level I **:**Walks without restrictions, limitations in more advanced gross motor skills .Level II: shows that Walks without assistive devices, limitations in walking outdoors and in the community**.** Level III**:** Walks with assistive mobility devices, limitations in walking outdoors and in the community**.** Level IV: is Self-mobility with limitations, children are transported or use power mobility outdoors and in the community. Level V: is Self-mobility is severely limited even with the use of assistive technology .Also MACS has five levels; Level I: is handles objects easily and successfully. Level II: is handles most objects but with somewhat reduced quality and/or speed of achievement. Level III: is handles objects with difficulty; needs help to prepare and/or modify activities. Level IV: is handles a limited selection of easily managed objects in adapted situations .Level V: is does not handle objects and has severely limited ability to perform even simple actions.

The evaluation procedure**s** were done for one and half to two hours for each child. The data for this study was collected from patient's file, parents, medical stuff and physical therapy evaluation. This study was conducted from January 2016 up to June 2016.

Statistical analysis

Data were analyzed using SPSS computer package version 11.5. Data were presented as mean ± SD for normally distributed. For qualitative data, chi-squared (χ^2) was used for comparisons between groups. For all tests $P < 0.05$ was considered to be statistically significant.

Results:

The total population in Damanhur city was 947514 person in 2016 census . Total number of pediatric under age of 14 years old was 307456 of total population, (target population for this study).The results of current study revealed that the prevalence of CP was 0.8 per 1000 birth live in Damanhur**.** Within the study population, boys and girls were represented 39.1% and 60.9% respectively of all cases. The percentages of Rural resident was 41.6% and urban resident children was 58.4% from total cases. The gestational age for participated CP children in the study showed that ,the percentage of full term was 67.7%, ,pre-term was 22.4% ,and un known fetus term was 9.9 % from all cases . According to type of delivery, 34.2% from all cases with normal spontaneous delivery and 65.8% by caesarian section delivery .Regarding to the results of the types of CP, they were 88.2% spastic types. The percentages were 21.2% hemiplegia,32.3% diaplegia ,1.2% tetraplegia and 33.5% quadriplegia. The percentages of dyskinetic type was 4.9% (athetosis 4.3%,dystonia 0.6%), percentage of ataxia was 1.9% and percentage of hypotonia was 5% from all cases as shown in table 1.

Levels of cerebral palsy severity based on GMFCS represented in table 2 while levels of cerebral palsy hand abilities from 4 to 18 years based on MACS demonstrated in table 3.

Table (1): Types of cerebral palsy.

Variable	Freq.	%	Rank
Left hemiplgia	22	13.7	3
Right hemiplgia	12	7.5	4
Diplegia	52	32.3	2
Tetraplegia	2	1.2	8
Quadriplegia	54	33.5	1
Athetosis	7	4.3	6
Dystonia	1	0.6	9
Ataxia	3	1.9	7
Hypotonia	8	5	5
Total	**161**	**100**	**-**

Table (2) Levels of cerebral palsy severity based on Gross Motor Function Classification System .

Variable	Freq.	%	Rank
GMFCS Level I	6	3.7	5

GMFCS Level II	30	18.6	4
GMFCS Level III	36	22.4	3
GMFCS Level IV	50	31.1	1
GMFCS Level V	39	24.2	2
Total	**161**	**100**	**-**

(Table 3):Levels of cerebral palsy abilities based on Manual Ability Classification Scale.

Variable	**Freq.**	**%**	**Rank**
MACS level I	1	1.5	5
MACS level II	16	24.6	3
MACS level III	19	29.2	2
MACS level IV	9	13.8	4
MACS level V	20	30.8	1
Total	**65**	**100**	**-**

Discussion

El-Behera Governorate enjoys an important strategical place. it consists of 16 centers and 14 cities. According to **El-Behera information center**, It's total area is 9826.00 Km^2. Damanhur is the capital of Behera governorate. [11]

There is no documented, or accurate data regarding the prevalence of cerebral palsy children in Damanhur , according to the Directorate of health so, this study may help public health official to determine actual size of the biggest problem facing the children.

The total population in Damanhur city was 947514 person in 2016 census . Total number of pediatric under age of 14 years old was 307456 of total population, (target populations for this study) [12].

These results of current study revealed that the prevalence of CP was 0.8 per 1000 birth live which is convenient with the prevalence of CP in **Saudi Arabia** (0.7/1000)

[13].Also the results of this study supported by the study of **Yasin and Abd-elazeem.,(2016)** who reported the incidence of cp was at Bani-Mazar district, Alminya governorate (1:1000 live birth). [14] while in other studies for **El-Tallawy et al.,(2011,2014)** [15, 16] who reported that the prevalence of CP was 2.03 and 3.6 per 1000 live birth in Al-Kharga district and Al-Queir city respectively. The prevalence rate of cerebral palsy in Damanhur may be due to some rural parents refused to treat their children with disabilities due to lower care givers education and cultural level, lack of physical therapy services and economical status.

The recorded results revealed that CP occurs in both genders; with higher prevalence in girls than boys. Boys were represented 39.1% and girls were represented 60.9% of all cases. It may be returned to the higher importance of healthy periodic follow-up in pregnancy of male sex fetus. These results were convenient with the findings of **El-Tallawy et al.,(2011)** [16] who stated that the prevalence rate of CP was higher among girls than boys in El-Kharga District- new Valley (Egypt).They explained their results due to neglection of periodic caring for mothers with girls sex of fetus. These findings weren't convenient to **Yasin and Abd-elaazem (2016)** [14] who reported that the ratio was higher among boys than girls in Bani_Mazar,Minya.

The results of the current study revealed that the urban cases were higher than rural cases. This may be related to poor of physical therapy services in rural area , the physical therapy services were concentrated in urban area. These results disagree with the findings of the study of **yasin and Abd-alazim ,(2016)** [14] who stated that the percentage of CP cases in rural area was higher than urban area in Bani_Mazar, Minya.

Regarding the results of gestational age categories in this study: full term percentage was 67.7%, pre-term percentage was 22.4% ,and un known term percentages was 9.9 % of all cases . These results supported by the study of **WU ,(2003)** [17] who stated that CP occurs commonly in children who are born in premature or at term.

According to the findings of the current study, normal spontaneous labor recorded 34.2% while caesarian section recorded 65.8%. **MacLennan (2004)** [18]**,** stated that Emergency cesarean delivery was associated with increased risk of CP and **Daher and El-Khairy, (2014)** [19]added that CP children who delivered by emergency caesarean

section were due to long labor, premature rupture of membranes, multiple births , fetal distress., loss of amniotic fluid, no contractions and the health of the mother.

The results of the current study revealed that the percentages of varies types of CP were 88.2% spastic , 4.9% dyskinesia, 1.9% ataxia and 5% hypotonia from all cases . These results confirmed with the findings of **Blair and Watson , (2006)** [20] who reported that spasticity is predominant in CP children occurring from 77% to 92%,diskinesia percentage from 0.02% to 0.15% and ataxia percentage from 2% to 8%.

The results of GMFCS were 24.2% level V, 31.1% level IV, 22.4% level III , 18.6% level II and 3.7% level I. level IV was the highest percentage, this means that the severity of these cases were high. These results were consistent with **Pfeifer et al., (2009)** [21] who reported that most of spastic children were level IV and V according to GMFCS.

In this study MACS have five levels; level V has the highest score followed by level III and then level II and These were disagree with the findings of **van Eck et al.,(2010)** who reported that level I has the highest followed by level III then level V. [22]

Most studies of the prevalence of CP reported that the prevalence in low-income countries is more greater than the prevalence in industrialized countries. That due to major risk factors in some low-income countries include specific genetic diseases, a higher frequency of births to older mothers, consanguinity, and specific micronutrient deficiencies and infections. [23] Epidemiologic studies are needed to raise awareness of the public health impacts of developmental disabilities in low-income countries and to provide a basis for setting priorities and designing efficient intervene[24].

Conclusion

The current study revealed that the highest percentage of CP children was spastic type while the least percentage was ataxic type**.** According to GMFCS and MACS, the majority of cerebral palsied patients were severe
cases.

This study is not only counting cases but also using modified Australian registry form as a way of assessment for severity and abilities of cases by GMFCS and MACS. It may help to improve health services, awareness about cerebral palsy and establish data

base about CP cases in Damanhur. This study is limited to Damanhur city ,so many studies may be needed to cover whole areas in El buhera Governorate.

References

1) Rosenbaum P., Paneth N., Leviton A., et al. (2004): diagnostic assessment of the child with cerebral palsy: report of the Quality Standards Subcommittee of the American Academy of Neurology and the Practice Committee of the Child ; (62):851–863.

2) Bax M., Goldstein M., Rosenbaum P., et al.(2005): Proposed definition and classification of cerebral palsy. Developmental Medicine and Child Neurology ; (47): 571-576.

3) Cans C., Surman G., McManus V., et al.,(2004): Cerebral palsy registries. Semin Pediatr Neurol; (11): 18–23.

4) Oskoui M., Coutinho F., Dykeman J.,ETAL. (2013): An update on the prevalence of cerebral palsy: a systematic review and meta-analysis. Developmental Medicine & Child Neurology, (55): 509–519.

5) Surveillance of Cerebral Palsy in Europe (SCPE),(2000): Surveillance of cerebral palsy in Europe: a collaboration of cerebral palsy surveys and registers. Dev Med Child Neurol; (42):816–824.

6) Bax M., Goldstein M., Rosenbaum P., et al.(2005): Proposed definition and classification of cerebral palsy. Developmental Medicine and Child Neurology ; (47): 571-576.

7) Australian Cerebral Palsy Register (2013). Report of the Australian Cerebral Palsy Register, Birth Years 1993–2006. Sydney: Cerebral Palsy Alliance Research Institute.

8) Smithers H., McIntyre S., Gibson C., et al.(2016): The Australian Cerebral Palsy Register Group. Findings from the Australian Cerebral Palsy Register, birth years 1993 to 2006.Developmental Medicine & Child Neurology, (58) 5–10.

9)Lee J., Shim K., Kim J., et al (2015). Gross Motor Function Outcome after Intensive Rehabilitation in Children with Bilateral Spastic Cerebral Palsy; (4):624-629.

10) Eliasson L., Krumlinde S.,Rösblad B., et al (2006). The Manual Ability Classification System (MACS) for children with cerebral palsy: scale development and evidence of validity and reliability; (7):549-54

11) Ministry of Investment Egypt. Retrieved: (2016).

12) Damanhure Health Department,file(2016)

13)Mohammed M. (2006): Cerebral Palsy: Comprehensive Review and Update. Ann Saudi Med;(2):123-132.

14)Yasin Q.,and Abdalazim F. (2016): Registry of cerebral palsy in Bani _Mazar, Elminya. master thesis of Faculty of physical therapy, Cairo university.

15) El-Tallawy H., Farghaly W., Shehatta G., et al.(2011): Epidemiology of cerebral palsy in El-Kharga District- new Valley (Egypt); (5):406–411.

16) El-Tallawy H., Farghaly W., Shehata G., et al.(2014): Cerebral palsy in Al-Quseir City, Egypt: prevalence, subtypes, and risk factors. Neuropsychiatr Dis Treat. (10):67-72.

17) WU Y., GJ E., JK G., et al, (2003): Objective To determine whether clinical chorioamnionitis increases the risk of CP in term and near-term infants. Design, Setting, and Patients Case-control study nested within a cohort of 231 582 singleton infants born at 36 or more weeks' gestation(1):402_423.

18) MacLennan A., O'Callaghan M.,(2013): Cesarean delivery and cerebral palsy: a systematic review and meta-analysis.Obstet Gynecol. (6),1169 :1097.

19) Daher S., El-Khairy L.,(2014): Epedemiology of cerebral palsy.semin fetalNeonatalMed;11(2):117_125

20) plair F., and Watson L., (2006) :The important role played by pre partum risk factors is supported by the observation that a high proportion of children with CP , Arch Dis Child Fetal Neonatal Ed ;(17) 4-7.

21) Pfeifer L., Silva D., Funayama C., et al. (2009): Classification of Cerebral Palsy. Association between gender, age, motor type, topography and Gross Motor Function; (4):1057-1061.

(22) Van M., Dallmeijer A., Lith L., et al. (2010): Manual ability and its relationship with daily activities in adolescents with cerebral palsy;(42): 493–498.

(23)Maulik K., Darmstadt L.,(2007): Childhood disability in low- and middle-income countries: overview of screening, prevention, services, legislation, and epidemiology; (120):51–55.

24) United Nations Children's Fund.(2006). Early Child Development Unit. Programming Experiences in Early Child Development. New York: UNICEF . http://www.unicef.org/earlychildhood.