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ORIGINAL ARTICLE

The causes and treatments of 47 children with facial nerve palsy experienced in two hospitals in northern Greece

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Abstract:

Objective: to review and analyze the etiology, management and outcome of facial palsy in children. Methods: retrospective study of 47patients of Northern Greece less than 15 years diagnosed with facial nerve palsy from 2000 to 2011. Results: a total of 47 patients (25 female, 22 male) with a mean age of 9 years were included. Causes of facial palsy were infectious (22 patients, 46.8%), Bell's palsy (18 patients, 38.3%), trauma (4 patients, 8.5%), congenital (2 patients, 4.3%), or other (1 patient, 2.1%). The left side of the face was involved in 55.3% of the cases. Facial palsy was more frequent at ages between 6 and 10 years with prevalence 42.6%. Between these ages the most frequent causes were Bell's palsy (45%) and infectious causes (45%). Conclusions: in this study the most common cause of facial palsy was infectious conditions followed by Bell's palsy. In Bell's palsy there was no significant difference in the recovery rate between the groups with or without prednisolone treatment.

Keywords: *facial palsy, children, epidemiological, etiology*

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Introduction

Facial nerve palsy appears as a quite uncommon condition among pediatric patients. The incidence rate of facial palsy varies from 15-40 per 100.000 people per year [1]. In children facial palsy occurs 2 to 4 times less often than in adults [2]. Etiological factors for facial palsy include infectious causes, trauma, neoplasms, congenital disorders, and metabolic causes. However, idiopathic facial palsy or Bell's palsy seems to be the most common cause of facial palsy [3]. The prognosis and outcome of facial palsy vary and depend on the underlying condition and the management [4]. The treatment of idiopathic facial nerve palsy is controversial, although the use of steroids early at onset of palsy significantly improves the chances of complete recovery [3]. The aim of the present study is to report our experience of the clinical course, etiology, treatment and outcome of facial palsy in Greek children.

Patients and methods

The retrospective study included 47 children under 15 years of age with facial palsy, attended the 2nd Department of Pediatrics in ''AHEPA'' Hospital and the 4th Department of Pediatrics in "Papageorgiou" Hospital, Aristotle University of Thessaloniki, from December 2000 to December 2011. Their demography, etiology, treatment and outcomes were reviewed.

All patients underwent neurological examination and extended laboratory tests which included bacterial and viral cultures, blood count, IgA antibodies for

Mycoplasmal pneumonia, IgG and IgM antibodies for Epstein-Barr virus. The estimation of whether the palsy was complete or incomplete was based on clinical observation of the patient's facial movements. The degree of facial function was rated using the House-Brackman classification. The recovery time was defined as the period between the onset of facial palsy and complete recovery.

Results

Demography

From 2000 to 2011, 47 children from Northern Greece with a mean age of 9 years suffering from facial palsy were collected. There were 25 female and 22 male patients with ages ranging from birth to 15 years. Most patients were distributed in the 6-10 years age group (42.6%). There were 26 left and 21 right sided facial palsies. All patients had complete facial palsy (the forehead was involved in the motor defect) except one patient 2.5 months old with congenital incomplete facial palsy (the forehead was not involved in the motor defect) (Table 1).

Table 1. Demography of facial palsy in 47 children

Parameter	Number (%)	Recovery (%)
Total	47	36 (76.6)
Age distribution (years)		
0-5	9	4 (44.4)
6-10	20	20 (100)
11-15	18	12 (66.7)
Gender		
Male	22	14 (63.6)
Female	25	22 (88)
Sides		
Right	21	14 (66.7)
Left	26	22 (84.6)
Etiology		
Infection	22(46.8)	16 (72.7)
Bell's	18 (38.3)	15 (83.3)
Trauma	4 (8.5)	3 (75%)
Congenital	2 (4.3)	1 (50%)
Other	1 (2.1)	1 (100)

Etiology

Regarding the etiology of facial palsy in children (Table 1), the most common cause was infection (22 patients, 46.8%), followed by Bell's palsy (18 patients, 38.3%), trauma (4 patients, 8.5%), congenital anomalies (2 patients, 4.3%) and other conditions (1 patient, 2.1%).

Bell's palsy

Of the 18 patients with Bell's palsy, 12 patients received oral prednisolone (1mg/kg/day) for 7-10 days. Normal function (grade I in House-Brackman scale) returned to 9 from 12 patients within 3 months. Meanwhile, 6 patients received no medication and all of them recovered completely (grade I facial nerve function in House-Brackman scale) within 3 months.

In the steroid medication group, we also analyzed the relationship between the interval before starting treatment and the outcome. The period from onset of facial palsy to starting medication was divided into two groups: (a) starting medication within 1 week (11 patients), and (b) those starting medication after 1 week (1 patient). All patients from both groups recovered completely (grade I in House-Brackman scale) within 3 months and none of them had recurrent attacks.

Infection

There were 22 cases (13 male, 9 female) with infectious causes of facial palsy. 14 patients had left facial palsy and 8 patients had right facial palsy. 2 patients (9.1%) was at 0-5 years age group, 9 patients (40.9%) at 6-10 years age group and 11 patients (50%) at 11-15 years age group. The majority of patients (17 patients) had previous infection of upper respiratory system (2 of them had IgA antibodies for Mycoplasma Pneumonia and the rest 15 had negative blood bacterial cultures) and 4 patients presented with acute otitis media. 1 patient had IgM and IgG antibodies for Epstein-Barr virus. From 22 patients with infectious causes of facial palsy, 17 patients (77.3%) received prednisolone medication (1mg/kg/day for 7-10 days). From the 5 patients with infectious causes of facial palsy who did not receive prednisolone medication only 2 did not recover (grade V facial nerve function in House-Brackman scale) . The one of them was a 4.5 years old male child who had a varicella zoster virus infection 1 month before the onset of facial palsy.

Trauma

There were 4 patients (2, 2.5, 6.5 and 11 years old respectively) whose palsy was caused by head injuries. All of them had complete facial palsy and a normal neuroimaging with Magnetic Resonance

Table 2. A literature review of etiology of facial palsy in children

Study	Idiopathic (%)	Trauma (%)	Neoplasm (%)	Congenital (%)	Infection (%)	Other (%)	Total
Manning et al. (1972) [6]	60.7	11.5		3.3	14.8	9.7	61
May et al. (1981) [7]	42	21	2	8	13	13	170
Grundfast et al. (1990) [8]	16	24	12	8	28	12	25
Evans et al. (2005) [9]	8.6	34.3	2.8	11.4	37.1	5.8	35
Shih et al. (2008) [10]	78.6	7.1	5.4	5.4	3.6		56
This study (2012)	38.3	8.5	2.1	4.3	46.8		47

Imaging (MRI) or Computed Tomography (CT). Only the patient (2.5 years old) with head injury at 40th day of life had persistent defects recover (grade VI facial nerve function in House-Brackman scale) despite the fact that he received prednisolone medication. The other three patients recovered totally (grade I facial nerve function in House-Brackman scale) within 3 months after prednisolone treatment.

Congenital

Two patients had congenital facial palsy. Their family histories were unremarkable. Case 1 was a female 12 days fullterm infant with complete left facial palsy from an uncomplicated delivery with caesarian section. The facial nerve functions of case one recovered and reached grade I in House-Brackman scale after treatment with prednisolone (1mg/kg/day for 7-10 days). Case 2 was a male 2.5 months old with incomplete right facial palsy (grade VI facial nerve function in House-Brackman scale) from an uncomplicated fullterm delivery. Case 2 did not show any recovery despite the fact that he received prednisolone treatment (1mg/kg/day for 7-10 days).

Other causes

There was one male patient 9 years old with complete right sided facial palsy who was diagnosed with Neurofibromatosis type 1 (NF1). The patient had multiple cafe´au lait spots 5 mm in greatest diameter and a first-degree relative (father) with NF1 by the criteria of the National Institutes of Health Consensus Conference 5. The patient underwent a brain MRI which revealed abnormal high MR signal located on basal ganglia lateral and left hippocampus, findings compatible with NF1.

Discussion

In this study, we demonstrated that infectious were the most common causes of facial palsy, making up 46.8% of the causes in 47 children of Northern Greece aged less than 15 years. A literature review of etiology of facial palsy in children is resumed in Table 2. In our study, there was no predominance in gender or side affected (55.3% of patients had left facial palsy). Ages between 6-10 years of age were more affected accounting for 42.6% of patients with facial palsy. At this age group Bell's palsy (45%) and infectious causes (45%) were the most common causes.

Bell's palsy was the second most common cause of facial palsy in our experience (38.3% of the causes in 47 patients). In our study, there was no predominance in side involved but there was a female predominance in patients with Bell's palsy (14 female from 18 patients with Bell's palsy). There are insufficient studies concerning young children and infants with Bell's palsy, so the data about causes, treatment and prognosis are poor, in contrast to them concerning adults with Bell's palsy [4,6-,9]. Regarding the treatment of Bell's palsy in adults, one randomized controlled trial revealed that patients treated with prednisolone had better complete recovery rates than those treated with acyclovir [10]. Another study demonstrated that patients treated with a combination of prednisolone and acyclovir had a higher rate of complete recovery compared with those treated with prednisolone alone [11]. However, in a randomized, controlled trial of children 2-6 years of age, no significant differences were found in short-term recovery after treatment with methylprednisolone when compared with an untreated group [12]. In our study, 15 of 18 (83.3%) cases with Bell's palsy recovered completely and there was no significant difference between the treatment modality and recovery rate. In a comparative study of age and degree of facial nerve recovery in Bell's palsy by Danielidis et al., the percentage of complete recovery between age 4 and 50 years varied from 83% to 74.5%, respectively, and the percentage decreased to <54% at age 80 [13]. The same result also can be

found in Peitersen's study [14]: above the age of 60 years, only about one-third of patients will experience the return of normal function. Thus the age of patients is an important factor influencing the final results and children usually have better results than adults.

Considering that we had one patient with NF1 and facial palsy, it is worth to mention that peripheral nerve involvement is a rare neurological complication of NF1. Only one series conducted by Huson et al., half of which were adult patients, has focused on neurological complications of NF1 [15]. More recently, Créange et al. reported 158 patients with NF1 (among them 20 were children) and studied the neurological complications [15]. They found only one child with facial palsy as a complication of NF1. In our study we found one male patient 9 years old with complete right sided facial palsy who was diagnosed with Neurofibromatosis type 1 (NF1).

In conclusion, Facial nerve palsy is a rare condition in children with causes different from those concerning adults [2]. The diagnosis of Bell's palsy in children should be a diagnosis of exclusion and has an excellent prognosis as prednisolone therapy does not produce a significant difference in the outcome of children with Bell's palsy. Further studies concerning children with Bell's palsy should be conducted to improve the knowledge about causes, differential diagnosis and treatment. Our study's limitation is the small number of participants, so it can't lead to any safe conclusion.

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