

## Risk factors and clinical profiles in Iraqi children with cerebral palsy

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### Abstract

**Background:** The aim is to assess the significant of risk factors in cerebral palsy (CP), clinical profiles and gross motor function level of Iraqi children with CP and significances of brain congenital anomalies in Iraqi CP.

**Patients and methods: Results:** 475 children with CP were in the neurosciences hospital during the period from the first of May 2005 to the first of September 2008. 303 (64%) were males and 172(36%) were females. Age range between 10 months to 150 months (mean age 80 months).

**Results:** 43% of the cases were spastic diplegic CP,19% were hemiplegic CP,15% were quadriplegic CP,7% were athetoid CP and 16% were other or unclear(mixed or ataxic cp ).The most frequently encountered risk factor were preterm delivery, birth asphyxia consanguinity and neonatal jaundice in consequence.

**Conclusion:** Prematurity and birth asphyxia are the most important risk factors

### Introduction

Cerebral palsy is a state of encephalopathy that may be defined as a non progressive disorder of posture and movement, often associated with epilepsy and abnormalities of speech

, vision and intellect resulting from a defect or lesion of developing brain. CP is a common disorder, with an estimated prevalence of 2/1000 population. CP is the third most common major developmental disability, after autism and mental retardation. The diversity of individuals with cerebral palsy together with the range of severity and complications make this condition a challenge for health care system.

Although the diagnosis of cerebral palsy refers only to the presence of a non progressive motor impairment ,children with cerebral palsy experience a range of co-morbid conditions including mental retardation, sensory impairment and seizures.

Children with CP experience a change in motor function with age and development, it is important to consider these expected changes in offering a prognosis, or in assessing differences in motor function after an intervention, the gross motor function classification system (GMFCS) for CP has been developed for these purposes[1-4].

The aim of this paper is to report the clinical profiles and gross motor function levels of Iraqi children with CP.

## Patients and methods

Neuroscience Teaching Hospital is the first and largest hospital having pediatric neurology department with rehabilitation department with professional management. The pediatric neurology out patient, word and rehabilitation clinic of the hospital provides full management to those children with various neurological disabilities, primarily CP.

During the period from the first of May 2005 to the first of September 2008, 475 patients with CP were observed in neurosciences teaching hospital. 303(63.78%) were males and 172(36.21%) were females, with ages ranging between 10 months and 150 months (mean age 80 months).

Factors causing CP were investigated by interviewing with the families and by reviewing their records.

Risk factors were registered as consanguineous marriage, maternal disorders (chronic disorder such as diabetes mellitus, hypothyroidism, or acute severe illness during pregnancy), preterm birth (gestational age less than 37 weeks), birth asphyxia (those with delayed crying), low birth weight (LBW) (birth weight < or= 2500gm), neonatal convulsion, kernicterus, postnatal CNS infection and brain injury.

The cases with CP were classified, using the Swedish classification, into spastic tetraplegia, diplegia, hemiplegia, ataxic, dyskinetic (athetosis and dystonia) and mixed types, cases with mixed or unclassified were examined under other or unclear group.

The gross motor function classification system (GMFCS) was used to classify severity of limitations in gross motor function [5]

The GMFCS provides a standardized system to classify the gross motor function of children with CP into five levels (the level 1 the least severe to level 5 the most severe).

A CT-scan finding also included in the study to evaluate the significance of CT in CP. Data were entered into excel and analyzed.

## Results

The most frequently encountered factors were preterm, asphyxia, consanguinity and neonatal jaundice. The frequency of risk factors and types of CP according to the Swedish classification are shown in table-1. No risk factor were found in 98 (20.63%) children with CP, while 128(26.94%) had more than one risk factors. Distribution of CP types

Risk factors	N	(%)
Prematurity	135	(28.42%)
Asphyxia	126	(26.52%)
Consanguinity	123	(25.89%)
Neonatal jaundice	87	(18.31%)
Neonatal seizure	21	(4.42%)
PN	19	(4%)
Low birth weight	3	(0.63%)
AP	11	(2.3%)

  

Type	N	(%)
Spastic diplegia	202	(42.52%)
Spastic hemiplegia	92	(19.36%)
Spastic quadriplegia	69	(14.52%)
Unclear	77	(16.21%)
Athetoid	35	(7.36%)

**Table (1): The frequency of risk factors and various types of CP.**

Distribution of risk factor in relation to type of CP: In hemiplegic CP, the main risk factors are asphyxia and consanguinity

	Hemiplegia	Spastic diplegia	Spastic quadriplegia
Prematurity	12(11%)	80(30.3%)	26(26%)
Asphyxia	25(22.93%)	48(18.2%)	25(25%)
Consanguinity	15(13.76%)	49(18.56%)	25 (25%)
Neonatal seizure	5(4.6%)	9(3.4%)	3(3%)
Neonatal Jaundice	8(7.3%)	30(11.36%)	13(13%)
Postnatal	7 (6.4%)	7(2.65%)	1(1%)
Antipartum	3 (2.75%)	3(1.13%)	2(2%)
LBW	1(0.9%)	1(0.37%)	0
No risk	33 (30.3%)	36(13.63%)	5(5%)

#### Distribution of risk factor in relation to type of CP

(22.93%, 13.76% respectively); spastic diplegia mainly preterm baby is the main risk; spastic quadriplegia were preterm asphyxia and consanguinity (26%, 25%, 25% respectively); shown in table-2.

#### Discussion

CP is the most common cause of physical disability in childhood, it makes substantial demands on medical, educational, therapeutic and social services [1-4]. In this study male were predominant (64%) and male to female ratio (1.8:1), which was nearly the same as in the Swedish study[6].

Factors playing a role in CP etiology are numerous and most interact with one another, for example, preterm birth is more frequent in twin pregnancies. It is correct, when a statistical analysis is being made in such a child, to register the risk factor as twin pregnancy or preterm birth. It is difficult to make a decision in this situation. This pose difficulties in data interpretation and statistical analysis in studies concerning with risk factors of CP. In this study one child may have been exposed to two or

more risk factor and we chose premature as cardinal risk factor rather than low birth weight and multiple pregnancies when it predominates. Another problem in developing countries like Iraq is the insufficiency of national obstetrics and neonatal medical record system.

We assume that our hospital reflects the country's data to a great extent, as it is the largest national neuroscience center, to which doctors throughout the country refer many children with pediatric disability.

Among the risk factors detected in our study, the most frequent one were, respectively, preterm, asphyxia, consanguineous marriage and neonatal jaundice. Several studies report preterm birth as the most frequent risk factor [7, 8, 9].

Another risk factor is birth asphyxia, which was determined to be as high as 27% in this study cases, birth asphyxia ratio observed in children with CP differ from study to an other; 6% reported by Naeye et al.1989 [9] or 34.6% in Turkish study or 37.3% in an other study [10].

The most interesting finding in this study is consanguinity founded in about 26% which is similar to Turkish figure of 24% [7]. Consanguinity was reported as

being among risk factors only in a few previous studies. A paper from Saudi Arabia reported that 56 consanguineous marriages were observed among 103 cases with CP and that CP risk in cases with consanguinity was approximately 2.5 times higher than those without consanguineous marriage [11]. In UK [10] consanguinity was associated with variable prevalence of CP in non Asian and Asian populations. Unfortunately consanguineous marriage is a serious public health problem in Iraq and it has a significant role in many diseases.

Neonatal jaundice is an important risk factor and in our study constitute about 18% of risk factors and the type mostly chorioathetoid type and it is similar to the Turkish study 17% [12].

In this study 20.63% children with CP have no risk factor, which is similar, the Turkish study figure of 20.6%. ,whereas more than one risk factor was found in (27%) of the our cases while in Turkish study more than one risk factor is 62% ;and in the Saudi Arabia 47% of the cases did not have any significant risk factors, whereas more than one risk factor was determined in 21% of cases[11].

In this study diplegic CP had mostly 2 and 3 level and tetraplegic CP mostly in level 4 and 5 .Kulka et al in a study comparing spastic diplegia and tetraplegia found it to be mostly in level 1 and 2 whereas spastic tetraplegia children were observed to be mostly in level 4 and 5[13],while in Turkish study spastic diplegic CP mostly in level 3 and 4 and tetraplegic CP mostly in level 4 and 5 , the spastic diplegic in between the above studies which is promising in our country in such environment.

It is recognized that there is a higher prevalence of congenital anomalies in

children with CP than in general population[14], the proportion of CP in our study with brain malformation was 9% mostly hemiplegic CP, in other study range from 1.9% [15] and 14%[16] with CP have a recognized brain malformation.

About half (49%) of the cases who have undergone neuro-imaging demonstrated strong evidence for acute brain injury occurring around the time of birth, these neuro-imaging findings included acute perinatal focal arterial infarction, hypoxic ischemic brain injury (result in generalized brain atrophy) and intracranial hemorrhage that correlate with significant risk factor that's birth asphyxia, in other study done in northern California were one third with cp demonstrated evidence of acute brain injury[16].

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