

Incidence of Hyperacusis in Pediatrics Facial Paralysis

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ABSTRACT:

Background:

Facial nerve is motor in nature and it supplied facial muscles as well as ear muscle named stapedius, any lesion throughout in the pathway from brain to muscle can cause difficulty in production of expression, dribbling of saliva, difficulty in closure of eyes and also hyperacusis. Sensory supply to tongue is also affected and can cause loss of taste sensation.

Objective: To enlightens the importance of one of the symptom of facial paralysis that is hyperacusis.

Methodology: A non randomized, single center hospital based observational study design was conducted with sample of 50 patients with diagnosis of facial paralysis, under the age 18 years at Department of physiotherapy and neurology, Children hospital and Institute of Child health (CH & ICH) Lahore from December 2011 to February 2012.

Results: It is showed in results that 78% patient had problem of hyperacusis, about 54% patient presented with dropping of eyelid, 42% had taste sensation lost, 88% had problem of dribbling of saliva, 34% presented with twitching of face and 90% showed problem in smiling.

Conclusion: Hyperacusis is present in patients of facial palsy so it is necessary to have keen observation for these symptoms also so we can treat these symptoms along with others.

Keywords: Hyperacusis, Facial Paralysis, Stapedius. (JRCRS 2014; 2(1): 37-39)

INTRODUCTION:

Facial nerve palsy is neural disorder in which damaged nerves due to any trauma to skull or infection cause the disturbance of facial muscles.¹ This nerve is mainly motor in function and along with its motor supply to facial muscle it supplies the stapedius, muscle of internal ear. This is the reason why people with complete lesion of facial nerve has problem in hearing on effected side.²

Patients of facial palsy presented with muscular weakness of facial muscles as their face draws towards unaffected side while smiling as the unaffected side was strong as compared to effected side due to which face draws towards unaffected side. Patients were also unable to close their eyes and unable to produce facial expressions.

In complete lesion of nerve the motor as well as sensory supply of facial nerve was affected and patient can't bear high pitched voices and noise. ³ The dropping of saliva and disarthria can

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cause psychological problems among patients. 4 Facial palsy could be either due to upper motor neuron lesion or lower motor neuron lesion, both have different symptoms. In lower motor neuron lesion patient was unable to form wrinkles on his forehead, drooping of saliva is seen on same side in those patients. While in upper motor neuron lesion the forehead was not effected due to alternative pathway⁵. There were many causes for paralysis of facial nerve as tumors, Guillain Barre syndrome, cerebrovascular accidents, otitis media, birth injuries like trauma by forcep delivery etc.⁶

As facial nerve supplies the stapedius muscle of ear, so the damage to facial nerve also disturbs the supply of this muscle so the patient becomes very much sensitive to noise and even to normal sounds, as they perceived these normal voices as intense high pitched voices.⁸ This is known as hyperacusis.

Hyperacusis is divided in two types peripheral and central. In peripheral hyperacusis sound perceived louder as the stapedius reflex is absent and in central hyperacusis hypersensitivity is produced towards specific sound due to abnormal function of serotonin.⁹

A survey report of Europe said that incidence of facial palsy ranges from 40 to 240 patients per 100,000 subjects¹⁰. Another statistical analysis of America says that 40,000 people face this problem annually in United States. 0.02% of people effected worldwide.¹¹

A report from Israel showed that 33.65% of patients on average showed hyperacusis due to facial palsy.¹²

Ho Yun Lee, Eun Woong Ryu, Soo Wan Park, Su Jin Kim, Seung Geun Yeo and Moon Suh Park had studied the different symptoms of facial palsy which comes with time. Yetiser, Sertac, Fout, Kazkayas and Mustafa said that otitis media causes facial palsy

Selesnick, Samuel H.; Lynn-Macrae, Alastair G said that surgeons should be careful while doing surgery near the facial nerve as in case of acoustic neuroma resection, as during surgery lesion of facial nerve causes all the symptoms. Odebo, Timothy Olugbenga Mache; Ologe, Foluwasayo E. said that lower motor neuron type of facial palsy is more common.

Early diagnosis, proper treatment, physiotherapy and strengthening exercise are helpful in the cure of facial palsy.

MATERIAL AND METHODS:

A cross sectional survey was conducted at Department of physiotherapy and neurology, Children hospital and Institute of Child health (CH& ICH) Lahore from December 2011 to February 2012. Inclusion Criteria: All patients less than 18 years of age. All patients diagnosed with facial palsy. Exclusion Criteria: All patients with chronic illness. Diagnosis can be made on physical and clinical examination following are some methods to diagnose. Physical examination will help to determine whether the nerve damage is (central) or close to ear (peripheral). Ask the patient to lift her or his eyebrows to assess whether the lesion is upper motor neuron or lower motor neuron also differentiate between paralysis and paresis.¹³ Nerve Excitability Test: Facial nerve excitability test gives us information about the extent of damage. Sometimes this test shows normal result in spite of damage this is the sign of better outlook for return to previous level of function.¹⁴ Electroneurography (ENoG): In this method we see the response of muscles, which are supplied by facial nerve, when nerve is stimulated electrically. Stimulation is given by small electrodes placed on face and response is recorded by computer.¹⁵ Hearing Test (stapedius reflex): It is used to check the involvement of hearing due to facial nerve lesion.¹⁶ Electromyography: It is used to check the recovery process of muscles. In

this electromyography may be indicated in cases of long standing paralysis. This test helps us to know if the nerve and muscles are recovering. Tiny needles are used to measure the responses. (17) Data Analysis Procedure: Using Statistical Package for the Social Sciences (SPSS) v.17 the data was managed and analyzed. The continuous variables expressed as mean $\pm$ S.D. where as qualitative variables expressed in the form of frequency table and percentages.

RESULTS:

It is showed in results that 78% patient had problem of hyperacusis, about 54% patient presented with dropping of eyelid, 42% had taste sensation lost, 88% had problem of dribbling of saliva, 34% presented with twitching of face and 90% showed problem in smiling.

DISCUSSION:

The purpose of this study is to observe the prevalence of one of the symptom's of facial paralysis that is hyperacusis. This symptom usually occurs on the same side that of facial palsy. This study proves that if there is any lesion in the fibers of facial nerve supplying stapedius can alter auditory acuity on the affected side. It also proves that facial nerve has a close association with the 8th cranial nerve that allows us to hear, so paralysis to facial nerve may affects it which becomes a major reason in hyperacusis.

Out of 50 patients 56% had positive family history of facial palsy and 32% had showed previous history of the same disease which showed that the disease could reoccur. These variables were shown by frequency tables. On history taken 56% patients had show involvement of right side and 44% had left side facial palsy. On examination about 78% patient had problem of hyperacusis, about 54% patient presented with dropping of eyelid, 42% had taste sensation lost, 88% had problem of dribbling of saliva, 34% presented with twitching of face and 90% showed problem in smiling. These variables were shown on table and also by a multiple bar chart. On history taken 40% patient had right side hyperacusis and 38% had left side involved. On observation and on questioning from the patient it was noticed that the side of hyperacusis was same. Other symptoms such as eyelid drooping, dribbling of saliva, loss of taste sensation, loss of wrinkles on forehead and deviation of angle of mouth is also of great importance and can be helpful in early diagnosis and they should be manage on time.

Many studies show that the symptoms of facial paralysis plays a great role in its diagnosis and the problem of hyperacusis is common in facial palsy. (20) Some studies also shows that sometimes even the ear infections may become the reason of facial paralysis. (12)

As the problem of hyperacusis is not only because of facial paralysis there are number of reasons behind this problem so researcher recommend that there should be some research done on this problem and also enlightens the importance of hyperacusis treatment.

CONCLUSIONS:

According to the review of literature and on history bases following conclusion has made:

Hyperacusis is also one of the common symptoms of facial palsy.

Hyperacusis is of same side as of the side of facial palsy.

Like other symptoms Hyperacusis should also managed earlier. But the severity of this symptom is very less in patients.

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TABLES

Table 1: Distribution of cases, according to age and family history of facial palsy

Factors		Values
AGE	MEAN $\pm$ SD	10.7 $\pm$ 3.24
Socioeconomic status	Upper	6%
Family history of facial palsy	Middle	70%
	Lower	24%
	Yes	44%
	No	56%

Table 2: Percentages of different symptoms of facial paralysis

Sr. #	Variables	Frequency %ages
1	Hyperacusis	78%
2	Dropping of eye lid	54%
3	Dribbling of saliva	88%
4	Taste sensation lost	42%
5	Problem of smiling	90%
6	Twitching of face	34%

The patients with facial palsy have high rate of dribbling of saliva on the effected side and hyperacusis is another major problem.