A Prospective Study of Physical Therapy in Facial Nerve Paralysis: Experience at a Multispeciality Hospital of Kashmir

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ABSTRACT

BACKGROUND: Bell's palsy is an acute weakness of seventh cranial nerve leading to loss of movement on one side of the face. It usually recovers of its own without treatment in most of the patients but not all. Physical therapy in the form of electrotherapy, massage and facial exercises is used as adjuvant to hasten recovery.

OBJECTIVES: To analyze the role of physiotherapy in the form of electrotherapy in patients with peripheral facial paralysis attending multispecialty hospital in Kashmir.

METHODS: A prospective study was carried out on 50 patients of facial nerve paralysis attending OPD between Jan 2009 and Jan 2010. All of the patients were subjected to medical treatment. The patients were put to Physical Therapy in the form of electrotherapy followed by facial exercises. All patients received electrotherapy to the paralyzed facial muscles for a period of 2 weeks but some were given extended doses for 4 weeks. 20 patients presented for the treatment in the first week, 12 in second week and 18 presented after three weeks or later.

RESULTS: Fifty patients (30 female, 20 male) of facial nerve paralysis were included. Time span between medical diagnosis and physical therapy was from 1 week to 4 weeks. Patients were assessed at 4 weeks, 2 months and 6 months after the treatment. Out of 20 patients who presented in 1st week and received steroids and electrotherapy 19(95%) had fully recovered except for one case that was irregular for treatment. Out of 12 Patients who presented in 2nd week of illness, 8(66.6%) patients had full recovery and partial recovery in rest of 4 (33.4%) patients. Eighteen patients (100%) who presented in third week onwards of illness had partial recovery.

CONCLUSION: Physiotherapy in the form of electrotherapy and facial exercises has a effective role in the early management of peripheral facial paralysis. JMS 2012;15(2):145-48

Key words: Electrotherapy, paralysis, physiotherapy, prospective

Bell's palsy is an acute weakness of seventh cranial nerve leading to loss of movement on one side of the face. Idiopathic facial palsy, also called Bell's palsy, which may begin with symptoms of pain in the mastoid region and produce full or partial paralysis of movement of one side of the face.^{1,2}

The annual incidence of Bell's palsy varies widely, ranging between 11.5 and 40.2 cases per 100,000 populations.^{3,4} There are peaks of incidence in the 30 to 50 and 60 to 70 year old age groups.^{5,6} Bell's palsy has a fair prognosis without treatment⁷ and it usually recovers of its own without treatment in most of the patients but not all. Traumatic seventh cranial nerve palsy resulting from either trauma of head or surgical excision of tumors forms another form of facial palsy sometimes to the extent of 5.04%.⁸

The prognosis depends to a great extent on the time at which recovery begins. Early recovery gives a good prognosis and late recovery a bad prognosis. If recovery begins within one week, 88% obtain full recovery, within one to two weeks

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83% and within two to three weeks 61%. Normal taste, stapedius reflex and tearing give a significantly better prognosis than if these functions are impaired. Recovery is less likely to be satisfactory with complete rather than incomplete paralysis, with pain behind the ear and in older people.⁹ Other poor prognostic factors include hypertension and diabetes mellitus.^{4,5} Physical therapy in the form of electrotherapy, massage and facial exercises are used as adjuvant to hasten recovery. Very few trials are available to decide whether any of these modalities work. So more and more trials are needed to assess their effect for the benefit of patients.

About 23% of people with Bell's palsy are left with moderate to severe symptoms, hemifacial spasm, partial motor recovery, crocodile tears (tears upon salivation), contracture or synkinesis (involuntary twitching of the face or blinking). Recurrence occurs in about 8.3%.²

Facial nerve paralysis occurs due to interruption at any of the facial nerve level and may result in complete or partial paralysis of facial muscles resulting in salivation, tearing disorders, hyperacusia and hypoesthesia of external auditory canal. The etiology in 50% of patients is idiopathic also called as Bell's palsy. Other causes can be trauma, high blood pressure, diabetes mellitus, pregnancy, viruses.

The recovery of facial nerve palsy depends on patients age, lesion involved, physical therapy instituted. Facial nerve recovery may take weeks to years. Facial nerve palsy requires medical and physiotherapeutic approach. Physical therapy is paramount, with the main goal of reestablishing muscle trophism, function and strength. Role of physiotherapy in the form of physical therapy is electrotherapy, massage (facial exercises), kinesiotherapy is supported by the literature.

Thermal methods, massage, facial exercises, electrotherapy (which uses an electrical current to cause a single muscle or group of muscles to contract) biofeedback are forms of physical therapy that have been used.^{4,10} Exercise therapy has been used more than other interventions.¹¹⁻¹⁴

The aim of present investigation was to describe and to analyze physiotherapy results in a prospective study on peripheral facial paralysis patients enrolled in department of physical medicine and rehabilitation (PMR) in Sher-i-Kashmir Institute of Medical Sciences, a multispecialty tertiary care centre, Srinagar.

Methods

A prospective study was carried out on 50 patients of facial nerve paralysis who attended the out-patients Department between Jan 2009 and Jan 2010. Patients were enrolled in the department of Physical Medicine & Rehabilitation (PMR) who were referred from departments of General Medicine, Neurology of Sher-i-Kashmir Institute of Medical Sciences (SKIMS) Kashmir, India. All of the patients were subjected to medical treatment. Moreover, the patients were

put to physical therapy in the form of electrotherapy followed by facial exercises. We analyzed 50 patients as to their age, gender, etiology, time duration between diagnosis and treatment time, number of sessions and resources utilized. All patients received electrotherapy to the paralyzed facial muscles for a period of two weeks but some were given extended treatment for four weeks. Twenty(40%) patients presented for the treatment in first week, 12(24%) in second week and 18(37%) in third or more than three weeks time. All the patients who presented at first week were given medical treatment; however, even at late presentations after second week, twelve patients were also put on medical treatment.

Results

Fifty patients of facial nerve paralysis were included in this prospective study in the present study. There were 30 female patients (60%) and 20 were male (40%). The range of age for the patients enrolled was between 16 and 55 (Table 1). Among all the patients 22 (44%) had type 2 diabetes mellitus, 24 (48%) had hypertension, 12 (24%) had hypothyroidism, 5(10%) were traumatic (because of tumour excision) and 35(70%) patients were idiopathic. There were 49(98%) patients of unilateral facial paralysis. Right Facial paralysis was seen in 35 (70%) and left side in 15 (30%).

TABLE I. Characteristics of patients with bell's palsy

Gender	No. of Patients	Age Range	Time of presentation		
			1 week	2 week	>2 week
Male	20(40%)	18-50	7	4	6
Female	30(60%)	16-55	13	8	12
Total	50(100%)	16-55	20	12	18

Out of 50 patients 35 (70%) patients had complete paralysis and 15(30%) had incomplete facial palsy.

Time span between medical diagnosis and physical therapy was from one week to four weeks. Patients were assessed at 4 weeks, 2 months and 6 months after the treatment. Out of 20 patients who presented in 1st week and received steroids and electrotherapy had fully recovered except for one case that was non-compliant for treatment. Out of twelve patients, eight patients who presented in second week of illness had full recovery while as partial recovery was observed in rest of 4 patients. Eighteen patients who presented in third week onwards of illness had partial recovery. The status of the recovery observed in patients with Bell's palsy treated with electrostimulation was highly significant in those who presented in first week as compared to second and third week ($p=0.0001$) (Table 2).

Discussion

The prognosis of facial paralysis depends to a great

TABLE 2. Treatment modalities of bell's palsy patient: Fisher's 2 tailed exact test

Presentation	No. of patients	Full recovery	No /partial recovery	P value
1st week	20	19(95%)	1(05%)	<0.0001
2nd week	12	8(66%)	4(34%)	
3rd week	18	0	18(100%)	

extent on the time at which recovery begins. Early recovery gives a good prognosis and late recovery a bad prognosis. If recovery begins within one week, 88% of the patients attain full recovery, while recovery within one to two weeks 83% and within two to three weeks 61% attain full recovery. Normal taste, stapedius reflex and tearing give a significantly better prognosis than if these functions are impaired. Recovery is less likely to be satisfactory with complete rather than incomplete paralysis, with pain behind the ear and in older people.⁹ Other poor prognostic factors include hypertension and diabetes mellitus.^{4,5} This is our first attempt to report the prospective study of patients with facial nerve paralysis treated with electrotherapy (which uses an electrical current to cause a single muscle or group of muscles to contract) from Kashmir region (North India). In our study the cause and frequency of facial nerve paralysis are coinciding with Brazilian literature. Mosforth¹⁰ studied the efficacy of electrotherapy after six months in a total of 86 participants (n = 44 electrical stimulation and n = 42 control). The graphs constructed by the authors using an intention- to-treat analysis and less than 75% recovery was considered a bad outcome. The relative rate of improvement was not significantly different, however, relative risk (RR) 1.30, 95% CI 0.68 to 2.5 was reported. Manikandan¹⁵ described results of a study where in individualized facial neuromuscular re-education (physical exercises) has been reported to be more effective in improving facial symmetry in patients with Bell's palsy than conventional therapeutic measures alone. As per Nakamura *et al*¹⁶ frequency of facial Nerve palsy varies from 62-93%. The Facial Grade Score measured rest score, synkinesis scores and movement score of the 28 participants in each group. The first two scores did not show statistical significance. The movement score improved significantly in the group without electrical stimulation, mean difference (MD) 68.00, 95% CI 59.93 to 76.07 was reported. Consequently the total score improved, MD 12.00, 95% CI 1.26 to 22.74.

Vasconcelo's¹⁷ study showed higher rate of traumatic Facial palsy as compared to idiopathic facial palsy but in our study we observed the reverse trend with traumatic palsy as 10% and idiopathic accounted for 70% cases. In our report, hypertension and diabetes accounted for majority of facial nerve paralysis cases. When etiology was compared to motor recovery, we noticed total recoveries in the cases of angiogenic etiology (60%). In a study Wolf¹⁸ reported 140 patient of angiogenic facial paralysis with satisfactory recovery in 82.1% of patients. Most of the patients attain recovery in first few weeks but when there is denervation

after 10 days there is delayed recovery onset.

In contrast Riberio¹⁹ found an average time for facial nerve recovery between fifteen days to four years. Using physical therapy, Cohen²⁰ found in 95 pregnant females, complete recovery within four months in 56(58.9%) patients. Gomez-Bentz²¹ using physical therapy in 36 patients, partial recovery was found in 83.3% of patients after 15 days and total recovery in 63.8% after 1 month.

In accordance with study of Cronin and Steenerson²² biofeed back by surface electromyography results revealed improvement in facial symmetry. The main physical therapy resources employed in patients were kinesiotherapy, cryotherapy and electrotherapy. Further, a study conducted by Flores²³ coincides with our report depicting fast and complete recovery in Bell's palsy patients treated by electro stimulation.

In conclusion, the present study revealed patients had early and effective improvement by use of electrotherapy and facial exercises, however, more studies are needed to confirm the role of physical therapy in addition to medical therapy for early recovery of patients of facial palsy.

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