Physiological Changes Following Thermomechanical Massage in a Population of Hypertensive Patients and/or Type II Diabetics

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ABSTRACT

Introduction: This pilot study presents findings regarding the influence of the Migun HY 5000 thermomechanical massage device™ on three populations of patients diagnosed respectively with hypertension, type II diabetes, or hypertension and type II diabetes. A previous paper describing thermomechanical massage made a link to chiropractic from the standpoint that thermal and/or mechanical devices have long been used in conjunction with, or as part of, chiropractic care (i.e., Spinalator, Anatomotor, Spinalign, Chattanooga Ergo Wave, Model CBR Massage Table, AME Quest Intersegmental Traction Table ATT-300). A second rationale for investigating this device is associated with the on-going quest to evolve non-medicinal approaches for overall physiological enhancement.

Purpose: The present pilot study was conducted to achieve an initial impression of the efficacy of the Migun HY 5000 thermomechanical device (bed) on hypertensive and type II diabetic subjects.

Discussion: Hypertensive subjects exhibited significant decreases in systolic, diastolic, and pulse pressures after commencing Migun thermomechanical massage. Type II diabetic subjects exhibited significant decreases in both fasting and 2hrPP blood glucose levels after commencing Migun thermomechanical massage. Hypertensive/type II diabetic subjects exhibited statistically significant reductions in systolic, diastolic, and pulse pressures after commencing Migun thermomechanical massage. A possible mechanism of action is proposed for the pathways affected by Migun thermomechanical massage relative to the hypothalamic-pituitary-adrenal cortex axis.

Conclusion: The pilot study provides only preliminary, limited empirical data. Consequently, while further study is suggested, the results, though high in consistency and magnitude of clinical effect (effect size) and similarity regarding duration of care prior to subjective reporting of initial improvement must be interpreted cautiously.

Key words: Hypertension, Systolic BP, diastolic BP, Pulse Pressure, Type II diabetes, blood glucose, chiropractic, thermal massage, mechanical massage, Migun.

Introduction

The purpose of this pilot study is to present findings regarding the influence of a thermomechanical massage device on three populations of patients, diagnosed respectively with hypertension or type II diabetes or hypertension and type II diabetes. The Migun thermomechanical device,™ is variously referred to herein as Migun, Migun device, thermomechanical massage Migun device. It is manufactured by Migun Medical Instruments International, Taejon, Korea.

A previous report ¹ provided a general overview of the Migun device drawing upon anecdotal reports of effectiveness. That study was based on commentary from medical doctors in China and Korea treating 76 patients, pre and post thermomechanical massage with the Migun device. The patients involved presented with problems in the following systems: musculoskeletal, gastrointestinal, nervous, cardiovascular, integumentary, urological and endocrine, and respiratory. An additional 238 patients in Seoul Korea, with similar disorders, were also surveyed for self-reports of effectiveness of the Migun device.

The data from that study led to the suggestion that Migun thermomechanical massage may provide health benefits across

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a wide range of disorders. Recommendations were made for further study, including use of standardized outcome measures, such as the Self-Reported Health and Wellness Survey. This approach would be in conjunction with controlled clinical trials across a large statistical population of Migun users to evaluate the health benefits of the device.

As the next step in assessing the impact of thermomechanical massage on health disorders, limited empirical data derived from the Korean population previously studied has been further evaluated in this pilot study. This study was conducted to determine if evidence could be provided to justify a large-scale clinical trial.

The choice of preliminarily assessing Migun in three populations, respectively exhibiting hypertension, type II diabetes, and both conditions concomitantly, is underpinned by two factors. The first deals with the prevalence of these conditions and their impact on society as a whole. In that regard, the estimated prevalence of diabetes in 1997 was 124 million worldwide, with 97% being type II. King et al. have made projections from World Health Organization (WHO) data and other demographic information provided through the United Nations. These projections suggest that the number of people with diabetes, worldwide, will be 221 million in 2010 rising to 300 million by 2025. The most pronounced increases in diabetes were expected to occur between 1995 and 2025 in the Americas (30.7 to 63.5 million), the Eastern Mediterranean (13.8 to 42.8 million), Southeast Asia (27.6 to 79.5 million), and the Western Pacific (26.4 to 56 million).

Moreover, the CDC estimates that 6.2% (17 million) of the United States had diabetes in 2000 with 9% being greater than or equal to 20 years of age and 20.1% being 65 or older.

The United Kingdom Prospective Diabetes Study (1997) found evidence that tight control of blood glucose and blood pressure of less than 144 over less than 82 decreased the risk of the long term complications of diabetes. The study found that those with the best control of blood glucose and blood pressure had a 37% risk decrease for small vessel complications, 44% reduced risk of stroke, 56% reduced risk of heart failure and a 32% reduced risk for all diabetes related deaths.

Although hypertension can be present in non-diabetes, type II diabetes often develop hypertension hence linking the two disorders. Jaber and colleagues found a possible positive correlation between glycemia and blood pressure in black, type II diabetic, hypertensive patients.

Wolz and colleagues released information from the National High Blood pressure Program based on a definition of hypertension as systolic pressure greater than 140mm Hg, or a diastolic pressure greater than 90, or if the subject was taking medication for hypertension. Based on this information it was estimated that 42.3 million have hypertension.

Lifestyle changes believed to be health promoting (exercise, cessation of smoking, weight loss, low sodium diet, vegetarian/ low fat diet and conservative alcohol consumption) could be effective in lowering blood pressure in many cases. However, because of the insidious nature of hypertension these changes are often ignored resulting in stroke or other cardiovascular episodes, too often with debilitating consequences or death. Mehler and colleagues found that intensive blood pressure control reduces the risk of cardiovascular events in patients with peripheral arterial disease and type II diabetes. Hence the importance of lowering and regulating blood pressure is important from the standpoint of both improved health for non-diabetics as well as decreasing the risk of cardiovascular events in type II diabetes with hypertension.

The second underpinning factor is linked to the on-going quest to evolve non-medicinal approaches for overall enhancement. In that regard, a previous paper describing thermomechanical massage, made a link to chiropractic from the standpoint that thermal and/or mechanical devices have long been used in conjunction with or as part of chiropractic care (i.e., Spinalator, Anatomotor, Spinalign, Chattanooga Ergo Wave, Model CBR Massage Table, AME Quest Interssegmental Traction Table ATT-300). Consequently it is proposed that the thermomechanical massage device used in this study may be of further benefit to the chiropractic profession. This second factor in choosing subjects with hypertension and type II diabetes was also linked to outcomes reported in association with chiropractic care. That is, while chiropractic does not have treatment of medical disorders as one of its objectives, the literature does reveal significant findings in relation to the lowering of blood pressure in hypertensive patients while under chiropractic care. Moreover, improvement in blood glucose levels in type II diabetics has also been demonstrated. As well, the problems associated with medical (pharmaceutical) management of these conditions are well documented.

Thus, these authors seek a non-pharmaceutical approach to improving health that also has the possibility of benefiting patients with serious conditions. This approach could be provided singularly, or more desirably, coupled with other modes of health care delivery. If the non-pharmaceutical approach demonstrated chiropractic care could be coupled with another form of care that may also ameliorate aberrant physiology, the patient would ultimately be the benefactor through a possible synergistic effect. That is, concomitant care utilizing the two approaches could result in a greater overall effect than either applied alone. Much like the chiropractic practice philosophy the administration of thermomechanical massage via the Migun device is not provided for the cure of any specific disorder. Although positive outcomes have been anecdotally reported for a number of conditions the application of the Migun Thermomeric Massage is based on acupuncture theory originating in China. This theory proposes that energy circulates through the body in well-defined pathways, or meridians linking to the internal organs of the body. The Migun thermomechanical device targets two primary meridians overlying the spinous processes of the vertebrae and the distal parts of their transverse processes. This non-pharmaceutical approach to, believed to stimulate the flow of energy through these meridians may be a useful complement to other non-pharmaceutical approaches such as chiropractic.

To test this hypothesis, the present pilot study has investigated the influence of Migun thromomechanical massage in patients already under medical care. Prior to assessing its effectiveness in combination with other non-medical-methods, it was considered prudent to begin the process by first assessing its efficacy in terms of demonstrating if positive outcomes could be achieved beyond those anticipated with medications alone.
Methods and Materials

Subjects

The subject pools for this study were drawn from a population of 238 patients that were being cared for, for a variety of disorders by physicians in South Korea. Patient data was collected from 25 different Migun centers throughout the country. The center were available to all who could access them, as frequently as they pleased, receiving Migun thermomechanical massage free of charge. One intent of this pilot study was to control for patients that had a variety of serious, possible interacting conditions. Thus, only those subjects that presented with one or two major complaints were included. That delineated and limited the population to hypertension (n=16) and type II diabetes (n=12) and a third group that had both hypertension and type II diabetes (n=19). The hypertension group was composed of 8 females with a mean age of 64 ± 9.9 and 8 males with a mean age of 69 ± 9.0. The type II diabetic group had 8 females with a mean age of 65 ± 8.8 and 4 males with a mean age of 64 ± 2.8. The hypertensive/type II diabetic group (n=19) was composed of 7 females age 66 ± 7.8 and 12 males age 69 ± 7.9.

Blood Pressure Readings

The hypertensive and hypertensive/type II diabetic subjects were under medical treatment, receiving condition specific medication prior to commencing Migun thermomechanical massage and remained under medical supervision while receiving Migun. Blood pressure readings were taken regularly with a sphygmomanometer with the subject seated. The blood pressure readings just prior to commencing Migun sessions are reported in this study as “Before Migun.” Although most of the hypertensive patients home monitor their blood pressure, a subsequent blood pressure reading was taken after Migun sessions commenced during the subjects regularly scheduled appointment established by their physician between January and February of 2003. These data are presented as “After Commencing Migun.” The same designations were used for blood glucose determinations.

Blood Glucose Levels

The type II diabetic and type II hypertensive subjects were under medical treatment, receiving condition specific medication prior to commencing Migun thermomechanical massage and remained under medical supervision after commencing Migun. A fasting and two-hour postprandial (2hrPP) blood glucose level (mg/100 ml) were determined shortly before commencing Migun and reported in this study as “Before Migun.” Although subjects home monitored blood sugar levels, this report presents the last fasting and 2hrPP (after eating) that was conducted by their physician after commencing Migun during their regularly scheduled office visit between January and February 2003.

Migun Device

The device used to provide thermomechanical massage to the subjects in this study is a bed (Migun HY-5000) is designed to access two regions of the spine at the same time. It consists of 2 mounted probes each containing 5 helium bulbs that are moved horizontally to massage the back, from occiput to sacrum, with the patient in the recumbent position. Another hand held 5 helium bulb probe was accessible to the subject to be moved over any area of their body at will.

Statistical Treatment of Data

Systolic and Diastolic blood pressure readings “Before Migun” and “After Commencing Migun” were compared by a paired two-tailed Student’s T test, P < 0.05. Fasting and 2hrPP blood glucose values were also compared in the same manner.

In order to test the strength of the bivariate relationships/magnitude of clinical effect before Migun and after commencing Migun, effect size was determined after the method of

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<tr>
<th>Table 1. Changes in Systolic, Diastolic and Pulse Pressure in Hypertensive Subjects* Before and After Commencing Thermomechanical Massage</th>
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<tr>
<td><strong>Blood Pressure</strong> (mm Hg) (mean ± s.d.)</td>
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<tr>
<td><strong>Before</strong> Migun</td>
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<tr>
<td>Systolic (n=14)</td>
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<td>Diastolic (n=14)</td>
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* Patients were diagnosed with essential hypertension in Seoul Korea at varying dates prior to 2003. Subjects received condition specific medication for essential hypertension prior to commencing Thermomechanical massage (Migun) and throughout the duration of Migun sessions. Blood pressure was taken seated with a sphygmomanometer at scheduled appointments. The last blood pressure reading taken, prior to commencing Migun, is reported in the Table above as before Migun. After commencing Migun Blood pressure was taken between January and February, 2003 during regularly scheduled visits to the physician's office.

** Significant numbers are in bold. Means were compared by a paired two-tailed Student’s T test with P < 0.05.