Clinical Case Report Competition

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Will moderate pressure Swedish massage therapy decrease sympotoms in a chronic insomnia patient? A case study

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Abstract

Purpose: The purpose of this study was to investigate the effects of moderate pressure Swedish massage on chronic insomnia symptoms.

Methods: Six treatments over the course of 15 days were administered, using moderate pressure full body Swedish massage. Treatments involved a variety of techniques such as petrissage and light stroking. Outcomes were measured by recording blood pressure and pulse, utilizing an Insomnia Severity Index, and a sleep diary completed by the patient.

Results: By the end of the treatment period all goals had been reached. Sleep quality increased from 3 to 3.8 on a 5 point scale. Blood pressure and pulse decreased nearly every treatment. Time spent awake at night was decreased from an average of 61 minutes to 30 minutes.

Conclusion: The results of this study suggest that moderate pressure massage therapy could be an appropriate treatment for chronic insomnia. Considering the small sample size and short treatment period of this study more research is necessary to determine if massage therapy is an effective intervention for patients suffering from chronic insomnia.

Keyword List

Moderate pressure, massage therapy, chronic insomnia, Swedish massage

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Introduction

Insomnia is a sleep disorder characterized by difficulty initiating and/or maintaining sleep, extended periods of nocturnal wakefulness and/or insufficient amounts of nocturnal sleep (Thorpy, 2012). Prevalence of insomnia is 40% in adults, making it one of the most common sleep disorders. Chronic insomnia is prevalent in 10-15% of the adult population and transient insomnia occurs in 25-35% of the population (Cao, Pan, Li, Liu, 2009). Insomnia is more commonly diagnosed in women (55–60%) than in men (40–45%). It can occur as transient insomnia or become a chronic disorder (Skaer & Sclar, 2010).

Insomnia can be classified as either primary or secondary. Primary insomnia is not caused by any known physical or mental conditions. It can be idiopathic or caused by travel, caffeine intake, poor sleep hygiene, shift work, or periods of grief/depression. Secondary insomnia results from existing medical or psychiatric illnesses, as a side effect of medication, or caused by other sleep disorders such as sleep apnea (Skaer & Sclar, 2010).

Sleep is essential to restore, conserve, and adapt various systemic and neuronal functions. Inadequate sleep can result in physical and cognitive dysfunction(Reeve, Bailes 2010). Patients with insomnia may feel exhausted, tense, irritable, have delayed reactions, an inability to focus, or experience headaches (Cao et al, 2009). Left untreated, insomnia is linked to increased illness and morbidity. There is a wealth of research indicating that insomniacs have a

higher incidence of depression and poorer overall health. (National Sleep Foundation, 2013**)**

Drug therapy is a common treatment for insomnia. The commonly used medications include hypnotic sedative agents. These medications potentially cause adverse side effects such as damage of memory, drug resistance and dependency(Cao et al, 2009). There are also several non pharmacological treatments used, including herbal therapy, exercise, massage therapy, acupuncture and cognitive behavioural therapy(Cao et al, 2009).

Given the obvious disadvantages of pharmacological interventions, alternative treatments are worth pursuing. Some documented effects of massage therapy include the ability to reduce stress, anxiety and depression and give the client a feeling of well being. These effects are well documented (Rattray 2014). Treating the precipitating factors appears to be essential for aiding sleep, explaining why massage could be a potentially beneficial treatment for patients suffering with insomnia.

The literature is lacking evidence supporting the use of massage therapy to treat primary chronic insomnia. The research question being addressed: Will moderate pressure Swedish massage therapy decrease symptoms in a chronic insomnia patient?

Methods and Procedures

Subject Case History

The subject of the Case Study is a single 25 year old Caucasian male. He is employed as a manual labourer doing physically demanding rebar work full time. The subject lives in an apartment, shared with one roommate.

The chief complaint is Insomnia, diagnosed by a medical doctor 12 years ago. The patient sleeps an average of 3-4 hours per night. The Insomnia has been consistent since diagnosis. The subject has Insomnia symptoms every night, with no remission periods.

His symptoms are described as an increased duration of time required to fall asleep, frequent awakenings in the night with difficulty falling back asleep once awake, and early awakening in the morning. There are minimal accompanying symptoms. He experiences increased irritability if the night prior was exceptionally poor sleep. Migraines occur 1-2 times per month which may or may not be related to the Insomnia.

The patient runs or swims twice a week for 45 minutes, and does light body weight exercises every other day. His father is terminally ill with cancer which increased the stress level in his life significantly, although the patient reported that it didn't change his sleeping patterns.

Numerous other treatments have been sought out by the patient in the past 12 years. They include: acupuncture, exercise regimes, Aromatherapy, diet

alterations, and sound therapy. None of these alternative treatments have proved to be helpful for the patient. The amount of time spent with each of these treatments is unknown.

Current treatment includes two prescription sleeping aids: Novo Nortiptyline(Novo) and PMS Trazodone(Trazodone) each night before bed. The prescription is for 25 mg of the Novo and 50 mg of the Trazodone. The subject typically takes one Trazodone per night before bed and the Novo only when he has had a very poor sleep the night prior or if it's taking him hours to fall asleep, he requires 2-3 of them to feel an effect.

There is no patient history of health problems related to Insomnia. Migraine headaches are the only other concern that may be related. The patient's overall health is good, blood pressure and pulse in the normal range. The patient presents with overall average posture. Slight head forward posture is present with hyperextended knees bilaterally.

The patient expects to have insomnia for the rest of his life but remains optimistic someday he will discover a therapy to improve his quality of sleep.

Assessment

Physiological hyperarousal can be a precipitating factor in insomnia patients and can been measured with various autonomous indicators, e.g, blood pressure or heart rate (Unbehaun, Spiegelhalder, Hirscher, Riemann, 2010). In

this study, blood pressure (BP) and pulse were used every visit before and after treatment to monitor the Sympathetic Nervous System firing. A manual blood pressure cuff and a 30 second pulse count was used. The Insomnia Severity Index(ISI) was administered on the first and last treatment. The ISI was designed to assess the nature, severity, and impact of insomnia and to monitor treatment response (American Thoracic Society, 2014).

A sleep diary was also utilized, as shown in appendix A**.** The patient answered a series of questions each morning about the previous night's sleep. This diary was completed everyday throughout the treatment period as well as the 3 weeks prior to the study to be used as a control. The most important parameters in the diary include time required to fall asleep, time spent awake during the night, and overall quality of sleep.

Treatment Goals

The treatment goals for the study were to decrease Sympathetic Nervous System (SNS) firing, decrease time spent awake at night, and improve overall sleep quality. These goals are patient centric and in line with the patients goals for treatment.

Treatment Plan

A study was done investigating massage effects on postpartum women with insomnia. The results showed that all of the participants fell asleep more rapidly and presented a gradual improvement in quality of sleep (Oliveira, Hachul, Tufik, Bittencourt 2011). This study utilized a treatment regime of 2 times per week, thus supporting the treatment timing in this study. Moderate pressure has shown to be more effective stress reduction in adults versus light or vibrational pressure (Field, Diego, Hernandez-Reif, 2010). Moderate pressure massage may stimulate subdermal pressure receptors that are innervated by vagal afferent nerve fibers, which project to structures responsible for autonomic nervous system regulation. Several studies indicate that moderate pressure massage can stimulate the parasympathetic nervous system response resulting in decreased heart rate and blood pressure(Field, 2010).

Treatment for this study consisted of a full body Swedish relaxation massage at moderate pressure. Treatments were administered 2 times every 5 days, totalling 6 treatments. A pain scale from 1-5 was used, one being light touch 5 being too painful. Moderate pressure was maintained throughout the treatment as best possible, striving for a 3 on the pain scale at most times. This was accomplished by checking in with the patient often. To maintain validity, hydrotherapy and remedial exercise were excluded from the study.

The treatments began with the patient lying in the prone position, where the back and posterior legs were treated. In the supine position the arms, anterior legs and head and neck were treated. To start the treatment full body compressions were administered at a slow rate, followed by grounding with diaphragmatic breathing.

Back: palmar bowing of the erector spinae group and upper trapezius, effleurage in a caudal direction, fingertip kneading around sacrum, knuckle kneading of the superior portion of the gluteals, deep palmar stroking of erector spinae group and rhomboids in a caudal direction, wringing, ulnar border of quadratus lumborum, petrissage to upper trapezius, bowing and peeling away of upper trapezius, effleurage in a caudal direction. Light stroking caudally

Gluteals: deep palmar compressions

Posterior legs: compressions separating muscles, effleurage, wringing, deep palmar stroking, deep knuckle stroking, finishing effleurage strokes directed towards feet

Anterior legs: compressions, deep palmar and knuckle stroking, effleurage strokes and light fingertip stroking directed towards feet

Arms: Palmar stroking rhythmically anterior to posterior over shoulder, effleurage, picking up of Triceps Brachii and Biceps Brachii, thumb stroking forearm muscles, thumb kneading palm and finger pulls. Light fingertip stroking moving distally

Head and neck: effleurage, fingertip and knuckle kneading of pectoral region, petrissage upper trapezius, fingertip kneading of suboccipitals and temporalis.

After the first treatment the gluteal work was modified from deep knuckle kneading to palmar kneading. This was done for patient comfort, as the knuckle kneading was too deep and appeared to cause increased tension in the body.

Results

The results of this study overall support the hypothesis. The first goal was to decrease SNS firing to facilitate healthy sleep. The outcome measures used for this goal were BP and pulse. As shown in figure 2 and 3, massage decreased BP and pulse nearly every treatment.

The second goal was to decrease time spent awake in the night. As seen in figure 1, by the end of the study, time awake at night had been nearly cut in half, decreasing from an average of 61 minutes to 30 minutes.

The final goal to improve overall sleep quality was reached during the final portion of treatment. As figure 1 illustrates, quality increased from 3 to 3.8 on a 5 point scale. The insomnia severity index score decreased one point, from 17 to 16 remaining in the moderate severity of clinical insomnia category. The ISI can be seen in Appendix B.

	Control	**Days 1-5**	**Days 6-10**	**Days 11-15**
Time to fall asleep	46 min.	42 min.	36 min.	36 min.
Time awake in night	61 min.	78 min.	36 min.	30 min.
Quality of sleep (out of 5)	3	2.6	2.8	3.8

Figure 1: Sleep Diary averages for control period and for treatment period broken into 3 segments.

Treatment #	**BP**		**PULSE**	
	Before	After	Before	After
1	121/76	119/74	76	68
2	110/62	109/65	88	72
3	118/72	116/78	86	68
4	111/84	110/78	80	88
5	119/72	110/84	116	100
6	104/62	110/79	78	74

Figure 2: Blood pressure and pulse values pre and post treatment.

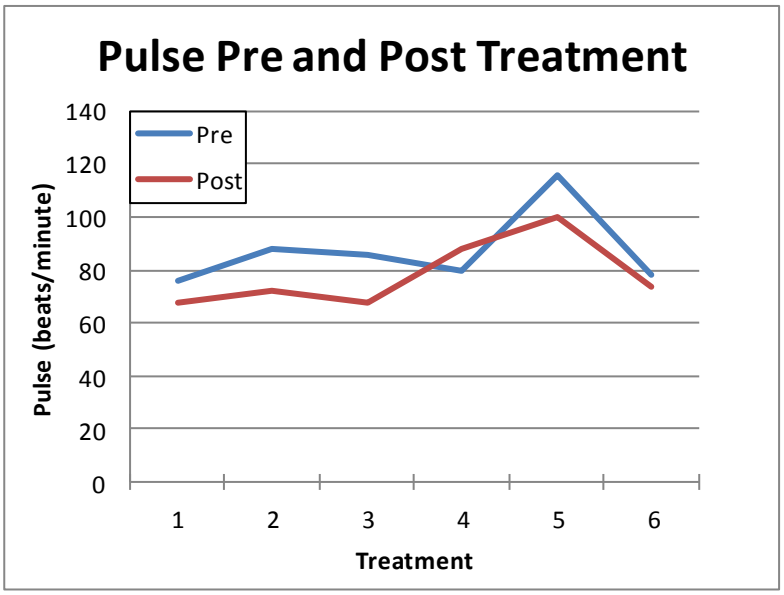

Figure 3: Graph of Pulse pre and post treatment.

Discussion

This study has supported the hypotheses that moderate pressure massage can decrease symptoms of chronic insomnia. Moderate pressure full body massage decreased time required to fall asleep, increased quality of sleep, and decreased time awake during the night. All three goals of treatment were reached by the end of the study.

Sleep quality did not improve significantly until near the end of the treatment period. This suggests that multiple applications of massage may have a cumulative effect over time.

The patient had an exceptionally poor sleep after the very first day of treatment. This particular night, the time spent awake at night was 180 minutes. This skewed results significantly showing an increase of time awake during the night in the first 5 days of treatment. The reason for this is unknown although it is speculated that the massage was a change in routine and could have temporarily affected sleep.

Decreased SNS firing can be observed in Figure 2 and 3, as BP and pulse decreased after each treatment. Although this occurred, it did not seem to directly correlate with an improved night's sleep. Sleep quality did not seem to change drastically on treatment days compared to non-treatment days, even though it improved over the course of the treatment period.

The bed times became more consistent during the treatment period. This can be seen in the sleep diary found in Appendix A. To maintain validity, there was no instruction given by the therapist to alter any aspect of sleep hygiene. It is impossible to know if this was caused by a decrease in SNS firing which may have prepared the patient for sleep, or if the subject altered these consciously for the study.

Although this particular study does support massage therapy for treatment of chronic insomnia, further research is needed. Many of the studies published on this topic are measuring insomnia as a secondary concern, or in a very specific population such as post-menopausal women. Limiting factors of this study

include the small sample size that a case study allows for, and the short duration. As this study suggests, massage may have a cumulative effect and increase effects may occur over time. Further studies need to be done with a larger sample size and longer treatment period.

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Appendix A

Sleep Diary

Week 1 Control

		Dec, 14 Sat	Dec 15 Sun	Dec, 16 Mon	Dec, 17 Tues	Dec, 18 Wed	Dec, 19 Thur	Dec, 20 Fri
1	At what time did you go to bed last night?	12:00	10	11	10	11	9:30	10:30
2	After settling down, how long did it take you to fall asleep?	30min	1h	30	30	30	1	30
3	After falling asleep, about how many times did you wake up in the night?	3	2	1	2	1	2	1
4	After falling asleep, for how long were you awake during the night in total?	1.5h	1.5	.5	1h	.5	1	.5
5	At what time did you finally wake up?	5am	5	5	430	4	4	4
6	At what time did you get up?	7:15	5	5	5	5	430	4:30
7	On a scale of 1 to 5, with 1 being very poor and 5 being very good, how would you rate the quality of your sleep?	3	3	3	2	2	3	3

Week 2 Control

		Dec, 21 Sat	Dec, 22 Sun	Dec, 23 Mon	Dec, 24 Tues	Dec, 25 Wed	Dec, 26 Thur	Dec, 27 Fri
1	At what time did you go	2am	9pm	11	12	11:30	10	2

	to bed last night?							
2	After settling down, how long did it take you to fall asleep?	15	30	30	30	1	30	15
3	After falling asleep, about how many times did you wake up in the night?	0	1	2	3	2	1	1
4	After falling asleep, for how long were you awake during the night in total?	0	2	1.5	1	1	1.5	1
5	At what time did you finally wake up?	5:30	4	5:30	6	5	4:45	6
6	At what time did you get up?	7	4:30	5:30	6	5	5	6
7	On a scale of 1 to 5, with 1 being very poor and 5 being very good, how would you rate the quality of your sleep?	3	3	3	3	3	3	4

Week 3 Control

		Dec, 28 Sat	Dec, 29 Sun	Dec, 30 Mon	Dec, 31 Tues	Jan, 01 Wed	Jan, 02 Thur	Jan, 03 Fri
1	At what time did you go to bed last night?	1:15am	12:00am	1	11	2	9:30	12
2	After settling down, how long did it take you to fall asleep?	1	1	1	1	1	2	1
3	After falling asleep, about how many times did you wake up in the night?	1	0	0	0	2	3	3
4	After falling asleep,	30	0	0	0	1	4	1.5

	for how long were you awake during the night in total?							
5	At what time did you finally wake up?	6:30	5:30	4:30	4:30	7	7:30	6
6	At what time did you get up?	7	5:30	5	5	7:30	8	6
7	On a scale of 1 to 5, with 1 being very poor and 5 being very good, how would you rate the quality of your sleep?	3	4	3	3 2h nap 1-3pm	3	4	3

Treatment begins Thursday Jan 9th (Bolded columns are treatment days)

		Sat Jan 04	Sun Jan 05	Mon Jan 06	Tues Jan 07	Wed Jan 08	**Thur Jan 09**	Fri Jan 10
1	At what time did you go to bed last night?	12	10	10	10	10:30	**9:30**	9:30
2	After settling down, how long did it take you to fall asleep?	2.5	1	.5	1.5	.5	**1**	.5
3	After falling asleep, about how many times did you wake up in the night?	1	4	2	2	2	**1**	1
4	After falling asleep, for how long were you awake during the night in total?	1	3h	2	.5	1.5	**3**	1
5	At what time did you finally wake up?	4:30	5	3	4	4	**2**	5
6	At what time did you	5	5	4	5	4	**5**	5

	get up?							
7	On a scale of 1 to 5, with 1 being very poor and 5 being very good, how would you rate the quality of your sleep?	2	3	3	3	3	**1 woken up by roommate**	3

		11	**12**	13	**14**	15	16	17
1	At what time did you go to bed last night?	1	**10**	11	**10**	9	9	9
2	After settling down, how long did it take you to fall asleep?	.5	**1**	.5	**.5**	.5	.5	1
3	After falling asleep, about how many times did you wake up in the night?	2	**2**	2	**1**	3	2	0
4	After falling asleep, for how long were you awake during the night in total?	1	**.5**	1	**.5**	1	.5	0
5	At what time did you finally wake up?	6:30	**5**	5	**4:30**	4	4:30	12:45
6	At what time did you get up?	7	**5**	5	**5**	4:30	4:30	5
7	On a scale of 1 to 5, with 1 being very poor and 5 being very good, how would you rate the quality of your sleep?	3	**3**	3	**3**	3	3	1

		18	19	**20**	21	22	**23**	24
1	At what time did you go to bed last night?	**10:30**	10	**10:30**	10	11	**10**	10
2	After settling down, how	**.5**	.5	**.5**	.5	1	**.5**	.5

	long did it take you to fall asleep?							
3	After falling asleep, about how many times did you wake up in the night?	**2**	1	**2**	1	0	**1**	0
4	After falling asleep, for how long were you awake during the night in total?	**1**	.5	**.5**	.5	0	**1**	0
5	At what time did you finally wake up?	**8**	4	**4**	4	4	**4:30**	3
6	At what time did you get up?	**8**	4:30	**4:30**	4:30	5	**5**	4
7	On a scale of 1 to 5, how would you rate the quality of your sleep?	**4**	3	**4**	4	4	**4**	3

Appendix B

Insomnia Severity Index

Appendix C

Treatment charting