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## **The clinical study of post-stroke depression of heart and spleen deficiency treated with music electro-acupuncture**

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**Abstract. Objective:** To observe the therapeutic effects of post stroke depression of heart-spleen deficiency with the method of music electro-acupuncture in order to find a safe and effective treatment. **Methods:** 90 patients randomly divided into acupuncture group treated with twist reinforcing method, electro-acupuncture group (EA group) treated with electro-acupuncture method, music electro-acupuncture group (music EA group) treated with electro-acupuncture method and listen to antidepressant music. Using HAMD, MESSS, WHOQOL-BREF to estimate the effect of three methods before and after treatment. **Results:** 1. Compared with acupuncture group and EA group, music EA group is better in improving depressive symptoms ( $P < 0.01$ ). 2. Compared with acupuncture group and EA group, music EA group is better in improving nerve function ( $P < 0.01$ ). 3. Compared with acupuncture group and EA group, music EA group is better in G1G4 physical field psychological field ( $P < 0.01$ ). 4. Total efficiency of HAMD and MESSS of music EA group is better than the other two groups ( $P < 0.05$ ). **Conclusions:** 1. The music EA therapy is superior to the other two groups in the fields of improving the depressive symptoms, restoring from the deficit neural function and improving the quality of the patients' lives. 2. The music EA therapy can comprehensively ameliorate the Depressive symptoms of the stroke depressive patients by improving the patient's physical and psychological condition.

**Key words:** Post stroke depression (PSD), Music electro-acupuncture, Heart-spleen deficiency, Quality of life

### **Introduction:**

Depression after stroke (PSD) often appears cardinal syndroms such as low spirit, flagging interests, sleep disorder, which not only influence mood of patients, but also obstruct to rehabilitation of neurological function impairment. Because of side reactions, no quick results in early treatment and palindromia after drug withdrawing, the application of Western medicine is currently restricted. In this study, we observe the effect of 90 patients of PSD through three intervene therapies such as the acupuncture, electro-acupuncture, music electro-acupuncture to explore a safe and effective new approach.

### **Materials and methods:**

#### 1. General information

90 observed cases all came from the Second Affiliated Hospital of Heilongjiang University of Chinese Medicine from Jan, 2012 to Jun, 2012. These observed cases were randomly divided into acupuncture group, EA group and music EA group by PEMS3.1 software ( $n=30$ ), including 51 male

patients, 39 female patients, 75 cerebral infarction patients, 15 cerebral hemorrhage patients, whose ages are between 32 and 75 years old, the course of disease is during 1-4.5 months. There were no significant differences among duration of diseases, ages, sex, types of diseases ( $P > 0.05$ ).

## 2. Diagnostic Criteria

2.1 Diagnostic criteria of stroke Modern medical diagnostic criterion-referenced 1995 Fourth National Conference on Cerebrovascular Disease diagnostic criteria established by stroke, TCM diagnostic criteria reference to the State Administration of Traditional acute encephalopathy group drafting a research collaboration of the "stroke diagnosis evaluation standards" (Trial) 1995 requirements.

2.2 Diagnostic criteria of depression Modern medical diagnostic criteria refers to "Chinese Classification and diagnostic criteria of mental disorders 3rd edition" (CCMD-3) to develop diagnostic criteria of depression, People's Republic of TCM diagnostic criterion-referenced standards GB/T16751.2-1997 "TCM clinical diagnostic criteria."

2.3 TCM diagnostic criteria of diagnosis Heart and spleen deficiency type refers to the "depressive classification criteria" in the "TCM Syndrome Diagnostic efficacy standards" which belongs to the "People's Republic of pharmaceutical industry standards".

3. Inclusive criteria: ① Patients was confirmed of stroke according to the diagnostic criteria and verified by head CT or MRI; ② Scores of HAMD  $\geq 7$  and  $\leq 24$ ; ③ Patients who are conscious, non-aphasic, without mental retardation, without symptoms of mental illness and can understand the content of scale and cooperate; ④ Age between 30 and 75, any gender; ⑤ Secondary to acute cerebral apoplexy (2 weeks), the course of the disease are within half a year; ⑥ Obtain informed consent from patients and their families.

4. Exclusive criteria: ① Patients was not confirmed of stroke according to the diagnostic criteria and inclusive criteria; ② Patients who suffered heart, liver and kidney failure or had ulcers on the bodies leading to failure to acupuncture; patients who were fainting during acupuncture treatment; ③ Scores of HAMD  $> 24$ ; ④ Patients who had disturbance of consciousness or communicative disorders; ⑤ Before the onset of stroke have a history of depression or mental illness; ⑥ Using antidepressants within 2 weeks; ⑦ Having medical history like dementia or Parkinson's disease which could impact the scores of depression.

5. Removal and shedding standards: Do not follow doctor's orders to take medicine and acupuncture which could influence assessment of scale's scores. Patients quit for personal reasons; lost to investigate; patients who suffer exacerbations or complications during treatment which judged by doctors should discontinue treatment.

## 6. Evaluation standard for curative effect and observation index

6.1 Hamilton Depression Scale (HAMD) 17: In before the treatment and after the end of the 4 - week treatment period, are evaluated with 17 Hamilton Depression Scale (HAMD) separately, and through the score, to evaluate the degree of depression and the efficacy.

6.2 The improvement of Edinburgh - the Scandinavian Stroke Scale (MESSS): In before the treatment and after the end of the 4 - week treatment period, are evaluated with improved Edinburgh - Scandinavian Stroke Scale (MESSS) separately, and through the score, to evaluate the degree of the recovery of the neural function and the efficacy.

6.3 WHO quality of life table-BREF (WHOQOL-BREF): In before the treatment and after the end of the 4 - week treatment period, are evaluated with Who quality of life table-BREF (WHOQOL-BREF) separately, and through the score, to evaluate the improvement of patient in the field of G1, G4, psychological, physiological, social relationship and environment.

## 7. Evaluation standard of curative effect

7.1 Evaluation of the effect of depressive symptoms by HAMD's reduction rate: the effect of the reduction rate = (score before treatment - score after treatment) / before treatment score × 100%. Heal: reduction rate ≥ 75%, or score after treatment < 7 points; significant effect: reduction rate ≥ 50%; effective: reduction rate ≥ 25%; invalid: reduction rate < 25%.

7.2 Evaluation of the effect of the recovery of neural function by the reduction rate of MESSS: Healing: reduction rate in 91% - 100%; significant effect: reduction rate in 46% - 90%; effective: reduction rate in 18% - 45%; invalid: reduction rate ≤ 17%.

**Method:**

1. Basic treatment

Neurology clinics conventional treatments, therapeutic exercises, psychological rehabilitation and Prozac oral (300mg once, 3 times daily) as basic treatment.

2. Group therapy

2.1 Acupuncture group

Acupoint selection: Baihui, shenting; Benshen, Fengchi, Hegu, Shenmen, Neiguan, Zusanli, Taichong, Sanyinjiao, yinlingquan were bilateral. Operation: the acupuncture routinedisinfection, using HuaTuo 1.5 inch needle. Along the scalp, insert 0.5-0.8 inch in Baihui, shenting, Benshen. Direct toward the nose tip into 0.5-0.8 inch in Fengchi. Others points are into 0.5-1 inch. Insert one side for single point and both sides for bilateral points fast. Choose Neiguan, Zusanli, yinlingquan, Sanyinjiao, Shenmen using twisting reinforcing method to get qi. Treat for 30 minutes one time, 2 times a day, 6 days a week, for 4 weeks.

2.2 Electro-acupuncture group (EA group)

Selection of points and operation are the same as acupuncture group. After get the qi, connect bilateral Benshen to electro-acupuncture positive and negative electrode respectively, Baihui and shenting with the same operation. Choose dilatational wave with rarefaction wave 2Hz and dense wave 50Hz, which patients can be tolerance. Treat 30 minutes one time, 2 times a day, 6 days a week, for 4 weeks.

2.3 Music electro-acupuncture group (music EA group)

Selection of points and operation are the same as EA group. Listening antidepressant prescription music through the headset, adjusting volume from small to large until the patients adapt the treatment intensity. Treat 30 minutes one time, 2 times a day, 6 days every week, for 4 weeks.

**Results and discussion:**

1. result

Table 1, comparison of three groups before and after treatment of HAMD ( $\bar{X} \pm S$ )

groups	cases	before treatment	after treatment
acupuncture group	30	16.70±2.61	11.83±1.97
EA group	30	16.57±3.47	11.27±2.64 <sup>■</sup>
music EA group	30	16.47±2.81	5.53±2.22 <sup>°▲</sup>

As can be seen from table 1, after treatment compared with acupuncture group  $P_{\blacksquare} > 0.05$  ( $P_{\blacksquare} = 0.340$ ) compared with acupuncture group  $P_{\diamond} < 0.01$  ( $P = 0.000$ ); compared with EA group  $P_{\diamond} < 0.01$  ( $P = 0.000$ ) indicates music EA group is better than the other two groups in improving depressive symptoms.

Table 2, comparison of three groups before and after treatment of MESSS ( $\bar{X} \pm S$ )

groups	cases	before treatment	after treatment
acupuncture group	30	25.90±6.19	20.47±5.41
EA group	30	25.60±5.50	17.90±4.82 <sup>■</sup>
music EA group	30	26.97±5.18	14.87±3.62 <sup>°▲</sup>

As can be seen from table 2, after treatment compared with acupuncture group  $P_{\blacktriangle} < 0.05$  ( $P_{\blacktriangle} = 0.036$ ) compared with acupuncture group  $P_{\blacktriangle} < 0.01$  ( $P_{\blacktriangle} = 0.000$ ); compared with EA group  $P_{\diamond} < 0.05$  ( $P_{\diamond} = 0.014$ ) indicates music EA group is better than the other two groups in improving nerve function.

Table 3, comparison of three groups before and after treatment of WHOQOL-BREF ( $\bar{X} \pm S$ )

Types of indicators	acupuncture group		EA group		music EA group	
	before treatment	after treatment	before treatment	after treatment	before treatment	after treatment
G1	6.93±2.96	10.53±1.9	6.13±2.03	11.47±2.5	7.3±2.49	14.00±2.52 <sup>▲</sup>
G4	6.13±2.03	10.13±2.03	6.28±2.28	10.40±1.99	6.00±2.03	
physical field	8.89±1.29	10.64±0.88	8.97±0.66	10.67±0.89	8.88±0.91	14.93±2.77 <sup>▲</sup>
psychological field	8.93±1.34	10.96±1.00	8.82±1.00	11.36±0.73	8.47±0.96	11.30±0.93 <sup>▲</sup>
social relationship field	9.73±2.53	11.53±2.09	9.11±1.85	11.87±1.62	9.87±2.09	13.33±1.02 <sup>▲</sup>
environmental field	8.67±1.63	10.52±1.52	8.60±1.52	10.13±1.85	8.33±1.50	10.89±1.16

As can be seen from table 3, after treatment compared with acupuncture group  $P_{\diamond} < 0.01$ ; compared with EA group  $P_{\blacktriangle} < 0.01$ ; compared with acupuncture  $P_{\blacktriangle} < 0.05$  indicates music EA group is better than the other two groups in improving quality of life in G1G4 physical field psychological field.

Table 4, effect comparison of HAMD (cases)

groups	cases	heal	significant effect	effective	invalid	total efficiency
Acupuncture group	30	0	2	14	14	53.33%
EA group	30	1	0	22	7	76.67%
music EA group	30	20	6	4	0	100%

As can be seen from table 4, effect comparison of three groups  $P < 0.01$  ( $P = 0.000$ ) indicates music EA group is better than the other two groups.

Table 5, effect comparison of MESSS (cases)

groups	cases	heal	significant effect	effective	invalid	total efficiency
Acupuncture group	30	0	2	20	8	73.33%
EA group	30	0	2	24	4	86.67%
music EA group	30	0	10	19	1	96.67%

As can be seen from table 5, effect comparison of three groups  $P < 0.01$  ( $P = 0.000$ ) indicates music electro-acupuncture is better than the other two groups.

## 2. Cases of adverse reactions and shedding

Acupuncture group appeared one headache and one subcutaneous ecchymosis patients. EA group appeared one subcutaneous ecchymosis patient. Music EA group appeared one dizzy patient. There is no loss cases because of poor compliance.

## 3. Discussion:

PSD is a common complication of cerebral vascular disease, whose incidence of the stroke patients is about  $1/3 \sim 1/2$ <sup>[1]</sup>. The pathogenesis of PSD is not yet fully clear: it is not only related with the spirit and the psychological stress of the individual reaction to the lesion, but also with the generation and the decreased secretion of the emotion-related neurotransmitters such as 5-HT, NE and DA. PSD can cause decline in patients with memory, attention span<sup>[2-3]</sup> and the recovery speed of the neural function, which seriously affect the functional rehabilitation efficacy<sup>[4]</sup> and impact the

quality of patients' lives<sup>[5]</sup>. Therefore, early diagnosis and treatment of the PSD is of great significance for patients. Although the treatments such as drug therapy, psychotherapy and electroconvulsive therapy have been recognized as effective, each treatment suffers from its own shortcoming such as side effects, high price, or huge pain.

EA music therapy, a low cost treatment method with almost no side effects, combines the advantages of music and electro-acupuncture. On the one hand, it regulates human endocrine system to secrete biological activity material that is conducive to body health by making the organizations and cells resonate with the music through waves and frequencies. On the other hand, it increases patients' pleasure by increasing enkephalin secretion through the electro-acupuncture stimulation. In addition, the music electro-acupuncture therapy can avoid the tolerance phenomenon caused by repeatedly pulse waves released by EA. Thereby it can enrich the sensitivity of the patient, and finally improve the curative effect.

This study shows that EA music therapy can significantly reduce MESSS and HAMD scores, and yet improve the WHOQOL-BREF score which is better than two other groups. Moreover, in the WHOQOL-BREF, the music EA therapy has significant difference compared with the other two groups in the G1, G4, physiological field and psychological field. This study shows that the EA music therapy has almost no side effects, and therefore proved to be a safe and reliable method for the clinical treatment of the PSD.

#### **Conclusion:**

1. The music EA therapy is superior to the other two groups in the fields of improving the depressive symptoms, restoring from the deficit nerve function and improving the quality of the patients' lives.

2. The music EA therapy can comprehensively ameliorate the depressive symptoms of the stroke depressive patients by improving the patient's physical and psychological condition.

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## **Research on the effect of scalp penetrative acupuncture on cerebral branched chain amino acid and monoamine neurotransmitters in rats of sports fatigue**

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**[Abstract] Objective:** To discuss the effect of scalp penetrative acupuncture on cerebral branched chain amino acid and monoamine neurotransmitters in rats of sports fatigue. **Methods:** 48 big rats were randomly divided into 4 groups with a control group (A), a model group (B), a scalp