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Peripheral facial palsy in pediatrics: Clinical characteristics and recovery at one month of follow-up

Silvia Gómez†[1], Magalí A. Torrecillas[1], Bettina Pomerantz[1], Natalia Gadda[1], Antonela Ianniccillo[1], Roxana Espinosa[1], Mariela Pérez[2]

ABSTRACT

Introduction. Peripheral facial paralysis (PFP) is an acute neuropathy of the VII cranial nerve, a frequent reason for pediatric consultation due to its functional, aesthetic, and emotional impact. Children generally have a good prognosis; however, a lack of recovery may require specialized follow-up.

Objective. To describe clinical and epidemiological characteristics and evaluate complete clinical recovery at one month in pediatric patients with peripheral facial paralysis.

Population and methods. Observational, prospective, cohort study conducted in the Moderate Risk Clinic of a general hospital in the Buenos Aires metropolitan area from April 2019 to March 2021. Patients aged 1 month to 14 years with a first episode of PFP were included. Severity was assessed using the House-Brackmann (HB) scale. Primary variable: complete recovery at one month. Secondary variables: clinical and epidemiological characteristics (age, sex, seasonality, laterality, previous symptoms), initial severity, and pharmacological treatment.

Results. Seventy-four patients were included. Median age: 8.5 years (IQR 3-13), 48 females. At one month, 57 patients were evaluated, of whom 40 (70%) had complete recovery. Those with mild initial involvement (HB = 2) recovered completely. No difference in recovery was observed with corticosteroid treatment.

Conclusion. The outcome was favorable for most patients. Less severe initial symptoms were associated with recovery within one month, regardless of the treatment received.

Keywords: *facial paralysis; facial nerve disorders; pediatrics.*

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[1] Moderate Risk Pediatric Clinic; [2] Pediatric Clinic Service; Hospital Nacional Prof. A. Posadas, El Palomar, Argentina.

Correspondence to *Bettina Pomerantz: bepomer@hotmail.com*

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INTRODUCTION

Peripheral facial paralysis (PFP) is an acute neuropathy caused by damage to the VII cranial nerve as it travels from the brainstem to its terminal branches.[1,2] It is characterized by partial or complete loss of facial movement on the affected side. The annual incidence in children varies from 5 to 21 cases per 100 000 inhabitants.[1,3-5] It affects both sexes equally,[6,7] although some authors report a predominance in women.[5,8]

The facial nerve, or VII pair, is a mixed motor and sensory nerve responsible for facial mobility, innervation of the external auditory canal, the tympanic membrane, and the auricle, as well as taste functions in the anterior two-thirds of the tongue.[9] It can be affected centrally or peripherally,[10] congenitally or acquired. Among these forms, the most common in both children and adults is PFP; the idiopathic variant is the most frequent (Bell's palsy).[1,4-6,8] In addition, there are congenital presentations, such as Melkerson-Rosenthal syndrome, and acquired presentations, such as those secondary to infections, trauma, and tumors.[1,3-5,8,9,11]

Clinical manifestations include facial asymmetry, inability to close the eye, blurring of the nasolabial fold, Bell's sign, and, occasionally, hyperacusis, retroauricular pain, and taste disturbances.[1,7,11]

In the pediatric population, there is controversy about the efficacy of corticosteroids and antivirals for its treatment. Some authors suggest that early administration of corticosteroids (within 72 hours) could promote recovery,[6,11] while others argue that antivirals may be more effective, especially in cases associated with herpes zoster.[6]

Most children have a favorable outcome, with complete recovery within 1 to 3 months.[8] However, depending on the initial severity, recovery may take longer. In 15% of cases, neurological sequelae or recurrences may be observed.[3,4,10]

Given the evolutionary spectrum, it is clinically relevant to evaluate early recovery at one month, identify patients at risk for unfavorable outcomes, guide specialized referrals, and plan subsequent follow-up. On the other hand, it is pertinent to describe the evolution under the current diagnostic and therapeutic strategies used in a general hospital.

OBJECTIVE

To describe the clinical and epidemiological characteristics, response to treatment, and evolution at one month in pediatric patients diagnosed with PFP at the Moderate Risk Pediatric Clinic of a general hospital.

POPULATION AND METHODS

A prospective, observational cohort study was conducted in the Moderate Risk Clinic of a general hospital from April 2019 to March 2021.

Patients with the first episode of PFP were included consecutively. Patients who were immunosuppressed, had prior neurological pathology, or had disease recurrences were excluded due to the possibility of different clinical outcomes.

Upon admission, severity was determined using the House-Brackmann (HB) scale, assessing facial symmetry at rest and during voluntary movements (eyebrow elevation, eye closure, smiling, and lip pursing). This scale assigns a score from I (normal) to VI (total paralysis) (*Table 1*). Those who were evaluated within the first 72 hours received 1 mg/kg/day of meprednisone orally for 5 days. If they were already receiving corticosteroids at the time of evaluation, they were instructed to complete the treatment. If more than 72 hours had elapsed at the time of consultation, corticosteroid therapy was not indicated in accordance with current recommendations.[12,13] In all cases, physical therapy and eye care measures (lubricants or artificial tears) were indicated.

Consultations with neurology and/or otolaryngology were performed according to clinical criteria, and the requested complementary tests and their results were recorded. Follow-up appointments were scheduled at 15 days,[1.3] months, and 6 months in cases where clinical recovery was incomplete. The evaluation was performed by the same professional at each successive consultation.

The primary outcome variable was complete clinical recovery 30 days after symptom onset, assessed using the HB scale. Secondary variables included clinical and epidemiological characteristics such as previous symptoms, age, sex, season, laterality, and pharmacological treatment. In addition, we evaluated the relationships among clinical recovery at one month, age, initial severity, and corticosteroid therapy.

Statistical analysis

Continuous variables were summarized using measures of central tendency appropriate to

Table 1. House-Brackmann scale

Grade	Description	Classification
I	Normal, symmetrical facial movement. No obvious weakness, asymmetry, synkinesis obvious weakness, asymmetry, synkinesis (involuntary movements), or contracture.	Normal function
II	Mild asymmetry at rest. Full movement, but less vigorous in the forehead. Slight to moderate mouth movement. Eye completely closed with minimal effort. Absence of obvious synkinesis.	Mild dysfunction
III	Obvious asymmetry at rest. Mild to moderate movement in the forehead. The eye does not close completely. Mild mouth movement. Possible presence of mild synkinesis.	Barely perceptible movement
IV	Marked asymmetry at rest. Barely perceptible movement in the forehead. The eye closes with effort. Noticeable but decreased mouth movement. Evident synkinesis and contractures.	Moderately severe dysfunction
V	Barely perceptible movement in the face. No movement in the forehead. The eye does not close completely. Mouth movement very limited.	Severe
VI	Total absence of facial movement.	Total paralysis

Adapted from House JW, Brackmann DE. Facial nerve grading system. Otolaryngol Head Neck Surg. 1985; 93(2):146-147.

the sample distribution and compared using parametric/nonparametric tests as appropriate. Categorical variables were presented with absolute and relative frequencies and compared using Fisher's exact test and the chi-square test, as shown in the double-entry table. A *p*-value ≤0.05 was considered statistically significant (two-tailed). Epi Info 7.2.4.0 software was used for the analysis.

Ethical considerations

Informed consent was requested from patients aged 13 and 14, and from the parents of patients under 13. Patients aged 7 to 12 years provided assent. The protocol was reviewed by the Teaching and Research Coordination and approved by the Hospital Research Ethics Committee under code 236 LUPOSo/19.

RESULTS

During the study period, 78 patients diagnosed with PFP were evaluated. Four were excluded due to recurrence. Seventy-four cases of first-episode PFP were analyzed; 48 (64.9%) were female; the median age was 8.5 years (IQR 3-13). There was a slight increase in the winter and spring months compared to the summer and fall months. Right-sidedness was affected more frequently (*Table 2*).

In relation to other clinical manifestations present prior to or at the time of the first consultation, 34 patients (45.9%) had no initial symptoms; 15 (20.3%) had facial pain; 12 (16.2%) had upper respiratory tract infection (URTI); 3 (4%) had acute otitis media (AOM); 4 (5.4%) reported recent stress, and 5 (6.7%) had other types of symptoms (*Table 3*). No differences were observed in the evolution of patients with and without previous symptoms. Twenty-two patients (29.7%) had a family history of PFP.

In the initial assessment, according to the HB scale, 29 (39.2%) had a score of II; 44 (59.5%) had a score of III; and 1 (1.4%) had a score of IV.

Fifty-seven patients (77%) attended the one-month follow-up. In this evaluation, 40 (70%) showed complete recovery (HB score = I), while 13 had a score of II and 4 had a score of III. Only 4 of them continued with follow-up and achieved complete recovery at 3 months. According to the severity at the time of the first consultation, those with a score of II recovered completely (n = 19; 100%; 95% CI 82-100), whereas 57% of those with a score of III recovered completely (n = 21; 95% CI 40.8-78.5; $p = 0.0008$).

No differences were observed in age or recovery at one month.

In addition to kinesiology and eye care guidelines given to all patients, 45 (60.8%) received oral corticosteroid treatment, and 1 (1.4%) also received acyclovir. This was a 13-year-old adolescent who had vesicles on the auricle.

Regarding treatment with corticosteroids and complete recovery within 1 month, the results for patients who underwent this treatment (n = 57) are shown in *Figure 1*. According to

Table 2. Baseline characteristics of the study population

Variable		Median	IQR	
Age (years)		8.5	3-13	
		Frequency n = 74	Percentage	95% CI
Gender				
	Female	48	64.9	52.9-75.6
	Male	26	35.1	24.4-47.1
Laterality				
	Right	44	59.5	46.8-70.7
	Left	30	40.5	29.3-53.1
Previous symptoms				
	Yes	40	54.1	42.3-66.2
Time of year				
	Summer	16	21.7	12.9-32.7
	Fall	14	18.9	10.8-29.7
	Winter	22	29.7	19.7-41.5
	Spring	22	29.7	19.7-41.5
House-Brackmann scale				
	2 points	29	39.2	28-51.2
	3 points	44	59.5	47.4-70.7
	4 points*	1	1.4	-*
	5 points	0	0.0	-*
	6 points	0	0.0	-

IQR: interquartile range.
**Not estimable for frequencies <5.*

baseline severity, among patients with a score of II (n = 19), 12 received corticosteroids, and all achieved complete recovery within 1 month. Among those with grade III severity (n = 37), 23 received corticosteroids, and 12 patients achieved complete recovery within 1 month. (52.2%), $p = 0.005$, with a significant difference according to the scale on admission in response to corticosteroids, which was lower in the subgroup with the highest baseline score. The patient who received corticosteroid and acyclovir treatment had a score of III at baseline and made a full recovery after one month.

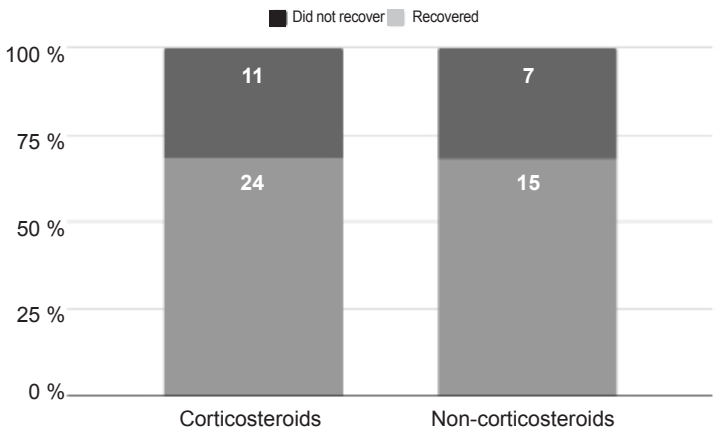
Consultations were performed in 11 cases: 6 with neurology, 3 with otolaryngology, and 2 with both. Four patients required additional studies: 3 neuroimaging (normal report) and 1 patient audiometry.

Table 3. Clinical manifestations present or present at the time of the first consultation

Variable	Frequency n = 74	Percentage (%)	95% CI
Clinical			
No symptoms	34	46	38.7-62.6
Facial pain	15	20.3	13-33.1
URTI	12	16.2	9.9-28.5
AOM	3	4	0.3-9.4
Stress	4	5.4	3.9-16.3
Other	6	8.1	1.9-17
Headache	2	2.7	-*
Headache + *tinnitus*	1	1.3	-
Encephalocranial trauma	1	1.3	-*
Chickenpox	1	1.3	-*
Shingles	1	1.3	

Upper respiratory tract infection (URTI); acute otitis media (AOM).
** Not estimable for frequencies < 5.*

Figure 1. Proportion of patients with complete recovery at one month according to treatment with corticosteroids (n = 56)*



**One patient with one-month follow-up who received corticosteroids plus acyclovir was excluded. p = 0.883 (Chi square).*

DISCUSSION

Most cases of PFP in pediatrics are classified as Bell's palsy due to the lack of a confirmed etiology.[8-10] The relationship between facial paralysis and infections has been reported in various publications. Karalok *et al*. identified AOM as the most common infectious cause.[9] The same authors noted that three patients had associated dental abscesses, leading them to recommend the inclusion of questions about odontogenic pain and dental evaluations when assessing these patients. In the study by Aysel A *et al*., which included 47 patients with idiopathic PFP, 9 (19.1%) had a history of CVAS prior to the onset of paralysis, 2 of whom tested positive for herpes simplex virus type 1 (HSV-1) DNA, and 1 tested positive for *Mycoplasma pneumoniae* IgM serology.[10] In recent years, reports have emerged linking infection by SARS-CoV-2; PFP is one of its possible manifestations.[14] Respiratory symptoms were the most frequent in our study.

The median age of the patients in the series we describe is somewhat lower than that reported in other studies. Çirakli S. reported a median age of 13.1 years,11 while Aysel A. *et al*. describe a mean of 14.7 ± 2.5 years.[10] On the other hand, Ozkale *et al*. identified a higher frequency of cases in patients aged 2 to 6 years and 10 to 14 years.[1] The 2- and 3-year-old group in our series also represents a significant number of cases. A recently published study reported an age similar to ours.[15]

The predominance of right-sidedness has been described in other publications; however, no hypothesis explains this phenomenon.[16] Other studies suggest that both sides of the face may be affected with equal frequency.[17]

The seasonal distribution of PFP has been the subject of previous research, which reports a higher incidence in the winter months, possibly associated with viral reactivation as the etiology of PFP.[18] Even so, its relationship with seasonality remains uncertain, and some studies have reported changes after the COVID-19 pandemic.[19]

The relationship with family history has also been investigated previously; prevalence data ranging from 8.5% to 10.6% have been reported.[10] Other studies report prevalences ranging from 2.4% to 28.6%.[20] This upper limit is similar to that found in our series. The recurrence of paralysis is higher in these patients. Some causes of familial PFP have been proposed, including hereditary anatomical abnormalities (e.g., the common facial canal) and immunogenetic factors.[21] In addition, recurrences associated with other clinical manifestations occur in the context of neurological pathologies such as Melkersson-Rosenthal syndrome or Moebius syndrome.

Regarding recovery, our findings align with other studies that observed no significant differences in recovery rate at one month between treatment groups. Aysel A. *et al*. suggest steroid therapy for all children with idiopathic PFP due to its potential benefits and absence of adverse effects.[10] On the other hand, the study by Yoo HW *et al*. concluded that corticosteroid treatment did not significantly impact recovery.[6]

The benefits of corticosteroids have been

clearly established in adults, but evidence of their efficacy in children remains controversial to date.[6,22]

A clinical trial conducted by Unüvar *et al*., which included 42 patients, and that of Hanci *et al*., which included 113 children, suggested that corticosteroids may accelerate recovery.[23,24] As a result of the lack of evidence in recent years, two double-blind, placebo-controlled clinical trials with larger sample sizes have been initiated, the results of which on the efficacy of corticosteroids are not yet available.[7,25]

In the literature, Ramsay Hunt syndrome has been reported to have a less favorable prognosis than Bell's palsy. However, in our study, we present the case of a patient with Ramsay Hunt syndrome who recovered in 1 month, a shorter recovery period than reported.[9] Our findings indicate that patients who were admitted with a score of 2 on the HB scale showed faster recovery compared to those with more severe paralysis. This observation suggests a possible association between the admission score on the scale and recovery time. A retrospective study conducted in Turkey on prognostic factors in peripheral facial paralysis that included 102 children concluded that HB scale scores of 2 and 3 points at 10 days were associated with early recovery compared to scores of 4 to 6.[26]

One limitation identified in our study was the loss of 23% of patients during follow-up. However, these patients were similar in age, sex, family history, baseline severity score, and corticosteroid treatment, so it is possible that the loss to follow-up did not affect the representativeness of the sample analyzed. This loss can be attributed to the epidemiological context of the period during which the research was conducted, marked by the COVID-19 pandemic.

The sample size and study design do not allow us to completely rule out the benefit of corticosteroids, but the results contribute to the growing body of evidence questioning their usefulness in pediatric practice.

Although this is a single-center study and no additional objective motor function tests were used, the data obtained from this cohort provide valuable information on this pathology in the local context.

CONCLUSION

In this pediatric cohort, PFP showed favorable progression with complete recovery within the first month in a high percentage of patients. Clinical severity at baseline, assessed using the House-Brackmann scale, was significantly associated with recovery at one month, while corticosteroid therapy showed no differences in progression.

These findings reinforce the usefulness of the initial clinical evaluation and the need to follow patients who do not recover within one month, given the possibility of prolonged evolution and/or sequelae. ■

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