# cerebral palsy

*by* Aziz Ahmad

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# Prevalence of Cerebral Palsy Children in the Population of District Swabi Khyber Pukhtunkhwa and Their Functional Independence

Aziz Ahmad [1], Hamad Ali [2]

## ABSTRACT

**Background:** Cerebral Palsy (CP) is the non-progressive disorder that effects the posture, movements and sensations due to defect in the infant brain. The incident varies from one to another country and from culture to culture.

**Objectives:** The aim of this work is to study the prevalence of cerebral palsy in children at district Swabi. It also aims to develop awareness among the community regarding improving mobility and care of these children.

**Methods:** This study is carried out among children of age 4-10 years of age. The data was collected by a survey questionnaire adopted from Surveillance of Cerebral Palsy in Europe (SCPE) study. Parents of the children were interviewed and completed the questionnaires. Total of 56 union councils were studied between February and June 2014.

**Results:** Two hundred seventy eight (278) children were found as sufferers from CP, out of which were male children. Prevalence rate was recorded as 1.22/ 1000 births. The most affected children were found in the age group of 6 ≤ 8 years. From the 278 children, 109 were severely affected, 112 were moderate while 57 were mildly affected. 49% of the children were suffering from spastic quadriplegia.

**Conclusion:** The prevalence of CP in district Swabi is more similar to the other developing countries in Asia except Turkey which shows the highest prevalence rate 4.4/1000 live births. Prevalence was more is spastic quadriplegic children.

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# Introduction

Cerebral palsy is the non-progressive disorder that affects the movements, posture and sensation due to the lesion or defect in the foetal or infant brain.[1] District Swabi is one of the 24 districts of Khyber Pakhtunkhwa Pakistan. There are 56 union council in it with a population of about 1.3 million [2]. The annual growth rate is 2.96 % [3]**(FALAH Baseline house hold survey Swabi 2010)**. According to **Rosenbaum et al (2006);**

*"Cerebral palsy (CP) describes a group of permanent disorders of the development of movement and posture, causing activity limitation that is attributed to non-progressive disturbances that Occurred in the developing foetal 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."*

The five key elements associated with the cerebral palsy, as listed by Rosenbaum et al (2006) are as;

1. Group of disorders
2. The disorder that permanent and unchangeable
3. Non-progressive disorder
4. Defect or lesion originates in the immature brain
5. Affects movements, posture, or motor function

The purpose of this work is to find out the prevalence of cerebral palsy in District Swabi Khyber Pakhtunkhwa. It also covers the preference to people with cerebral palsy and the existence of facilities in this society for children with CP.

# Literature Review

Only full text papers were searched from the internet and the available online journals. In total thirteen papers were found. Six papers were excluded by reading their abstract, as they were not relevant to the topic. Summary of the seven included papers is given in table I.

The prevalence of CP has been studied broadly and shows variation from country to country. It is the most common neurodevelopment disability in infancy.[4] In the developing countries it shows the prevalence rate ranging from 1.5 to 3 per 1000 live births.[5]

In order to monitor prevalence rate particularly within subcategories (birth weight and by clinical type), it is prerequisite to study the large population. Europe a lot of work has been done on the prevalence of children with CP. The network "Surveillance of cerebral palsy in Europe" is working in eight countries and has fourteen centers. Each center shows variation in the prevalence rate that was measured in member countries with 1.5 to 3 per 1000 live births. While the overall prevalence is measured as 2.2 per 1000 live births.[6]

Besides this, a retrospective study was also done for the prevalence of CP among Asian racial subsections children. A birth cohort, from California, of 11-year period, from 1st January 1991 to 31 December 2002 was selected. The data was collected from main 3 centers. Categorization was done in 13 national origin Asian subcategories according to the number of CP cases were as Filipino (N = 211), Chinese (N = 124), Vietnamese (N = 91), Korean (N = 47),

Indian (N = 46), Japanese (N = 28), Cambodian (N = 24), Samoan (N = 21), Laotian (N = 18), Pacific Islander (N = 11), Guamanian (N = 5), Hawaiian (N = 4), and Thai (N = 4). In 6 221 001 live births 8397 cases were diagnosed with CP with an overall prevalence rate of 1.40/ 1000 live births.[7] In china the prevalence of CP was studied during 1993-1996 and was recorded as 1.6/1000 children, with a higher ration of male to female that is 1.9 and 1.2/1000 live births respectively.[8]

In Turkey, Ayşe & co-workers studied a sample of 41861 children of age ranged from 2-16 years. By applying method of cluster sampling 186 children were diagnosed as suffered from CP and the prevalence was found to be slightly higher than the other developing country (4.4/1000 live births)[5]

Yam et al (2006) conducted a cross-sectional study during September 2003 to June 2004 in Hong Kong. The age group was 6-12 years. The sample population was 435572. 578 children diagnosed with CP hence the prevalence rate was 1.3/1000 live births with male to female ratio as 3:2[9]

During the year 2000, Al-Sulaiman et al selected 178 children diagnosed with CP at King Fahad Hospital Kingdom of Saudi Arabia. The age of the selected children ranged from 1 to 3 years. The duration of the study was one year (January to December 2000). Out of these 109 were male and 78 were female with the ratio 1.4:1[10]. A one year study in Iraq, the case series study, was done in Baghdad at the medical rehabilitation center. Sixty children with CP were attending that center from June 2004 to May 2005. In this study, the male to female ratio was 1.5:1[11].

Based on the literature review and felted need for the rehabilitation of these children in Pakistan it was felt to conduct a research to see the prevalence of this condition in Pakistan and draft future recommendation for the care and uplifting of these children.

| S/no | Study | Study design | Sitting | Population | Sample (n) | Mean age/age | Outcome | variable |
|---|---|---|---|---|---|---|---|---|
| 1 | Serdaroglu, Cansu, Ozkan & Tezcan, 2006. | Cross-sectional | Turkey | 24779569 | 41861 | 2-16 years | Prevalence of CP 4.4/1000 births | Age, sex, socioeconomic status, gestation period. |
| 2 | Liu, Li, Lin & Li, 1999. | Cross-sectional | China: Jiangsu Province | 388192 | 622 | < 7 years | Prevalence rate 1.6 per 1000 live births | Age, sex, birth weight. |
| 3 | Al-Sulaiman, Bademosi, Ismail, Al-Quliti, Al-Shammary, Abumadini, Al-Umran & Magbool, 2003. | Prospective survey | Saudi Arabia: king Fahd hospital | 3 million | 178 | 1-3 years | Male to female CP ratio 1.4:1 | Age, sex, Gestation period, labour & delivery, birth weight, medical history. |
| 4 | Yam, Chan, Tsui, Yiu, Fong, Cheng & Chan, 2006. | Cross-sectional | Hong Kong | 435572 | 578 | 6-12 years | Point prevalence was 1.3 per 1000 children. | Age |
| 5 | Cane, 2000 | Register/ Servey | Europe | 304000 | 668.8 | ≥ 5 years | CP prevalence 2.2 per 1000 live births | Age, birth weight |
| 6 | Lang, Fuentes-Afflick, Gilbert, Newman, Xing & Wu, 2001. | Retrospective cohort | Asia : California | Absent | Asian: 629 542<br>White: 2 109 550 | Absent | Prevalence of Asian & whites: 1.09 vs 1.36 per 1000 | Age, sex, education, birth weight. |
| 7 | Baqir, 2007 | Case-series descriptive study | Iraq:<br>Baghdad | Absent | 60 patient | Absent | male to female ratio 1.5:1 | Age, sex, weight, type of delivery, parent's consanguinity and details about postnatal history |

# Methodology

Community survey (descriptive study) was done to find out the prevalence in District Swabi. It is one of the 24 districts of Khyber Pukhtunkhwa Pakistan with a total population of around 1.3 million and annual growth rate of 2.96 %[3] The total number of union councils are 56 in it[2]. The camps were organized in each union council. People were informed to bring their children who have had any sort of disability with complains of delayed mild stones, through social mobilizers and community elders. The clinical assessment/ screening were done and questionnaire was filled from the parents of children, aged 4-10 years. Our main goal was to measures the prevalence and functional independence (perform the daily activities). Some additional information were also recorded as per the questionnaire. The rural and urban areas were identified. For finding live births per year the census data were used.

## Study questionnaire

A questionnaire was adopted from the research paper "Surveillance of Cerebral Palsy in Europe (SCPE)" which comprises of five parts (Cans, 2000).

Part one is about personal information.

Part two is regarding the diagnosis of cerebral palsy, it comprised of 10 questions (closed ended to get response "Yes" or "No").

The part three comprised of questions about the type of CP.

Part four consist of GMFS scale and in part five was severity level on the basis of GMFS.

## Data collection

Data was collected using the structured questionnaire by the parents of the affected children. The time duration for the data collection remained 02 months, all the 56 union councils of District Sawabi were covered.

## Inclusion/exclusion criteria

### Inclusion criteria

- Age 4-10 years
- Within District Swabi
- Fulfills the definition of CP

### Exclusion criteria

- Age : less than 4 ,more than 10 years
- Refuges or internally displaced people
- Disease which is progressive

## Data evaluation

The data collected was organized on MS excel sheet for all 56 union councils.to avoid any overlapping of the data each union council was recorded separately. Thirty four forms were excluded due to high and low age limit and because of patients with muscular dystrophic. All the data analysis was done on Microsoft excel program.

# Results

Two hundred seventy eight children were diagnosed with CP in the 56 union councils. Three groups were identified as 4 < 6, 6 < 8 and 8 < 10 years of age. The overall prevalence was found as 1.22 per 1000 live births with male to female ration as 2.2:1(males 191, females 87) Table II summarizes the result as below.

| | Gender | | | | | |
|---|---|---|---|---|---|---|
| ***Age*** | **Male** | **%age** | **Female** | **%age** | **Total** | **%age** |
| ***4-<6*** | 42 | 68.85245902 | 19 | 31.14754098 | 61 | 21.94245 |
| ***6-<8*** | 75 | 70.09345794 | 32 | 29.90654206 | 107 | 38.48921 |
| ***8-10*** | 74 | 67.27272727 | 36 | 32.72727273 | 110 | 39.56835 |
| ***Total*** | 191 | 68.70503597 | 87 | 31.29496403 | 278 | 100 |

Table II, Distribution of CP children according to age and gender

Prevalence among the three groups (age wise) varied. It was higher in the age group of 6 < 8 year than other age groups. Age wise results are shown in table III below.

| **Age groups** | **Sample(n)** | **Prevalence** |
|---|---|---|
| **4-<6** | 61 | 0.093846154 |
| **6-<8** | 107 | 1.646153846 |
| **8-10** | 110 | 1.128205128 |
| **Total** | 278 | 1.221978022 |

Table III, Prevalence according to age group

Analysis on the basis of area of residence show that the situation in the urban areas is worse comparing to the rural table IV below show the results recorded.

| **Area** | **Sample (n)** | **%age** | **Prevalence** | **area %** |
|---|---|---|---|---|
| **Rural area** | 23 | 8.27 | 0.01 | 8.33 |
| **Urban area** | 255 | 91.73 | 1.12 | 91.67 |
| **Total** | 278 | 100 | 1.22 | 100 |

Table IV, Prevalence according to area

While analyzing subtypes of CP, children with Quadriplegia ranked higher as 50%, followed by diplegia 18%, hemiplegia 11 % while monoplegic children were around 2 %). The number of

hypotonic children remaind as 18%. Table V below shows the results of children suffered from different conditions of CP.

| Type | Sample (n) | %age |
|---|---|---|
| **1. Spastic** | | |
| **a. Quadriplegia** | 138 | 50 |
| **b. Diplegia** | 50 | 18 |
| **c. Hemiplegia** | 31 | 11 |
| **d. Monoplegia** | 5 | 2 |
| **2. Ataxic** | 3 | 1 |
| **3. Hypotonic** | 51 | 18 |
| **Total** | 278 | 100 |

Table V Distribution of children according to the type of CP

The functional independence of every Child is measure according to GMFS. Most of the children have severe disability. About 39 % of affected children were found to be of level V GMFS. These children are unable to perform motor function and to hold their head against gravity. 40% were found to be at level III and IV a[7] unable to maintain the alignment and posture without hand support. These patients can attain self-mobility for short distance (within room or lawn) by rolling and creeping on the abdomen without legs movement. The remaining (about 21%) children were mildly affected as they can walk without assistance and manipulate objects easily but impairment present and delayed milestones. Table VI shows the number and percentage of the affected children according to GMFS levels.

| GMFS | Sample (n) | %Age |
|---|---|---|
| **I** | 9 | 3.23741 |
| **II** | 49 | 17.6259 |
| **III** | 28 | 10.07194 |
| **IV** | 84 | 30.21583 |
| **V** | 108 | 38.84892 |
| **Total** | 278 | 100 |

Table VI Distribution of children according to GMFS

According to GMFS level I, II children lies in mild category. Level III, IV lies in moderate category while level V is the more severe condition of the patient. This distribution is given below in table. VII.

| | Sample (n) | %age |
|---|---|---|
| **Mild** | 57 | 20.5036 |
| **Moderate** | 112 | 40.28777 |
| **severe** | 109 | 39.20863 |
| **Total** | 278 | 100 |

Table VII distribution of children according to severity

# Discussion

This is the first kind of study conducted at Distric Swabi including the data from all 56 union councils. The average prevalence rate of CP is 1.5 – 3 per 1000 live births in the developing countries. However the overall prevalence was found as 1.2/1000 live births in our study. The findings of Lie et al (2001) with 1.4/ 1000 live births is higher to our results. Comparing with the data from Turkey, where the rate was as high as 4.4/1000 live births [5]. It is very positive that the prevalence in our study was even lower to finding in the European countries which is 2.2/1000 live births [6].

Gender wise it was recorded that male children were more affected than female children (2.2:1) which is showing some similarity with the findings of Liu et al (1999), however the ration was higher in their results (3:2). The male affected children in Iraq and Kingdom of Saudi Arabia are little lower than our finding [10].

While discussion the urban and rural area wise findings it was recorded higher and lower respectively, which is the similar case found in Turkey [5]. No study was found to address the severity level among the CP caffecteed children. Therefore, the findings in this study can not be compared.

# Conclusion

The prevalence of CP show variations as stated above so, the overall prevalence in district Swabi was more similar to the other developing countries except turkey which shows a high prevalence rate 4.4 per 1000 live birth. This variation may also be due to different methodology and the study design used in the report. As the results of this study cannot be generalized because the data collected is only from one district and the sample was not as adequate as it should be. Therefore, it is recommended to have a comprehensive research in Pakistan including more districs from all provinces with a good sample size. This work will enable to have to clear picture of the affected children in the country. Furthermore, it also recommended that efforts to be made at public and private level to look after the rehabilitation aspect of these children.

# References

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| 14 | Eddison, N., and N. Chockalingam. "The effect of tuning ankle foot orthoses-footwear combination on the gait parameters of children with cerebral palsy", Prosthetics and Orthotics International, 2012.<br>Publication | <1% |

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