

## RAPID COMMUNICATION

# Effect of massage in postmenopausal women with insomnia – A pilot study

Denise Oliveira,<sup>1</sup> Helena Hachul,<sup>1,II</sup> Sergio Tufik,<sup>1</sup> Lia Bittencourt<sup>1</sup><sup>1</sup>Universidade Federal de São Paulo, Depto de Psicobiologia, São Paulo, SP, Brazil. <sup>II</sup>Universidade Federal de São Paulo, Depto de Ginecologia, São Paulo, SP, Brazil.Email: helenahachul@psicobio.epm.br  
Tel.: 55 11 21490155

## INTRODUCTION

Nearly 80% of women going through menopause experience some kind of clinical symptom and in 40% of cases the symptoms are sufficiently intense to lead the patient to seek medical assistance.<sup>1</sup> The most common symptoms are vasomotor instability, nervousness, anxiety, irritability, depression and insomnia, all significantly detrimental to well-being. Insomnia is highly prevalent and affects between 28% and 63% of postmenopausal women.<sup>2</sup> The search for complementary therapies is increasing, massage therapy being among these.

The effects of massage on the activation of arterial and venous blood flow, the lymphatic system, in addition to impacting oedema, the conjunctive tissue and muscles,<sup>3</sup> are well known. Through acting on the somatic, autonomic and central nervous system, massage promotes improved visceral functioning and re-establishes homeostasis.<sup>4</sup>

Through cutaneo-muscle stimulation on the surface of the body, the receptors of touch, pressure, heat, vibration and pain are activated and these stimuli are transported to the autonomous and central nervous systems, unleashing neuro-chemical reactions.<sup>5</sup> A recent study showed that women with complaints of insomnia principally chose corporal therapies,<sup>6</sup> whereas another one concluded that massage promotes relaxation and sleep and is identified as an agreeable intervention by the elderly.<sup>7</sup>

Although the benefits of massage were described in a study, no objective parameters of sleep were evaluated.<sup>8</sup> Furthermore, there are thus far no studies which evaluate the effects of massage specifically on postmenopausal women. Other studies observed that yoga improved climacteric symptoms in women in peri-and post-menopause.<sup>9-10</sup>

The objective of this pilot study was to evaluate the effect of therapeutic massage on insomnia, depression, and anxiety through subjective and objective parameters in postmenopausal patients with insomnia.

## MATERIALS AND METHODS

### Subjects

In this study, we selected seven postmenopausal women with insomnia: difficulty in falling sleep or insomnia

symptoms for at least three times a week (mean age  $\pm$  SD: 56.28  $\pm$  1.97(SD), range 50 to 65 years, mean body-mass index (BMI) < 30 kg/m<sup>2</sup>). The study was approved by the Ethical Committee of the Federal University of Sao Paulo (CEP#0408/07). Inclusion criteria required that individuals be in postmenopause (at least 1 year of amenorrhea before enrollment and an FSH level above 30 mIU/mL), with no previous exposure to exogenous hormones.

Exclusion criteria were serious health problems and use of antidepressants or sleep-inducing aids. We also excluded women with sleep apnea (apnea hipopnea index in polysomnography higher than 15/hour).

### Protocol design

Study subjects accordingly underwent the following: a screening interview that included a complete medical history, anamnesis, and Kupperman index<sup>11</sup>, as well as complete gynecological and hematological examinations.

### Therapeutic massage

These volunteers were submitted to sixteen one-hour sessions of massage twice weekly and evaluated on psychological and physiological parameters.

### Questionnaires

Questionnaires were applied before and after intervention. The Inventories of Self-evaluation (Spielberger State Trait Anxiety Inventory- STAI I and II,<sup>12</sup> and Beck Depression Inventory<sup>13</sup>), which evaluate the degree of anxiety and depression of the volunteers, were applied in the pre-trial, 4<sup>th</sup>, 8<sup>th</sup>, 12<sup>th</sup> and 16<sup>th</sup> sessions. The Sleep Diary (Morin, C. version) evaluates sleeping habits, as well as the characteristics and quality of sleep;<sup>14</sup> this questionnaire was responded to on a daily basis by the volunteers.

The State Trait Anxiety Inventory (STAI) is made up of 40 affirmations which relate to the feelings of the individual and is divided into two parts; STAI I and STAI II - each is composed of 20 affirmations to which a score of one to four must be given. The first part evaluates state-anxiety; the second evaluates anxious-trait.

The Beck Depression Inventory is made up of 21 questions – the higher the score attributed to each question, the more depressed is the individual.

The Sleep Diary is an easily completed questionnaire which should preferably be responded to soon after the patient wakes up and carried out for a minimum period of two weeks. This questionnaire contains information such as the time of going to bed, the time taken to fall asleep, how many times the patient

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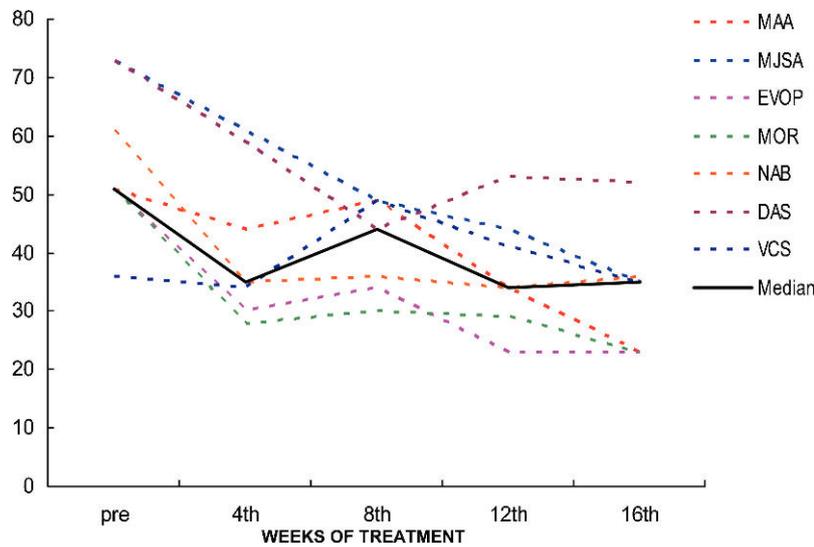


Figure 1 - Anxiety scores of volunteers as evaluated by STAI-5 questionnaire during sessions with therapeutic massage.

awakens during the night, the time of waking up, of getting out of bed, the number of sleep hours, the quality of sleep and the consumption of alcohol and/or coffee, thus describing the characteristics of sleep in the period analysed.<sup>15</sup>

### Polysomnography (PSG)

PSG was performed with a computerized system consisting of surface electrodes for electroencephalography, electromyography, electrooculography, electrocardiography, impedance pneumography to record abdominal/chest movement, thermal sensors and nasal cannula to measure nasal and oral air flow, a sensor to detect body position, a wrist infrared oximeter attached to the patient's distal phalange to gauge oxyhemoglobin, and a snoring sensor.

After the exam, a physician trained in PSG analyzed the sleep stage according to the criteria set forth by Rechtschaffen and Kales.<sup>16</sup> Respiratory events were analyzed by criteria established by the Committee of the American Academy of Sleep Medicine, as were arousals and periodic leg movements.<sup>17</sup>

The other sleep parameters were: sleep latency, REM sleep latency, sleep efficiency, stages 3 and 4, REM sleep.

### Statistical analysis

In the statistical analysis of the data, non-parametric tests were utilized due to the variability of the variables studied. For the analysis of the inventories, the Friedman Test was utilized and for the analysis of the polysomnographia the Wilcoxon Test was used.<sup>18</sup>

## RESULTS

### Sleep and clinical complaints

**a) Subjective questionnaires.** There was a significant ( $p < 0.05$ ) improvement in the symptoms of anxiety and depression.

Figure 1 STAI I

Figure 2 STAI II

Figure 3 BDI

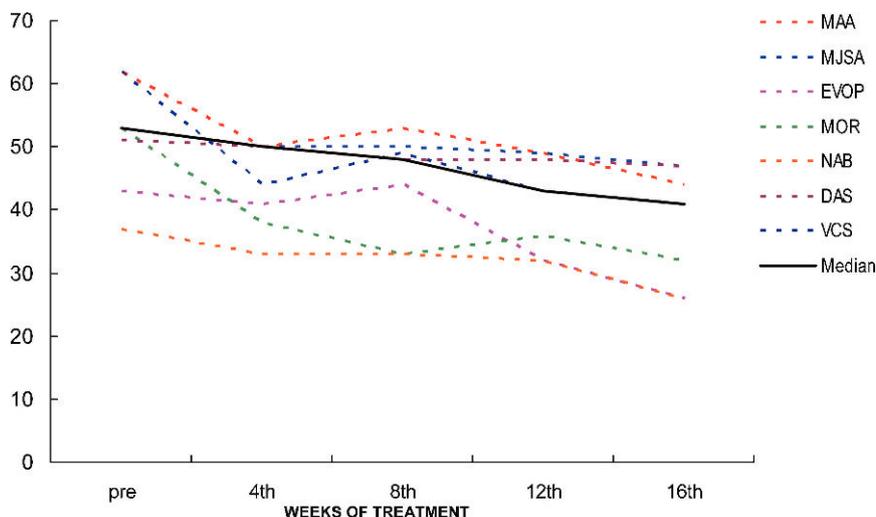


Figure 2 - Anxiety scores of volunteers as evaluated by STAI-T questionnaire during sessions with therapeutic massage.

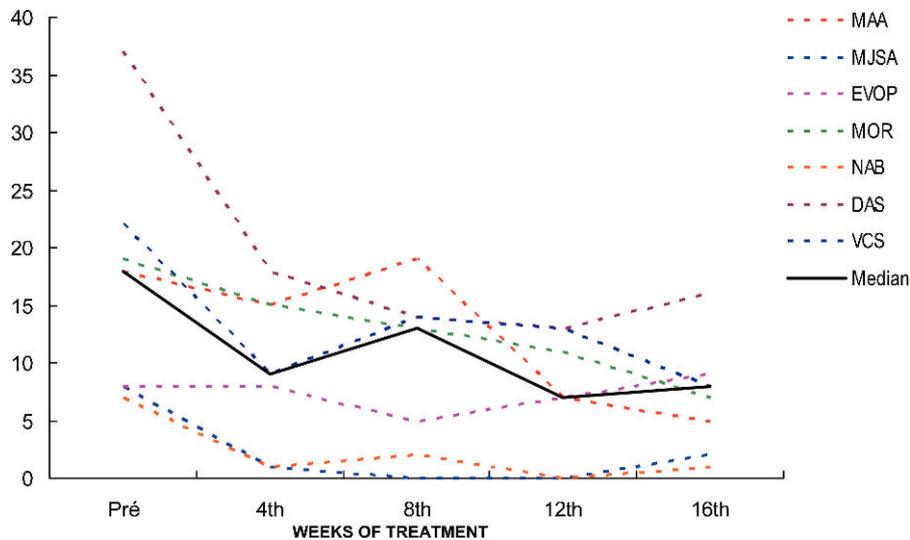


Figure 3 - Depression scores of volunteers as evaluated by BDI questionnaire during sessions with therapeutic massage.

The Sleep Diary showed that all of the participants fell asleep more rapidly, presented a gradual improvement in quality of sleep and awoke feeling better.

**b) Polysomnography (PSG).** For sleep architecture variables, objective measure by PSG indicated that there was a significant difference in REM latency; sleep stage 1; sleep stage 3 and 4.

Table 1 Follow-up

The volunteers were re-evaluated after a period of one year. They did not undergo any other therapy during this time. They were asked about their sleep complaints: two women stated although they had improved sleep during massage treatment, now they are suffering from insomnia. Two women stated that they were sleeping better and three stated that they had no problems at all with their current sleep patterns.

**DISCUSSION**

The present study showed that therapeutic massage decreased the severity of subjective sleep disturbance related to menopause. First, there was a decrease in insomnia and anxiety-depressive symptoms; the treatment also suppressed other menopausal symptoms. Second, PSG findings revealed a decrease in REM latency and increased stages three and four.

Table 1 - Polysomnography results before and after therapeutic massage (TM).

	Before TM	After TM	p value
Sleep latency (minutes)	22 (13)	14 (12)	NS
REM latency (minutes)	165 (111)	90 (53)	0.01
Total Sleep Time (minutes)	343 (42)	333 (49)	NS
Sleep Efficiency (%)	78 (8)	81 (5)	NS
Stage 1 (%)	5 (4)	2 (1)	0.04
Stage 2 (%)	65 (6)	60 (6)	NS
Stage 3 and 4 (%)	13 (6)	20 (5)	0.04
REM (%)	15 (7)	16 (6)	NS
AHI (number/hour)	5 (4)	4 (4)	NS

Values expressed as mean (SD).

AHI: Apnea Hypopnea Index; REM: rapid eye movement

In light of the large number of women suffering from climacteric syndrome, there is a surprisingly skeletal literature on alternative treatments to sleep difficulties in postmenopausal women. Although menopausal women have been the subject of endocrinological research, less attention has been given to treatment by evaluating sleep (subjective and objective). A recent study showed that a large number of postmenopausal women seek complementary and alternative therapies. In this research, 563 women were interviewed and 13.7% preferred the use of massage. Among these women, 81.8% stated improvement in climacteric symptoms after therapeutic massage.<sup>19</sup>

Therapeutic massage reduced stress in various clinical situations such as that of depression, pain syndromes and auto-immune diseases.<sup>20</sup> These parameters were assayed with the measurement of substances like cortisol, serotonin and dopamine. In a study with elderly subjects, it was observed that foot massage (reflexotherapy) improved quality of sleep, reduced depression and increased the level of serotonin.<sup>21</sup> With the same technique, a significant difference was also observed in climacteric symptoms, in fatigue, in total cholesterol and in the level of cortisol.<sup>22</sup>

In a multi-centric controlled study, massage was done to treat insomnia and the Pittsburgh Sleep Quality Index and the Sleepless Anxiety Scale Sleepless Depression Scale were used to evaluate patient symptoms. They concluded that there was a significant improvement in 96% of the cases, similar to the trend observed in this study.<sup>8</sup>

In the post-Women’s Health Initiative era,<sup>23</sup> considerable debate has been directed at the risks of HT. This leads women in menopause to seek beneficial health advice and make positive lifestyle changes. In our study, 16 therapeutic massage sessions showed a significant improvement (p<0.05) in the symptoms of anxiety and depression. With regard to the Diary, there was an improvement in quality of sleep, since all participants fell asleep more rapidly, presented a gradual improvement in quality of sleep and referenced improved well-being upon awakening. Polysomnography revealed a significant difference in REM latency in the first sleep stage and in sleep stages three and four.

One limitation of the present study is the limited number of women as well as the absence of a control group. Nevertheless, these preliminary results indicate that massage can be an alternative in treating postmenopausal women with insomnia.

Based on the present results, we suggest that therapeutic massage is beneficial for improving subjective sleep quality in postmenopausal women, as well as for alleviating symptoms of depression and anxiety. Since sleep complaints are common during menopause, future studies should include a control group to assess the potential of massage as treatment or complementary treatment for insomnia in postmenopausal women.

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