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The Frequency of Positive Common Spinal Clinical Examination Findings in a Sample of Premenstrual Syndrome Sufferers

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ABSTRACT

Objective: As part of a randomized clinical trial to determine the efficacy of chiropractic therapy on premenstrual syndrome (PMS), subjects were evaluated for initial underlying spinal dysfunction.

Subjects: Fifty-four subjects with diagnosed PMS (using a Moos PMS questionnaire plus daily symptom monintoring) and 30 subjects with no diagnosable PMS were recruited by newspaper advertising and referrals.

Design: All subjects underwent a full history and physical and chiropractic examination carried out by 1 of 2 fully qualified and registered chiropractors, each with a minimum of 10 years experience. The results of the assessment for the PMS group were compared with those of the non-PMS group.

Setting: RMIT teaching clinics.

Data Analysis: The data collected were entered into a spread sheet and contigency tables were created. The data were analyzed by use of chi-squared tests, with the statistical significance being set at $P < .05$.

Results: The PMS group had a higher percentage of positive responses for each of 12 measured spinal dysfunction indexes except for range of motion of the low back. The indexes where the increase was statistically significant ($P < .05$) were cervical, thoracic, and low back tenderness, low back orthopedic testing, low back muscle weakness, and the neck disability index. An average of 5.4 of the 12 indexes were positive for the PMS group compared with 3.0 for the non-PMS group.

Conclusions: A relatively high incidence of spinal dysfunction exists in PMS sufferers compared with a comparable group of non-PMS sufferers. This is suggestive that spinal dysfunction could be a causative factor in PMS and that chiropractic manipulative therapy may offer an alternative therapeutic approach for PMS sufferers. (J Manipulative Physiol Ther 1999;22:216-20)

Key Indexing Terms: Premenstrual syndrome, spinal dysfunction, chiropractic, manipulation

INTRODUCTION

Premenstrual syndrome (PMS), also known as *late luteal phase dysphoric disorder*, describes a wide range of presenting signs and symptoms suffered during the premenstrual phase of the menstrual cycle.[1] Currently, PMS is regarded as a milder version of premenstrual dysphoric disorder (PMDD) for which research criteria has been included in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV).[2,3]

It is estimated that 10% to 20% of women of reproductive age experience severe or disabling symptoms, with up to 95% of such women experiencing some form of PMS.[4-6] More than 150 symptoms have been identified and include psychological problems such as irritability, mood changes anger, and depression, physical symptoms such as abdomi nal cramping, breast tenderness, low back pain, and head aches, and general joint pain, and behavioral changes, suc as food craving, insomnia, and loss of libido.[5] In the Unite States, figures suggest that approximately 5 million wome are affected by PMS and that at least $30 billion is lost in th total wage bill per year.[7]

There are many postulated causes and various treatme regimens that are used to manage PMS.[8] The major no chiropractic therapeutic intervention for PMS suffere involves a wide variety of drugs, as well as psychotherap vitamin supplements, diet control, exercises, and lifesty management. Several authors[4,9,10] have reviewed the ma therapeutic interventions and found them in general to ineffective when compared with placebo effects or to h undesirable side effects. Recent research[11,12] has indica that drugs such as fluoxetine (Prozac) and sertraline t affect serotonin activity and reuptake may be effective in treatment of PMS and PMDD.

Anecdotal evidence of the effectiveness of chiropra manipulative therapy in reducing the symptoms associa with PMS is abundant, but no clinical trials have been formed. Published case studies[13-16] offer some support the anecdotal evidence.

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Table 1. *Findings of spinal clinical findings*

	Clinical test	Description
1	History of spinal problems (Non-PMS related)	
2, 3, 4	Tenderness—cervical, thoracic, low back	Palpation facet joints, spinous processes, S/I joints
5, 6	Reduction or pain of movement—cervical, low back	Observation
7, 8	Presence of at least one positive orthopedic test result (a) cervical and (b) low back	Compression, max compression, upper limb tension test, straight leg raise, Nachlas, Yeoman's, Kemp's
9	Weakness in one or more low back muscles	Psoas, gluteal, adductors, tensor fasciae latae, piriformis, abdominals, hamstrings
10	Presence of a functional short leg	Prone or supine
11, 12	Revised Oswestry and NDI	

S/I, Sacroiliac.

Definition of PMS

The lack of a standard definition of PMS has hampered therapy and research of this syndrome. According to Reid[17,18] and Chihal,[9] to make a diagnosis of PMS the signs and symptoms must occur cyclically, particularly in the luteal phase (postovulation to premenstrual stage) of the menstrual cycle. Also, during the follicular phase (preovulation) there should be at least 7 symptom-free days in each cycle.

Diagnosis of PMS

There are no biologic markers for PMS, and the diagnosis is by necessity made on the basis of the history and particularly on prospective recording of signs and symptoms on a daily basis.[19,20] Retrospective evaluations have been found to be very unreliable,[21] whereas self-diagnosis has been estimated to be incorrect in up to 50% of patients.[9] Other disorders that may contribute to PMS symptoms and need to be ruled out before treatment for PMS include thyroid disease, mammary dysplasia, polycystic ovary syndrome, and galactorrhea.[6]

As part of a randomized clinical trial to determine the effectiveness of chiropractic treatment on PMS, this study measured the incidence of spinal dysfunction as determined from standard physical and chiropractic clinical examinations in a sample of PMS sufferers. This was compared with the incidence found in a matched sample of women with no PMS.

METHOD

Volunteers with premenstrual syndrome that responded to advertisements to participate in a clinical trial underwent an initial interview and examination. Each subject completed a modified Moos PMS Distress Questionnaire, a full history, physical examination, and spinal examination. The physical examination was conducted by a fully qualified medical practitioner, and the spinal examination by 1 of 2 fully qualified registered chiropractors with a minimum of 10 years experience. A total of 54 subjects were, as result of the initial interview, accepted into the study as having true PMS according to the DSM-IV[3] criteria and having no absolute contraindications to spinal manipulative therapy. This diagnosis was confirmed by daily monitoring of their PMS symptoms for at least two cycles before any intervention. A control group of 30 subjects recruited in a similar manner who did not suffer from PMS (according to the results of the modified Moos PMS Distress Questionnaire and self-diagnosis) underwent the same initial interview and examination as for the group of PMS sufferers but did not undergo the 2-month symptom monitoring. The examination of the control group was performed by the same examiners as for the PMS group with no blinding.

Table 2. *Subject characteristics*

	PMS ($n = 54$) (SD)	Non-PMS ($n = 30$) (SD)
Mean age (yrs)	35.7 (6.9)	34.4 (10.5)
Age range (yrs)	20-47	18-49
Cycle length (days)	28.0 (2.4)	27.3 (2.0)
Number of children	2.1 (1.5)	1.1 (1.4)
On contraceptive pill	11.1%	27.2%

SD, Standard deviation.

All subjects in both groups were of reproductive age with regular menstrual cycles. Subjects were excluded from the study if they had diagnosed gynecologic or psychiatric disorders, absolute contraindications to spinal manipulative therapy, or had undergone regular spinal manipulative therapy (more than 3 treatments) in the previous 6 months.

The spinal clinical tests performed on both groups are listed in Table 1. All subjects had no neurologic deficits or demonstrable or previously diagnosed disease.

Data Analysis

The data collected were entered into a spreadsheet, and contingency tables were created. The data were analyzed with chi-squared testing, with the statistical significance being set at $P < .05$. Two-tailed t tests for two samples assuming unequal variances were used to analyze data for both the revised Oswestry and Neck Disability Index (NDI).

RESULTS

The characteristics of the two groups are summarized in Table 2. There were no significant differences between the two groups for the variables listed.

Spinal History

A positive finding was recorded if the subject indicated that they had had any episode of a related spinal problem (such as neck, thoracic, or low back problems, headaches, and arm or leg pain) not related to PMS within the previous 2 years. The percentage of subjects in the PMS group with a previous history of non-PMS–related spinal problems was

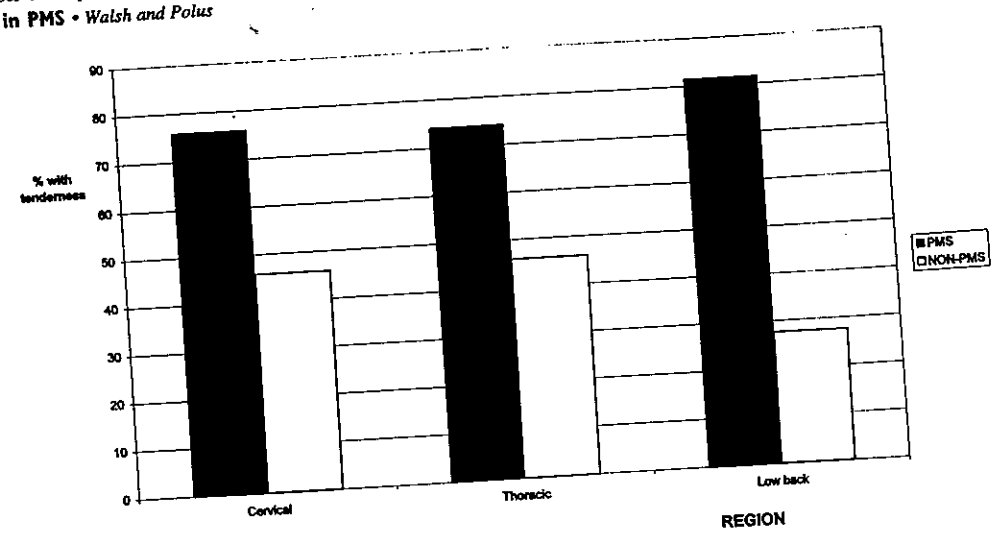

Fig 1. *Frequency of spinal tenderness by region.*

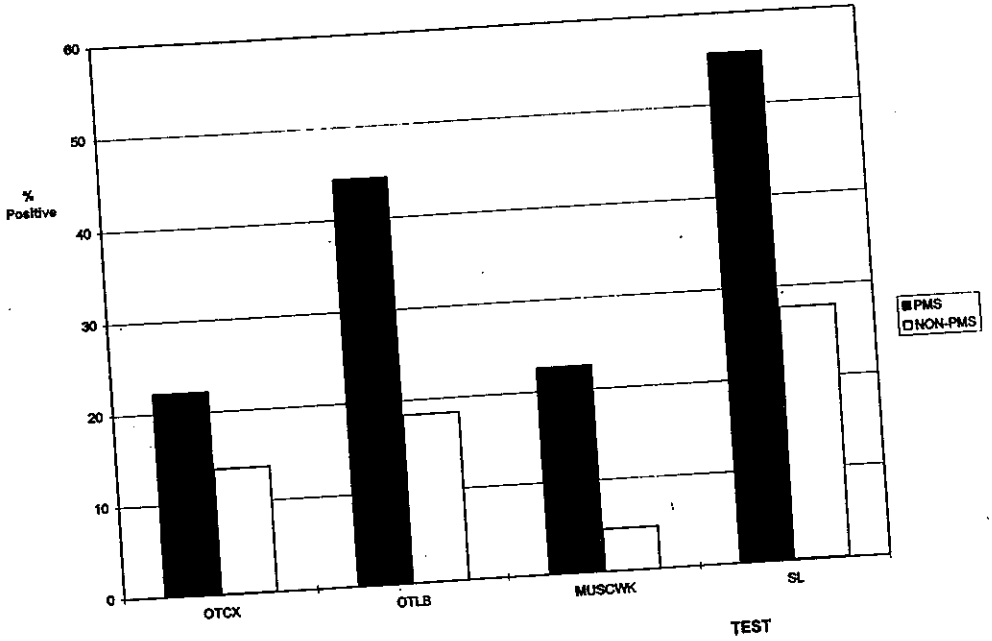

Fig 2. *Frequency of positive responses for orthopaedic tests, muscle weakness and short leg.* OTCX, *Cervical orthopedic test;* OTLB, *low back orthopedic test;* MUSCWK, *muscle weakness of the low back;* SL, *functional short leg.*

81.8% compared with 60.9% for the non-PMS group. A breakdown of conditions into cervical, low back, and headache showed that, for all conditions, the PMS group had a higher frequency of previous problems. However, there were no statistically significant differences between the 2 groups in all cases.

Spinal Tenderness

Spinal tenderness was measured by palpation of spinous processes, facet joints, and paraspinal musculature associated with each spinal motion segment. A positive finding was recorded for each spinal region (cervical, thoracic, and low back) if palpatory tenderness was found at any segmental level in the region.

Fig 1 indicates the percent of subjects in each group with spinal tenderness for the cervical, thoracic, and low back regions. For all three regions the PMS group displayed a statistically significant increase in the frequency of tenderness findings, particularly in the low back region ($P = .0001$).

Range of Motion

A positive finding was recorded if at least one of the planes of motion was decreased or painful in each of the cervical and low back regions. In the cervical region, 31.5% o the PMS group had reduced or painful motion compare with 22.3% in the non-PMS group, whereas in the low bac region the percentages of reduced or painful motion wer 20.8% and 22.8%, respectively. There was no statisticall

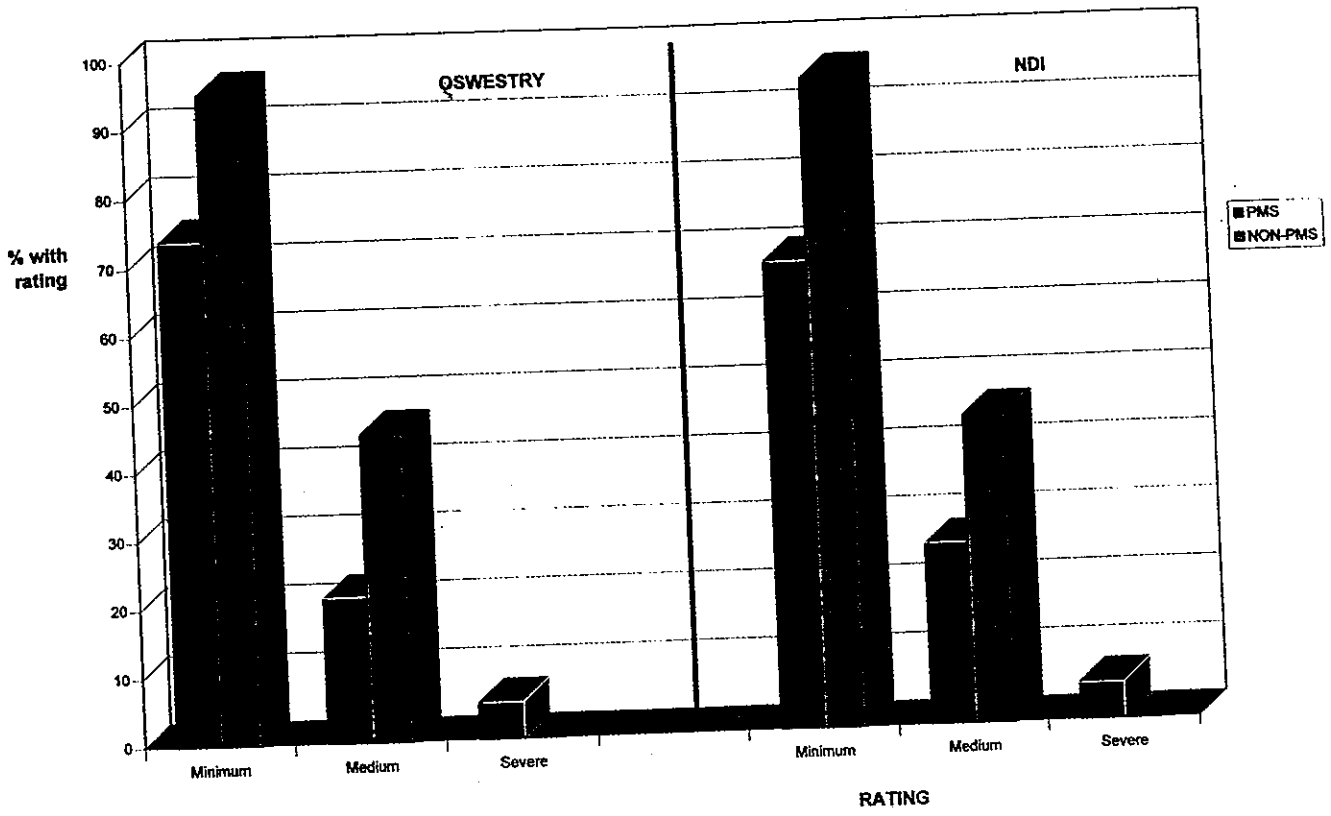

Fig 3. *Frequency of ratings for Oswestry and NDI.*

significant difference between the PMS and the non-PMS group in percent of subjects with decreased or painful motion for either region.

Orthopedic Testing, Muscle Weakness, and Leg Length Deficiency

Fig 2 shows the percent of subjects with a positive finding (as defined below) for cervical and low back orthopedic tests, muscle weakness of the low back, and functional short leg. For orthopedic tests a positive finding for each region overall was recorded if at least one of the tests listed for each of the regions examined (Table 1) elicited a painful response. For both the cervical and low back region, the PMS group showed a higher percent of positive findings, but only the orthopedic test results for the low back showed a significant difference between the two groups ($P = .031$).

When considering muscle testing of the low back, a positive finding was recorded when at least one of the tested muscles (Table 1) manually tested weak. A positive index for leg length deficiency was the presence of a functional short leg as observed with the patient in the prone and supine position. For both muscle weakness and short leg parameters, there was a significantly higher frequency of positive findings in the PMS group ($P = .046$ and $P = .043$, respectively).

Oswestry and NDI

The revised Oswestry Low-back Pain Disability questionnaire and NDI were used to assess functional disability in the low back and neck, respectively. The mean scores are shown in Table 3. For both the Oswestry and the NDI, the PMS group showed statistically higher mean scores than the non-PMS group ($P = .00011$ and $P = .00008$, respectively). The scores for each were rated as minimal (<20%), moderate (20% to 40%) or severe (40% to 60%). Fig 3 indicates the percentage of subjects in each group, with the above ratings indicating a tendency to severe ratings, with lower frequencies of minimum and moderate ratings for the PMS group compared with the non-PMS group. However, the differences in frequencies of ratings were only statistically significant for the NDI ($P = .0483$).

Table 3. *Mean scores for Oswestry and NDI questionnaires*

	Oswestry		NDI	
	Range	Mean (SD)	Range	Mean (SD)
PMS group ($n = 43$)	0-31	7.9 (8.0)	0-33	8.6 (7.3)
Non-PMS group ($n = 25$)	0-13	2.1 (3.1)	0-11	2.7 (3.7)

SD, Standard deviation.

DISCUSSION

The PMS group had a high percentage of positive responses for each of the spinal clinical findings assessed. Also, the frequency of positive responses was higher in the PMS group than the non-PMS group, except for range of motion of the low back. The findings where the increase was statistically significant ($P < .05$) were cervical, thoracic, and

low back tenderness, low back orthopedic testing, low back muscle weakness, and the NDI. An average of 5.4 of the 12 findings were positive for the PMS group compared with 3.0 for the non-PMS group.

Most studies indicate a low reliability of clinical tests.[22] Of the tests used, only spinal tenderness has some demonstrable reliability and validity.[23-25] Nonetheless, the tests used in this study would normally form part of a standard spinal examination done by most chiropractors in practice and are routinely taught in chiropractic colleges. These tests, among others, are used by chiropractors to identify regions of the spine where potential problems exist and to help locate areas where spinal manipulation would be given.

Thus it would appear that, in general, PMS sufferers are likely to have a high frequency of spinal clinical findings as measured by standard clinical examination procedures, and the level is higher than in a comparable group of women who do not suffer from PMS. We theorize that presence of positive spinal clinical findings could be an associated factor in PMS and that the correction of the underlying cause of the positive clinical findings, such as by chiropractic therapy, could reduce PMS symptoms. This warrants further investigation, and a clinical trial has recently been completed by us to assess the efficacy of chiropractic therapy on PMS.

Limitations of the Study

In any study examining data on clinical testing, there is always the problem with examiners not performing the tests or interpreting the patient responses in an identical way. Strender et al[26] suggest that the apparent low reliability of clinical tests is due to more to "the absence of 'standardization' of clinical tests." In this study only two examiners performed the tests, and all attempts were made to standardize procedures and interpretations. A major limitation when comparing the 2 groups is the lack of blinding of the examiners, thus introducing the possibility of examiner bias. The two disability questionnaires were completed by the subjects without examiner intervention and thus do not suffer from this bias to the same degree.

CONCLUSION

A number of positive spinal clinical findings exist in PMS sufferers, with the frequency of these tending to be higher than those observed in a comparable group of non-PMS sufferers. This is suggestive that the presence of positive spinal clinical findings may be an associated factor in PMS that warrants further investigation.

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