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Frequency of Problems in Activities of Daily Livings in Children with Cerebral Palsy

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Author`s Contribution

[1-2]Conception and design, Collection and assembly of data, [3]Drafting of article, Analysis and interpretation of the data, [4-6]Critical revision of the article for important intellectual content, [4]Statistical expertise [3]Final approval and guarantor of the article.

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A B S T R A C T

Background: Children with Cerebral Palsypatient have difficulties in performing their ADL' s. Many factors effects on ADL' s independence including impairment of upper limb function and fine motor skills. Effect of disability changes over time and severity ranges from mild to severe so there was the need of such study that might help occupational therapist in planning those activities which will make the patient independent in ADL' s

Objective: To find the frequency of problems in daily livings activities in children with cerebral palsy.

Methodology: It is a Cross-sectional Study conducted in the Department of Developmental & Behavioral pediatrics, The Children's Hospital and The Institute of Child Health, Lahore, Rising Sun Institute for special children and Hospital of Pakistan Society for Rehabilitation of the disabled (PSRD), Lahore. The study sample was 50 diagnosed Children with Cerebral Palsy (CP) with Activities of daily Livings (ADL's) problems sampling technique was used for sampling. The Cerebral Palsy (CP) patients were interviewed using Barthel Index Activities of daily livings (ADL's) scale.

Results: This research showed in bowels 52% patient were incontinent whereas in bladder 50% patient incontinent. Grooming skill showed that ability of patient to wear dresses was absent in 50% patient, 34% patient help and 16% patient were independent. Ability of patient to sit on toilet seat was absent in 50% patient, 26% patient need help and 24% patient were independent. Feeding problems showed that 46% Cerebral Palsy (CP) patient have feeding problems, 34% patient needs help in cutting and 20% were independent. In mobility 42% patient were unable to move and 12% patient required major, 20% patient required minor help and 26% patient were independent.

Conclusion: The conclusion of the study is cerebral palsy patients have problems in Activities of daily livings (ADL's). Severe cerebral palsy type has more problems as compared to mild cerebral palsy. Effects of disability often changes over time and severity ranges from mild to severe. These problems mostly due to motor and sensory impairments.

Keywords: Activities of daily livings, Cerebral palsy, Gross motor function, Selective dorsal rhizotomy

Introduction

Cerebral palsy is non- progressive disorder that affects movements, muscle tone and co-ordination due to brain injury. Effects of disability often change over time and severity ranges from mild to severe. (1).There are 3 basic types of cerebral palsy; Spastic cerebral palsy is due to the upper motor neuron lesion. It is characterized by hyper-tonicity. It accounts 80% of all types. Spastic cerebral palsy has 4 types; Spastic hemiplegic, Spastic diplegic, Spastic quadriplegic, Spastic

paraplegic.(2).The overall prevalence is 2.5 per 1000 but may vary from 1 to 6 per 1000. About 2 to 3 out of every 1,000 children have CP, making it the most common neuro-developmental motor disability in children. Each year in the United States, approximately 1 in 278 infants is diagnosed with CP.(3).

Cerebral Palsy has multifactorial etiology; Pre-Natal, Natal, Post-Natal. There are large no of risk factors. The strongest risk factor include pre-maturity and low birth weight, intra-uterine exposure to infection and disorder of coagulation. The cause remains unknown in 20-30% of cases.(4) Symptoms are usually occurring at the age of 2 years. Delayed in developmental stages are such as crawling, rolling, sitting and walking. Most common symptoms of cerebral palsy include; Hyper-tonicity or spasticity, Reflex abnormalities and scissoring posture, Atypical motor performance(Asymmetrical hand movement and unusual gait), Difficulty in feeding and sucking, speaking and understanding words, Hip dislocation and hip subluxation, Equino-varus and valgus deformities of feet.(5) For diagnosis of cerebral palsy patients complete neurological examination is important. The following tests can helpful in diagnosis of C.P; MRI , CT scan , Electroencephalogram if there are seizure, Blood tests.(4) There is no proper treatment of cerebral palsy. The main treatment purpose is to make the patient as independent as possible. Multi-disciplinary approach requires for treatment, including; Developmental pediatrician, Occupational therapist , Physical therapist, Orthopedics, Speech therapist, Social workers, Nurses, Neurologist .(6)

Activities of daily livings refer to the things we normally do such as dressing, grooming, feeding, bathing, homemaking and leisure. ADLs are those occupational performance task that person does every day to prepare for role task. (7). There are two types of ADL's. 1. Basic ADL's 2. Instrumental ADL's. Basic ADLs (BADLs) consist of self-care tasks, include; Dressing, Bathing, Functional mobility, Feeding, Toilet hygiene, Personal hygiene. Instrumental ADLS (IADLs) provide opportunity to an individual to live independent in a community; Taking medication as prescribed, Housework, Shopping, Managing money, Leisure activities, use of telephone. Occupational therapist help C.P patient to participate in (ADLs) which are meaningful to them.(8).

Agce et al., (2015) Conducted study to examine factors affecting independence in activities of daily living in cerebral palsy (CP). The study included 28 children between 4 to 14 years of age who are diagnosed as CP by a pediatric neurologist. Children were excluded from the study if they had any release surgery and/or botox injection during the last 6 months. Caregivers of all children were informed of the study protocol and signed informed consent statements. Data were collected by an experienced therapist. The independence of the children was stated with Wee Functional Independence Measure for children (WeeFIM). Gross and fine motor performance was evaluated with Bruininks-Oseretsky Test of Motor Proficiency (BOTMP), motor impairment of the trunk which includes static and dynamic sitting balance and trunk coordination were analyzed according to Trunk Independent scale (TIS) and hand functioning was evaluated with Abilhand-Kids Scale. The correlation of these measurements with independence was analyzed with Spearman correlation coefficient. There were significant correlation between WeeFIM and BOTMP general-motor function componentt ($p<0.01$). WeeFIM also significantly correlated with TIS score ($p<0.01$) and Abilhand-Kids Scale ($p<0.05$). Motor skills, body balance and upper limb function has an impact on independence in CP. It is obvious that one assessment is not enough for assessment independence and factors affecting independence in CP.(9)

Rosinczuk et al., (2014) Conducted a study in which children with CP struggle with various problems in daily living due to diverse symptomatology which accompanies the central nervous system (CNS) damage. The problems concern both basic self-care activities like dressing, grooming or bathing as well as more complicated activities like reading or social interactions starting and maintaining relationships. This study aims to identify and present daily living problems experienced by the children with CP aged 5 or more. The study was conducted among a group of 130 randomly selected participants, 50 participants were children with CP aged 5–19 and 80 participants were their parents. The author's self-designed questionnaire was used to collect data in the study. Analysis of the collected data shows that according to surveyed parents the most common disorders characteristic for their children are visual disturbance (75%), speech disorder (65%) and intellectual disability (65%),one fourth of children with CP are non-ambulant, wheelchair provides independent mobility for the children or they require personal assistance from another person, problems with balance in vertical position are the most problematic limitation in daily living for the group of surveyed children (68%).Conclusion is that Children with CP struggle with various problems concerning daily living functioning.(10)

Erkin et al., (2010) Conducted study to determine the relationship between feeding and GIS problems in CP patients. GMFC scale was used for severity level of CP and children were classified as quadriplegic, hemiplegic and diplegic. Chi squared test used for comparison. 120 children were enrolled for study. The result indicated that feeding and GIS problems was found to be higher in severe group. One fourth of children

with CP suffer feeding problems and need more time to be allocated to consume meal.(11)

Jean and Abdulrahman, (2007) Conducted study on SDR, Selective dorsal Rhizotomy developed to manage patients diagnosed with cerebral palsy suffering from spastic diplegia. Certain abnormal nerve fibers that cause spasticity in lower extremity are cut to maintain a balance between preservation of function and elimination of spasticity.(12)

Mustafa et al., (2006) Conducted study to determine the age of bowel and bladder control in CP.The study included 45 children with CP, 37 siblings of CP children and 37 healthy children. The mean age of nighttime bladder and bowel control development in CP was 47 months and 45 month, for their siblings 35 month and 26 months and for the healthy children 27 months and 25 months. Among the children enuresis (involuntary urination) was present in 11 of 34 CP children, 7 of 30 siblings, and 4 of 30 healthy children whereas encopresis (involuntary defecation) was present in 5 children with CP, one sibling, and one healthy child. The children with CP gained bladder and bowel control at older age in comparison with their siblings and healthy children.[13]

Edward et al., (2004) Conducted study on "Pediatric Constraint-Induced Therapy (Pediatric CI Therapy)" given on 2 times for a young child with cerebral palsy. In first episode of care, child of 15 months of age was taken for observation. On developmental assessment in ADL's, she scores 5 to7 month below her chronological age. Pediatric CI therapy, involved full arm cast on less affected upper extremity. Intensive intervention for child's more affected upper extremity 6 hours per day for 3 weeks (intervention I). First therapeutic goal activities designed then more challenging activities were designed. To promote the upper extremity independence, Pediatric CI therapy was administered after 5 month (second intervention). The child developed independent grasp, self feeding, reach, etc. The pediatric CI therapist also incorporated everyday tasks so improved quality of upper extremity movement and increased independence.[14]

Nicholson and Morton (2001) Conducted study on lycra garments that are helpful for CP children. 12 children's with cerebral palsy were fitted with lycra garments. All had problems in wearing garments, including problems with incontinence of urine and toileting.[15]

Reilly et al., (1996) Conducted study to determine the prevalence and oral motor dysfunction among a representative sample of 49 children with cerebral palsy (12 to 72 months of age). Children with feeding problems need extra time for feeding. More than one third children were classified as severe oral motor dysfunction and they managed to feed themselves with help of adaptive utensils. Fewer than 15% patient used special feeding equipments. Eight children were able to feed themselves independently. Severe feeding problems are also key point in diagnosis of cerebral palsy in 60% children.[16]

Methodology

The study on this topic is to define the effects on activities of daily livings in children with cerebral palsy. It is a Cross-sectional Study. The study setting was Department of Developmental & Behavioral pediatrics, The Children's Hospital and The Institute of Child Health, Lahore, Rising Sun Institute for special children D.H.A Lahore and PSRD hospital Lahore. Duration of study was three months from 15th October 2014 to 15th January 2015. For Activities of daily living assessment, a valid and reliable tool, Barthel Index ADL's scale was used. Inter-rater reliability of Barthel index is 0.95 and its test-retest reliability is 0.89, as well as it has high correlations (0.74 – 0.8) with other measures of physical disabilities. Purposive sampling technique was used for sampling. The study sample was 50 children with cerebral palsy whose age range from 3 years to 17 years, were selected for the study. All the patients fulfilling the above criteria were evaluated by an Occupational therapist and Pediatricians for the ADL's during the period. Initially, formal permission was taken from the authorities of department then the parents of CP child were approached and their consent was taken. Data was collected by interviewing the parents of Cerebral Palsy who came to Children hospital and Rising Sun Institute and PSRD Hospital. Statistical analysis was done by using SPSS version 21.

Results

Among 50 children of CP, 21 (42%) patients were under the age of 3 to 7 years, 20 (40%) patient were between the age of 8 to 12 years and 9 (18%) patients were between 13 to 17 years old. Among both genders, 27 (54%) were males, and 23 (46%) were females. Frequency of activities of daily living in children with CP was find out. Results showed that they have utmost difficulty in using stairs (58%), mobility (48%) and transfer (40%), need little help in bowels/blader (2%) and no help in dressing and bathing (0%). (Table 1)

Discussion

Cerebral palsy is non progressive disorder that affects the posture, movement and co-ordination due to brain injury. Effects of disability often changes over time and severity ranges from mild to severe. CP patient have many problems in ADL's such as Bowels, Bladder, dressing, feeding, bathing, toilet hygiene, grooming, personal hygiene, mobility, etc. These problems mostly due to motor and sensory impairments.

Many factors affect ADL's independence. Impairment of upper limb (UL) function body balance, fine motor skills are main factor which contributing to decrease ADL's in CP.

Another study aimed to examine factors affecting independence in activities of daily living in cerebral palsy (CP). The study performed by Agce et al., (2015) included 28 children between 4 to 14 years of age who are diagnosed as CP by a pediatric neurologist. Children were excluded from the study if they had any release surgery and/or botox injection during the last 6 months. Caregivers of all children were informed of the study protocol and signed informed consent statements. Data were collected by an experienced therapist. The independence of the children was stated with Wee Functional Independence Measure for children (WeeFIM). Gross and fine motor performance was evaluated with Bruininks-Oseretsky Test of Motor Proficiency (BOTMP), motor impairment of the trunk which includes static and dynamic sitting balance and trunk coordination were analyzed according to Trunk Independent scale (TIS) and hand functioning was evaluated with Abilhand-Kids Scale. The correlation of these measurements with independence was analyzed with Spearman correlation coefficient. There were significant correlation between WeeFım and BOTMP general-motor function componentt ($p<0.01$). WeeFIM also significantly correlated with TIS score ($p<0.01$) and Abilhand-Kids Scale($p<0.05$). Motor skills, body balance and upper limb function has an impact on independence in CP. It is obvious that one assessment is not enough for assessment independence and factors affecting independence in CP.[9]

Mostly CP children have difficulty in ADL's. **Similar study** performed by Rosinczuk et al., (2014) in which children with CP struggle with various problems in daily living due to diverse symptomatology which accompanies the central nervous system (CNS) damage. The problems concern both basic self-care activities like dressing, grooming or bathing as well as more complicated activities like reading or social interactions starting and maintaining relationships. This study aims to identify and present daily living problems experienced by the children with CP aged 5 or more. The study was conducted among a group of 130 randomly selected participants, 50 participants were children with CP aged 5–19 and 80 participants were their parents. The author's self-designed questionnaire was used to collect data in the study. Analysis of the collected data shows that according to surveyed parents the most common disorders characteristic for their children are visual disturbance (75%), speech disorder (65%) and intellectual disability (65%),one fourth of children with CP are non-ambulant, wheelchair provides independent mobility for the children or they require personal assistance from another person, problems with balance in vertical position are the most problematic limitation in daily living for the group of surveyed children (68%).Conclusion is that children with CP struggle with various problems concerning daily living functioning. Small percentage of children with CP are able to move independently. Majority of children with CP are not able to function independently due to the disorders resulting from the brain damage. Management of associated conditions through motor rehabilitation has improved mobility and motor skills in daily functioning of children with CP.[10]

Table I: Frequency of Activities of Daily Livings (ADL's) of CP Patient

Bowels/Bladder	**Incontinent (%)**		**Occasional accident (%)**	**Continent (%)**	**Total (%)**
Bowels	26(52.0%)		1(2.0%)	23(46.0%)	50(100.0%)
Bladder	25(50.0%)		1(2.0%)	24(48.0%)	50(100.0%)
Grooming skill	**Dependent**		**Needs help**	**Independent**	**Total**
Grooming	0		35(70.0%)	15(30.0%)	50(100.0%)
Dressing	25(50.0%)		17(34.0%)	8(16.0%)	50(100.0%)
Toilet Training					
Toilet use	25(50.0%)		13(26.0%)	12(24.0%)	50(100.0%)
Bathing	34(68.0%)		0	16(32.0%)	50(100.0%)
Feeding	**Unable**		**Needs help in cutting**	**Independent**	**Total**
	23(46.0%)		17(34.0%)	10(20.0%)	50(100.0%)
Mobility	**Unable (%)**	**Major help (%)**	**Minor help (%)**	**Independent**	**Total**
Transfer	20(40.0%)	10(20.0)	10(20.0%)	10(20.0%)	50(100.0%)
Mobility	21(42.0%)	6(12.0%)	10(20.0%)	13(26.0%)	50(100.0%)
Stairs	29(58.0%)	0	13(26.0%)	8(16.0%)	50(100.0%)

Mostly C.P children have difficulty in feeding. In the **current research**, 46% CP patient has feeding problems. **Similar study** was conducted by Erkin et al., (2010) to determine the relationship between feeding and GIS problems in CP patients. GMFC scale was used for severity level of CP and children were classified as quadriplegic, hemiplegic and diplegic. Chi squared test used for comparison. 120 children were enrolled for study. The result indicated that feeding and GIS problems was found to be higher in severe group. One

fourth of children with CP suffer feeding problems and need more time to be allocated to consume meal. [11]

In the **current research**, activities of daily livings were observed in cerebral palsy children. It was found that Bowels/Bladder dysfunction was present in most of the CP patient of this study i.e; 52% patient were incontinent, 46% patient were continent and 2% patient were occasional accident in Bowels. In Bladder 50% patient were incontinent and 48% patient were continent. **Similar study** was conducted by Mustafa et al., (2006) to determine the development age of bowel and bladder control in CP. The children with CP gained bladder and bowel control at older age in comparison with their siblings and healthy children. The study included 45 children with CP, 37 siblings of CP children and 37 healthy children. The mean age of nighttime bladder and bowel control development was 47 months and 45 month for the CP children, for their siblings 35 months and 26 months and for the healthy children 27 month and 25 months.[13]

In the **current research**, ability of patient to wear dresses was absent in 50% CP patient and 34% needs help in dressing and only 16% patient were independent in dressing. In the current research, ability of patient to sit on toilet seat was absent in 50% patient, 26% patient needs help and only 24% CP patient was independent. Nicholson and Morton, (2001) conducted study on lycra garments that are helpful for CP children. 12 children with cerebral palsy were fitted with lycra garments. All had problems in wearing garments, including problems with incontinence of urine and toileting. The result of present study show the same result as performed earlier.[15]

Mostly C.P children have difficulty in feeding. In the **current research**, 46% CP patient has feeding problems whereas 20% patient were independent and 34% CP patient needs help in cutting. **Similar study** was conducted by Reilly et al., (1996) to determine the prevalence and oral motor dysfunction among a representative sample of 49 children with cerebral palsy. Children with oral motor dysfunction need extra time for feeding. Severe feeding problems are also key point in diagnosis of cerebral palsy in 60% children. More than one third children were classified as severe oral motor dysfunction and managed to feed themselves with help of adaptive utensils. Fewer than 15% patient used special feeding equipment. Eight children were able to feed themselves independently. [16]

Conclusion

It is concluded that cerebral palsy patients have mild to severe difficulties in performing their ADL's such as Bowels, Bladder, Dressing, Grooming, toilet use, bathing, feeding, mobility. Effects of disability often changes over time and severity ranges from mild to severe. These problems mostly due to motor and sensory impairments.

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