



Emotional training of facial nerve palsy: a preliminary report

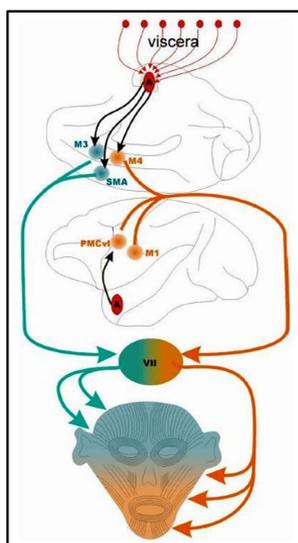
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INTRODUCTION

The muscles of facial expressions rearrange the configuration of the facial features to express emotions, but facial expressions can be produced even in the absence of emotion. Differently from limb muscles, **facial muscles motoneurons** can be recruited by **two descending motor pathways: one arising from the primary motor cortex and the second arising from the midcingulate area** [1].

Lesions involving the former pathway are associated to voluntary facial paresis, while lesions involving the latter (the “limbic” pathway) are associated to emotional paresis [2].



Patients suffering a voluntary facial paresis cannot voluntarily smile, but for example they smile normally in response to jokes. On the contrary, patients suffering an emotional paresis can voluntarily mimic facial expressions, but are unable to produce spontaneous emotional expressions (amimia). During rehabilitation after facial nerve lesion, patients are commonly trained to produce symmetric and isolated voluntary movements (i. e., neuromuscular retraining [3]).

In this current work we used emotional activation to train facial muscles after a peripheral facial nerve palsy, according to the hypothesis that midcingulate area, in addition to the primary motor cortex, can participate to the motor recovery after facial nerve lesion.

AIM

This study sets out to determine whether **an emotional training influences the functional outcome** of patients after facial nerve palsy.

MATERIALS AND METHOD

The House-Brackmann scale (HBS) was used to evaluate facial symmetry and synkinesis, both before and after the rehabilitation program. This system measures the global degree of paresis/paralysis. It is the most used and is simple to administrate [4]

Ten patients (36-76 years; 4 females) suffering a facial nerve lesion (6 Bell’s palsy, 2 Ramsay Hunt syndrome, 2 post-surgery palsy) underwent up to 20 physiotherapy sessions. Demographic and clinical data are collected in Table 1. Each session (45 minutes long) was led by a licensed physiotherapist. Consecutive sessions were kept at least 3 days apart. The emotional activation of the paretic facial muscles was obtained by asking patients to recall pleasant memories. Patients were guided by the therapist in increasing their awareness of the emotion-evoked movement by concentrating on kinesthesia.

RESULTS

On average, patients started the rehabilitation 80 days after the nerve lesion. At the beginning of the rehabilitation program, patients suffered a moderate facial asymmetry according to the HBS (median HBS score: 3.5; IQR: 3). At the end of the rehabilitation program, HBS score median was reduced to 1 (IQR: 1), indicating a more symmetric face and less severe synkinesis (**Wilcoxon test, p = 0.002**). **All patients improved their HBS.**

DISCUSSION

Emotional training, a form of repetitive task-specific training, **seems beneficial for people receiving rehabilitation following facial nerve lesion in regaining facial symmetry, in reducing the severity of paresis and in controlling synkinesis.** The neural network mediating the emotional training effects could include structures of the limbic system such as the amygdala which are known to project to the facial muscle motoneurons via the midcingulate area [1].

Complete recovery in less severe paresis could be due not only to physical therapy but also to spontaneous recovery of neuropraxis.

In order to support this hypothesis are necessary electromyography and electroneurography data.

CONCLUSIONS

Emotional training of facial muscles led by a physiotherapist is a promising tool for rehabilitation after a facial nerve lesion.

REFERENCES

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TABLE 1

Patient	Age	Sex	Side	Pathology	HBS before	HBS after
1	65	M	Left	Bell	5	2
2	36	M	Left	Bell	5	1
3	63	M	Left	Bell	2	1
4	61	F	Right	Bell	2	1
5	49	M	Left	Bell	2	1
6	61	M	Right	Bell	5	2
7	63	F	Left	Ramsay Hunt	6	4
8	76	F	Right	Ramsay Hunt	4	2
9	41	F	Right	Surgery	2	1
10	61	M	Left	Surgery	3	1

