Maternal Age and Consanguinity as Risk Factors for Cerebral Palsy Combine Mental Retardation among Children in Erbil City/Kurdistan Region

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Abstract

The incidence of childhood Cerebral Palsy combine mental retardation (MR) remains an alarming situation in Erbil city. The current retrospective study was designed to determine whether consanguinity and maternity age are major risk factors to educate the population and define intervention methods. A total of 100 children diagnosed with MR of unknown etiology were included in this study. Overall prevalence of consanguinity was 60%, of mothers were about 24% were within normal range for maternal age, with equal representations for the 20−25 and 25−30 age groups. While 75% with abnormal range for mother age old. Consanguinity and mother’s age does predict mental retardation.

Keywords: Cerebral palsy, Mental retardation, Consanguinity, Maternal age.

Introduction

Cerebral palsy CP is one of the most common neurodevelopmental conditions in childhood, affecting 2-3 in 1000. While motor impairment is the diagnostic basis, the disorder often presents with associated symptoms and a wide range of related impairments such as epilepsy, pain, and cognitive and communicative impairments[1]. Cerebral palsy is a common developmental disability first described by William Little in the 1840s. Cerebral palsy is primarily a disorder of movement and posture. It is defined as an umbrella term covering a group of non-progressive, but often changing, motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of its development[2]. Type of cerebral palsy spastic CP is the most common type of cerebral Palsy, the names of these types combine a Latin prefix describing the number of affected limbs (e.g., di-means two) with the term plegia or paresis, meaning

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paralyzed or weak. Diplegia-either both arms or both legs. Hemiplegia-limbs on only one side of the body. Quadriplegia-all four limbs. Monoplegia-one limb (extremely rare). Triplegia-three limbs (extremely rare)[3].

Mental retardation (MR) is a serious and lifelong disability that has devastating effects on society and the health system. About 3% of children worldwide manifest some degree of MR but its pathogenesis is poorly understood. Causes of MR are numerous and include genetic and environmental factors. Despite thorough evaluation, the etiology could not be determined in 30-50% of cases (4).

The ability to determine a cause of mental retardation is based largely on the use of specific diagnostic tools. In a given diagnostic setting, the physician or clinician depends on their availability and guidelines for application (5). Therefore, the present study aimed to evaluate whether maternal age and consanguinity are risk factors for CP among children in Erbil city, Kurdistan region.

**Materials and Methods**

Study design: a descriptive study based on hospital records. Study setting: pediatrics Helena central – Erbil city. Population: 100 patients who were admitted with diagnosis of cerebral palsy form 1/11/2015 till 30/1/2016. This retrospective study was conducted on 100 children diagnosed with MR of unknown etiology from with a mean age of (1-17 years). All the evaluation was done through an official request. Information on maternal age at the time of birth of the child and consanguinity was obtained from the medical records. Maternal age was then divided into 6 groups ranging from 15 to 45 years. (1) 15−20 (2) 20–25, (3) 25−30, (4) 30−35, (5) 35−40, (6) more than 40 years. Study variables: Risk factors of cerebral palsy such as mother age, consanguinity, gender. All the evaluation was done through an official request. Information on maternal age at the time of birth of the child and consanguinity was obtained from the medical records.

**Result**

The 100 children with mean maternal age of (26.5), 55 (55%) males and 45 (45%) females were classified according to the age of their mother at birth Fig.1.

Table 1 shows, about 24% were within normal range for maternal age, with equal representations for the 20–25 and 25–30 age groups. While 75% with abnormal range for mother age.
Table 1: Number of mothers in different age groups

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-25</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>25-30</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>30-35</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>35-40</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>40-45</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Age distribution of patients

Sixty percent mothers were related to the father to some degree (Table 2), the closest relatives being . Each class of relatives were equally represented, namely first degree, second degree and no relatives. These data indicate that the parents of children with CP in Erbil city are generally mothers with extremely high incidence of consanguinity.

Table 2: consanguinity between patients

<table>
<thead>
<tr>
<th>Status</th>
<th>First relative</th>
<th>Far relatives</th>
<th>Not relatives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36</td>
<td>24</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 2 shows the number of participants in each consanguinity group. Strong consanguinity was observed in 36% (n = 36) of the parents (first degree); 24% (n = 24) were second degree; about 40% (n = 40) were not married to any of their relatives and thus showed consanguinity. These results indicate that consanguinity and mother’s age
at birth predicted the presence of mental retardation of unknown causes amongst group of patients in Erbil city.

![Figure 2. Distribution of study participants according to the degree of consanguinity](image)

**Discussion**

Most definitions of cerebral palsy refer to the condition being the result of damage to the immature brain. Crucial to this definition is the age at which the brain is no longer considered immature. Blair and Stanley included those cases where the potentially brain damaging event had been recorded before the age of 5 years.

Older maternal age was associated with increased risk of mental retardation. This age effect was only seen in the lowest education group. In terms of risk for the population, it was younger mothers with 12 years of education or less whose births were associated with the greatest proportion of mental retardation. From a public policy point of view, children born to mothers with low level of education are an important group to target for prevention/early intervention efforts [6].

Maternal age and consanguinity are debatable causes of MR among children [7], and the existing literature reports conflicting findings. In South Jordan, the consanguinity rate still high [8,9].

Similar studies were conducted in other areas. A study conducted in Iran [10] reported 77% of the consanguineous marriage resulting in MR children were among relatives with half of them being among first cousins. An earlier global profile of Jordan (2002-2006) revealed that 20-30% of all marriages occur between first cousins. Incidentally, they constitute 69% of the marriages bearing children diagnosed with autosomal recessive conditions, 22% of marriages bearing children diagnosed with dominant X-linked and chromosomal conditions, and 41.7% of marriages with sporadic...
undiagnosed conditions [11]. We found the similar results reporting 23% of all consanguineous marriages bearing childhood MR were between first. Another study conducted in a selected region of the Israeli Arab community found that 68% of children with mental retardation were the offspring of consanguineous marriages [12]

Conclusions

Mental retardation affects both males and females equally. The overall prevalence of consanguinity was 60%, and 40% of mothers were more than 30 years old. Consanguinity and mother’s age does predict mental retardation.

References