Rev Bras Otorrinolaringol.
V.70, n.6, 776-9, nov./dec. 2004

ORIGINAL ARTICLE

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Relation of hyperacusis and peripheral facial paralysis - Bell's palsy

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Key words: facial paralysis (Bell's palsy), hyperacusis.

Summary

Bell's palsy is a unilateral facial paralysis of sudden onset and unknown cause. It may affect salivation, taste and lachrymation depending on the site of facial nerve involvement. Patients can report supersensitive hearing. The stapedius reflex is absent in patients with Bell's palsy. Aim: The objective of the present study was to check if patients with Bell's palsy present hyperacusis. Study design: Clinical prospective. Material and Method: Eighteen patients with peripheral facial paralysis were randomly selected and examined. Complete ENT evaluation was performed, including Hilger facial nerve stimulator, Schirmer's test, electrogustometry, pure tone testing, speech audiometry, immittance testing and discomfort loudness levels. The group aged 31-40 years was the most affected by peripheral facial paralysis in this sample. Results: The incidence was higher in females (61%). The right side of the face was involved in 56% of patients. As to local involvement, grade IV was observed in 44% of cases and grades III and V in 28% of patients each. Only one patient (5.5%) complained of hyperacusis. All studied patients presented reduced tolerance threshold in the audiometric graphs, and stapedius reflex protects these patients by 16dB on average. Conclusion: Therefore, we could conclude that the frequency of complaints of hyperacusis in patients with Bell's palsy was similar to that of the general population; however, in audiometric terms, the tolerance threshold in the paralyzed side was lower when compared with the normal side.

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Article submited on September 14, 2004. Article accepted on November 10, 2004.

INTRODUCTION

Bell's palsy is unilateral facial palsy of sudden onset and unknown cause. This pathology is quite frequent in ENT emergency exactly because it has sudden onset and make patients become very anxious and concerned about the progression of the clinical picture and its cause.

It may be preceded by pain in the pinna region or a situation of stress, anxiety and later distress and depression.

The face has no facial expression on the affected site and facial musculature is deviated to the contralateral side. It may affect salivation, taste and lachrymation, depending on the topography of the facial nerve affection. Patients may refer auditory hypersensitivity [1], the symptom which was studied in the present report.

In patients with Bell's palsy, stapedial reflex may be absent. Perlman (1938)[2] & Tschiassny (1994)[3] reported cases of patients with Bell's palsy who reported hearing loss and they agreed that the cause of hearing loss in these patients could have been the absence of stapedial reflex. The reflex is derived from bilateral contraction of stapedial muscle in the middle ear, in response to loud sounds, which occurs at about 85dB HL.

Hyperacusis is defined as hypersensitivity to common everyday sounds, perceived as unbearable, strong or painful (Schwade, 1985)[4], (Sammeth, Preves & Branby, 1997)[5].

Marriage & Barnes (1995)[6] classified hyperacusis as peripheral or central. Peripheral hyperacusis occurs when stapedial reflex is absent and sound is perceived as louder. Central hyperacusis is specific sound hypersensitivity, not necessarily of loud sounds, resulting from serotonin dysfunction.

Sahley, Nodar & Musick (1997)[7] reinforced that suppression and reduction of amplitude of nervous action potential is the best way to document activation of medial efferent fibers.

Efferent pathway could be involved in the explanation of hyperacusis, given that the auditory protection mechanism against loud sounds, for this reason, would be deactivated and sound waves that reached the inner ear would be somewhat amplified towards the brain.

The purpose of the present study was to check whether patients with Bell's palsy had hyperacusis or not.

MATERIAL AND METHOD

We examined 18 random patients who presented peripheral Bell's palsy and came to the ambulatory of Facial Palsy, Service of Otorhinolaryngology, Hospital Sao Paulo – Escola Paulista de Medicina.

In order to classify the patients, we followed the criteria below:

1. Exclusion of possible factors that could cause palsy
2. Duration of palsy equal or less than one week
3. Absence of middle ear disorders
4. Patient had not been clinically treated yet

We conducted complete ENT examination, Hilger's test, Schirmer's test, electrogustometry, pure tone audiometry and speech discrimination, immittanciometry, and hearing discomfort thresholds with audiometer Maico MA-41, classifying palsy's grade according to House (1993) and applying the protocol to study research data. All patients were assessed by the same physician and the same audiologist.

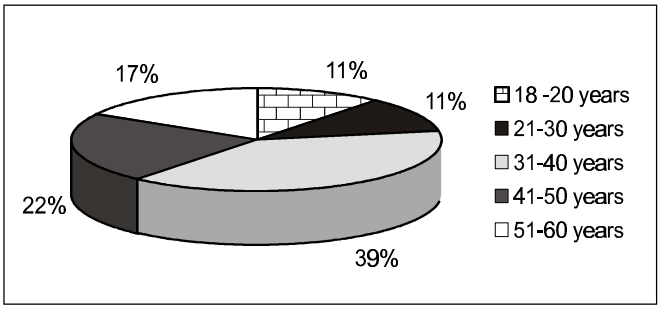
All patients were treated with regressive doses of prednisone.

We considered hyperacusis as hypersensitivity to everyday common sounds perceived by patients as unbearable, strong and painful.

RESULTS

Findings in the present study evidenced that:

- Age of patients ranged from 18 to 60 years; the most affected age range was 31 to 40 years (Graph 1).
- Female subjects were more affected by peripheral facial palsy, reaching 61% of the cases (Graph 2).
- Right hemiface was affected in 56% of the cases, with no relevance for prognosis (Graph 3).
- The most frequent grade of palsy, according to House classification, was grade IV in 44% of the cases and grades III and V in 28% of the cases each.
- Hyperacusis was present in only one patient, which amounted to 5.5% of the cases.
- All patients presented reduction of loudness tolerance thresholds measured by the audiometer, and the stapedial reflex protected them by 16dB on average (Table 1).



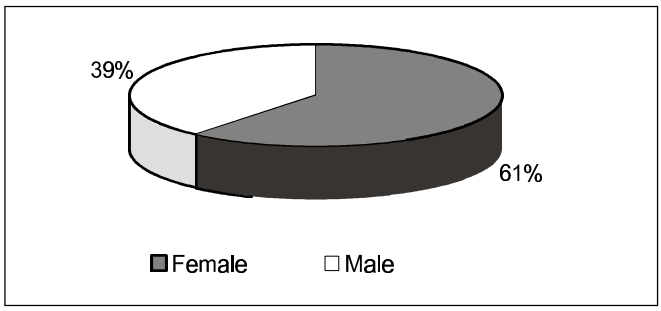
Graph 1. Patients (n= 18) with peripheral Bell's palsy assessed for presence of hyperacusis in relation to age.

DISCUSSION

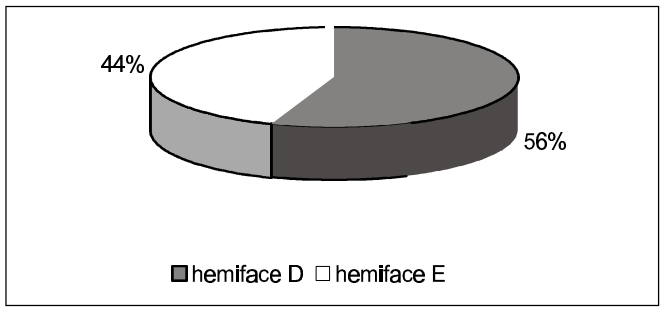
Peripheral Bell's palsy is one of the most frequent causes and, according to publications, its incidence ranges from 11 to 12.8 new cases per 100,000 inhabitants[8].

It may be attributed to a vascular cause, but clinical, experimental and epidemiological arguments suggest that it is polyneuritis caused by herpes virus simplex that affects the facial nerve[9].

Clinically, it has sudden onset with progression within few hours with the following signals: facial or pharyngeal pain, retroauricular pain and



Graph 2. Patients (n= 18) with peripheral Bell's palsy assessed for presence of hyperacusis in relation to gender.



Graph 3. Frequency of affected side in patients with peripheral facial palsy.

Table 1. Loudness discomfort thresholds in affected and normal ears and the means (in frequencies of 500/1K/2K/4K).

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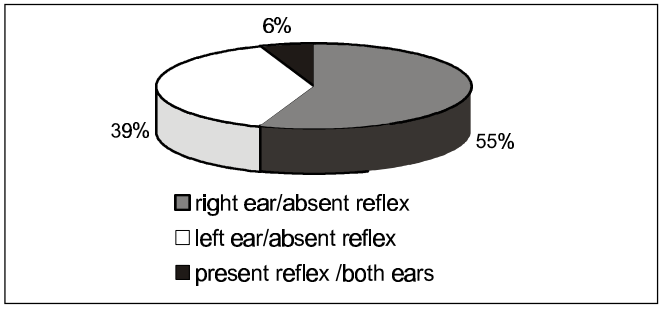
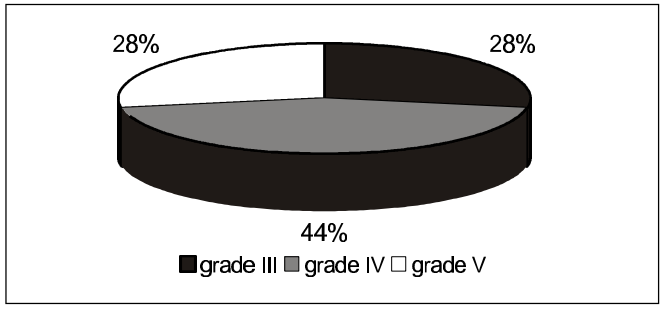
NORMAL EAR					
Frequency/ Ear	500	1K	2K	4K	Média
LE	100	120	120	120	**115**
LE	100	120	120	120	**115**
LE	95	100	100	100	**99**
RE	100	115	115	105	**109**
RE	100	120	120	120	**115**
LE	110	100	100	100	**103**
RE	110	120	120	120	**118**
RE	100	120	120	120	**115**
LE	100	110	110	120	**110**
RE	100	120	120	120	**115**
LE	100	110	120	120	**113**
RE	100	120	120	120	**115**
LE	100	120	120	120	**115**
LE	90	100	105	110	**101**
RE	110	120	120	120	**118**
LE	100	120	120	120	**115**
LE	100	100	110	120	**108**
Mean	101	114	115	116	112

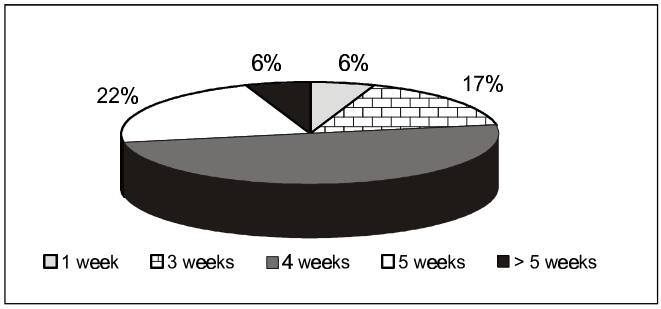
AFFECTED EAR					
Frequency/ Ear	500	1K	2K	4K	Mean
RE	90	100	100	100	**98**
RE	80	85	90	95	**88**
RE	95	100	100	100	**99**
LE	90	100	115	100	**101**
LE	85	90	90	85	**88**
RE	80	85	90	90	**86**
LE	90	95	100	95	**95**
LE	90	95	90	90	**91**
RE	90	95	100	115	**100**
LE	95	105	95	100	**99**
RE	90	90	95	85	**90**
LE	90	100	110	100	**100**
RE	100	105	95	110	**103**
RE	100	100	95	110	**101**
LE	100	120	120	120	**115**
RE	85	90	90	85	**88**
RE	80	90	100	100	**93**
Mean	90	97	99	99	96



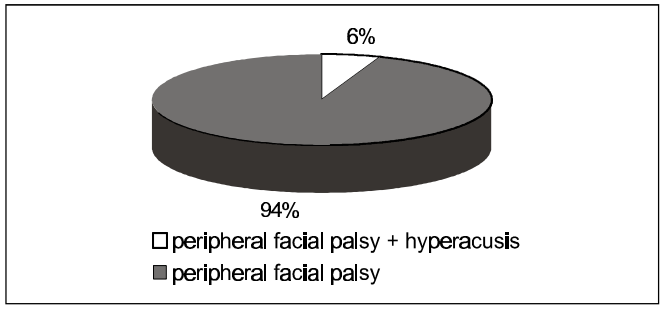
Graph 4: Correlation between absence of stapedial reflex and patients with Bell's palsy.



Graph 5. Frequency of palsy grade * (1st visit), according to the classification by House.



Graph 6. Time of return of stapedial reflex after onset of peripheral facial palsy.



Graph 7. Frequency of hyperacusis in patients with peripheral Bell's palsy.

changes to the taste sensation in the affected hemitongue.

As to hyperacusis complaint, only one patient (5.5%) referred complaint of auditory discomfort, which did not differ from the complaints referred by the general population. Therefore, stapedial muscle palsy did not influence in the onset of these manifestations.

Comparing the hearing discomfort threshold on the paralyzed side in relation to the normal side, we noticed that there was reduction of discomfort thresholds in the paralyzed side. Therefore, there was contradiction between patients' complaint and the audiometric finding. Possibly it was due to the fact that reduction of discomfort level is not enough to cause clinical manifestations of hyperacusis.

CONCLUSION

Patients with Bell's palsy clinically presented complaints of hyperacusis similar to those of the general population, but audiologically, loudness tolerance threshold on the paralyzed side was lower than on the normal side.

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