Etiology of Fourth and Sixth Nerve Palsies: a Single Ophthalmology Clinic’s Perspective

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Abstract

Purpose: To ascertain the etiology of fourth (CN4) and sixth nerve palsies (CN6) in an ophthalmology clinic.

Methods: This retrospective study consisted of 176 patients with fourth and sixth nerve palsies in a strabismus clinic. Demographic features and etiology were recorded.

Results: One hundred and three patients with fourth nerve palsy and 73 patients with sixth nerve palsy were enrolled in the study. The median follow up was 2 (1-4) years. The most common cause of the palsy was congenital palsy in CN4 group (37.0%) and trauma in CN6 group (24.7%).

Conclusions: Trauma and congenital palsies were the leading causes of fourth and sixth nerve palsies as described in the literature.

Keywords

Cranial nerve palsy, Fourth nerve palsy, Paralytic strabismus, Sixth nerve palsy

Introduction

Patients with paralytic strabismus comprise an important number of patients of ophthalmology clinics as well as of neurology and neuro-ophthalmology clinics. The etiology of the palsy of fourth and sixth nerves may be numerous and differ from one clinic to other in terms of patients' demographics and referral pattern.

The purpose of the study was to ascertain the etiology of fourth and sixth nerve palsies in an ophthalmology clinic and to define the clinical features.

Materials and Methods

The series consist of patients with paralytic strabismus due to fourth or sixth nerve palsies who were seen in Strabismus Clinic between January 2001 and January 2011. The medical records of patients were reviewed upon approval of the institutional ethics committee was obtained. Demographic data and etiology of the palsy were recorded. All patients having acquired nerve palsy were referred to neurology department in order to elucidate the underlying causes.

Cases were classified on the basis of etiology as: congenital, trauma, vascular disease (hypertension and diabetes mellitus), intracranial mass, other (lymphomas of the central nervous system, acute myeloblastic lymphoma) and undetermined.

The patients were divided into two groups according to the type of the nerve palsy they had. Patients with fourth nerve palsy were classified as CN4 group and patients with sixth nerve palsy were categorized as CN6 group.

Statistical analyses were performed using SPSS software for Windows version 15.0 (Statistical Package for the Social Sciences, SPSS, Inc., Chicago, IL). Arithmetic mean, standard deviation, median, range, frequency and percentage were used as descriptive statistics. Comparisons were made by Wilcoxon signed rank, Mann Whitney and Pearson chi-square tests. Results were accepted as statistically significant when p was <0.05.

Results

One hundred and seventy six patients with fourth (103/176) and sixth nerve palsies (73/176) were enrolled in the study. The mean age, gender and laterality distribution within groups were described in detail in Table 1. When the mean age of each group was compared, the difference between two groups was found as significant. (p=0.001) Patients with sixth nerve palsy were significantly older than those who had fourth nerve palsy. The median follow up time was 2 years (1-4) for each group.

The underlying etiologies for palsies were shown in Table 2. The leading determined etiological factor was congenital palsy in CN4 group (39/103, 37.9%) and trauma in CN6 group (18/73, 24.7%).

Discussion

In the present study, a retrospective review of cases with fourth and sixth nerve palsies was performed in a strabismus clinic. Many reports are available in the literature concerning etiology of cranial...
Lymphomas of the central nervous system and acute myeloblastic lymphoma.

Table 1: Clinical and demographic characteristics of patients with cranial nerve palsies.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Groups</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>CN4</td>
<td>CN6</td>
</tr>
<tr>
<td>Mean Age (±SD) (years)</td>
<td>22.5±19.1</td>
<td>35.1±21.4</td>
</tr>
<tr>
<td>Gender No. (%)</td>
<td>Male</td>
<td>64 (62.1)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>39 (37.9)</td>
</tr>
<tr>
<td>Laterality No. (%)</td>
<td>Unilateral</td>
<td>100 (97.1)</td>
</tr>
<tr>
<td></td>
<td>Bilateral</td>
<td>3 (2.9)</td>
</tr>
</tbody>
</table>

*p=Pearson chi-square test

Table 2: Etiology of fourth and sixth nerve palsies.

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Nerve Palsy No. of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fourth</td>
</tr>
<tr>
<td>Congenital</td>
<td>39 (37.9)</td>
</tr>
<tr>
<td>Traumatic</td>
<td>13 (12.7)</td>
</tr>
<tr>
<td>Vascular</td>
<td>13 (12.7)</td>
</tr>
<tr>
<td>Intracranial mass</td>
<td>- (0)</td>
</tr>
<tr>
<td>Other</td>
<td>10 (9.8)</td>
</tr>
<tr>
<td>Undetermined</td>
<td>27 (26.9)</td>
</tr>
<tr>
<td>Total</td>
<td>103 (100)</td>
</tr>
</tbody>
</table>

Aknowledgment

The study was conducted in Hacettepe University Faculty of Medicine, Department of Ophthalmology, Ankara, Turkey.

References


This study needs to be viewed in light of the following limitations: the results reflect the numbers of a single referral center and may have caused selection bias as mentioned many times in the text. All patients with acquired palsy were seen by a neurologist but neuroimaging was not available for all of them. Cranial imaging was arranged in cases of clinical suspicion for underlying neurological problems. Patients who were followed in neurosurgery clinics may have been omitted and only patients having manifested ocular misalignment may have been referred. Therefore, the present study should not be considered as a population based study. However, the results may give a basic idea to a clinician about possible reasons of cranial nerve palsies without regard of his profession.

With respect to the study results, the following topic is worthy of note: the etiologies of cranial nerve palsies. Finally, the management of a patient with paralytic strabismus is complex and requires multidisciplinary approach and certain follow-up period.