Effects of Posteroanterior Thoracic Mobilization on Heart Rate Variability and Pain in Women with Fibromyalgia

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KEY POINTS FROM THIS ARTICLE:

1) Fibromyalgia (FM) is characterized by chronic pain, fatigue, depression, insomnia, and reduced cognitive performance.

2) Fibromyalgia is associated with cardiac autonomic abnormalities and pain.

3) Heart rate variability is reduced in fibromyalgia with increased sympathetic tone and activity.

4) It is thought that there is a relationship between increased sustained sympathetic activity and tone and the symptoms of fibromyalgia. "Some studies suggest autonomic imbalance mechanistically contributes to the symptoms [of fibromyalgia]." "The autonomic imbalance for fibromyalgia is characterized by sympathetic hyperactivity at rest."

5) "Sympathetic hyperactivity may also be responsible for frequent complaints of cold extremities [in fibromyalgia patients.]" "Studies have shown that fibromyalgia may be related to changes in autonomic tone, shifting toward an increase in sympathetic activity."

6) Heart rate variability is used to investigate cardiovascular autonomic modulation as a simple, sensitive, and noninvasive tool. There exists a "link between abnormal ratios of sympatho-vagal balance in patients with fibromyalgia," and heart rate variability analysis may prove to be valuable for fibromyalgia assessment and progression.

7) The purpose of this study was to evaluate the effects of one session of a posteroanterior glide technique on both autonomic modulation and pain in woman with fibromyalgia. The study used 20 women, half with diagnosed fibromyalgia. This is the first study to demonstrate the effect of a posteroanterior glide mobilization to the thoracic spine on autonomic modulation in patients with fibromyalgia. The mobilization technique used in this study was passive P-A push, sustained for 60 seconds at the T1-T2 spinal level, "corresponding to the thoracic sympathetic preganglionic neurons."

8) The upper thoracic mobilization was able to improve heart rate variability and improve autonomic profile through increased vagal activity. In women with fibromyalgia and impaired cardiac autonomic modulation, one session of Maitland spine mobilization was able to acutely improve heart rate variability.

9) "It seems that manual techniques improve quality of life and symptomatology [in patients with fibromyalgia]," as noted by these studies:

- Manual therapy was effective in improving pain intensity, widespread pressure pain sensitivity, the impact of fibromyalgia symptoms, sleep quality, and depressive symptoms.

- Manual therapy is effective in increasing cardiac parasympathetic activity, reducing sympathetic activity, and reducing pain and stress in patients with back pain associated with myofascial trigger points.

- Myofascial trigger-point therapy to the head, neck, and shoulder areas is effective in increasing cardiac parasympathetic activity.

- Osteopathic manipulation in female patients with fibromyalgia, 1 treatment per week for 23 weeks, "was able to raise pain thresholds, improve comfort levels, effect components related to chronic illness, and increase perceived functional capacity."

- Massage-myofascial release therapy reduces the sensitivity to pain at tender points in patients with fibromyalgia, improving their pain perception.

- Manual therapy protocols are effective in improving pain intensity in fibromyalgia patients.

10) "The main finding of our study was that patients with fibromyalgia presented with important deleterious alterations in heart rate variability at rest suggesting increased sympathetic and decreased parasympathetic activity."

11) This study shows that "patients with fibromyalgia have increased sympathetic activity and decreased activity in the vagal control of heart rate." "This sympathetic excitation could contribute to the diffuse pain and tenderness at specific points experienced by patients with fibromyalgia."

12) "The potentially significant impact of our findings is the demonstration that only one session of this manual intervention to the thoracic spine was able to modify heart rate variability in women with fibromyalgia."

13) "Considering that there is a correlation between autonomic dysfunction and symptom severity or quality of life, these results may represent clinical benefits to patients who suffer from this condition."

14) Studies "have shown that spinal manipulation is able to modulate autonomic nervous activity."

15) A 1988 study "examined the effect of chiropractic manipulation to T1–T5 spine segments in patients with arterial hypertension. Immediately after the intervention, they observed a reduction in systolic and diastolic blood pressure and anxiety level."

16) A 2000 study showed that 10 sessions of chiropractic manipulation applied to C3 to L5 produced a "reduction in sympathetic activity."

17) This current study showed a significant increase in parasympathetic activity after one session of manual mobilization in the fibromyalgia subjects.

18) "It is plausible to hypothesize that the posteroanterior glide technique utilized in the current study may significantly contribute to reducing the debilitating signs and symptoms of fibromyalgia, improve quality of life, and reduce cardiovascular risk when applied for more than one session."

19) "The current study observed that women with fibromyalgia present with altered heart rate variability indices reflecting sympathetic hyperactivity at rest."

20) After fibromyalgia subjects underwent one session of a posteroanterior glide mobilization technique to the thoracic spine, there was a significant improvement in their autonomic profile through increased vagal activity.

COMMENTS FROM DAN MURPHY:

Studies we review continue to paint a model applicable to the chiropractic subluxation and the spinal adjustment:

- There is an optimum balance of activity between the ***sympathetic*** and the ***parasympathetic*** nervous system. When the balance is disrupted, it influences systemic health.

- When spinal joints have altered biomechanical function, there is an increase in ***sympathetic*** tone, creating an imbalance with ***parasympathetic*** tone.

- When an applied mechanical force to the spine is applied, increased sympathetic tone is inhibited, restoring autonomic balance, homeostasis and health.