Study of Alleviating and Exacerbating Movement in Nurses with non Specific Chronic Low Back Pain: The Sahrmann's Approach

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This research was conducted to study of alleviating and exacerbating movement pattern and postures in nurses with non specific chronic low back pain. Study's population was 53 persons of woman nurses with non specific chronic low back pain. Assessment was done in 2 parts. The first part was consisting of questions about individual characteristics and another part was physical assessment based on Sahrmann's approach. Results show that standing and walking were exacerbating symptoms more than another position and supine lying and sitting were alleviating symptoms more than another position. In non-specific chronic low back pain we don't observe special pathology or disease. But repetitive movements and sustained postures affect musculoskeletal and neural tissue and induced musculoskeletal pain. Human movements are done in movement patterns. So, if we can identify and correct the positions that changed movement patterns we can restore optimal musculoskeletal health.

Key words: Movement pattern and posture, non specific chronic low back pain, lumbar assessment, movement impairment syndrome

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INTRODUCTION

Low Back Pain (LBP) is a substantial health problem that affects up to 80% of the adult population (Walker et al., 2004). Several classification systems have been proposed for subdividing non-specific LBP patients by means of clinical examination. In physiotherapy, these are of particular interest inasmuch as they (1) are sufficiently detailed to have implications for choice of treatment for the individual patient and (2) have been tested for reliability and validity (Delitto et al., 1995; Maluf et al., 2000). All three are treatment-oriented systems in that they place patients in categories with the purpose of determining an appropriate intervention. The classification process differentiates between specific spinal pathology, nerve root pain and simple or Non-Specific Low Back Pain (NSLBP) (Kent and Keating, 2005).

Most of the research organizations suggest more staging the problem based on the symptom duration into acute, sub acute or chronic (Spitzer et al., 1987; Bogduk and McGuirk, 2002). NSLBP represents about 85% of LBP patients seen in primary care (Deyo and Phillips, 1996) and the vast majority of LBP patients seen by physical therapists are classified under this group. The goal for the therapist managing LBP patients is to select the appropriate treatment for each patient. The clinical reasoning process required to achieve this goal starts with a diagnostic classification that place the patient into a recognizable group with a particular pattern of signs and symptoms. The medical professions in primary care most commonly classify these patients with pathoanatomically labeled categories. However, there appear to be a wide diversity in the opinion as to the patterns of signs and symptoms that constitute a category (Kent and Keating, 2003).

Disability related to LBP is a major problem in the Western World (Lebouf-Yde et al., 2003). Studies from a variety of countries investigating the long-term course of LBP show that most patients will improve rapidly (Pengel et al., 2002). Further improvement is apparent until about 3 months. Thereafter, levels for pain, disability and return to work remains almost constant. Six months after an episode, 60-70% of patients will have experienced relapses of pain and 16% will be sick-listed. As much as 62% will still be experiencing pain after 12 months (Pengel et al., 2002; Hestbaek et al., 2003). Nurses are among those professionals with the highest incidence rates of LBP (Kumar, 2004). Bending, twisting, lifting heavy weights and making forceful movements were shown to be related to LBP (Punnett et al., 1991). Combined lifting, prior injury and being overweight were found to be risk factors for WLBI among nurses (Fuortes et al., 1994).

Combatto et al. (2006) conducted a study on the differences in the pattern of hip and lumbopelvic motion between male and female with LBP. They have found male subjects exhibited a greater percent of maximum lumbopelvic rotation during the first stage of movement and had more LBP comparing to female. Van Dillen et al. (2003a, b) examined modifying patient-preferred movement and alignments of the lumbar spine during patient examination. They observed modifying the symptom-provoking movements and alignments of the spine during symptom testing resulted in a decrease in symptoms. Burnett et al. (2004) observed motor control and kinematics of lower lumbar spine in the LBP patients was differing from healthy patients. The purpose of present study was to determine the alleviating and exacerbating movement pattern and postures in nurses with non-specific chronic low back pain.

MATERIALS AND METHODS

Patients: A total 53 female nurses (men age of 33.75±5.86 years), with non-specific chronic low back pain participated in the study on the 2 years course from 2006 to 2008. Those subjects that had symptoms (pain or paresthesia) related to a low back problem in the region of the lower back, proximal lower extremity or distal lower extremity took participate in this study. Inclusion criteria were as follow: all of female nurses that work at least for one year and had LBP at least for one month. Those nurses that had pregnancy, severe kyphosis or scoliosis, spinal stenosis, a history of spinal surgery, cancer, rheumatoid arthritis, ankylosing spondylitis, neurological disease, disc herniation, inability to stand, walking without an assistive device and leg length discrepancy were excluded from the study.

The study was approved by the Ethics Committee of the Ahvaz Jondishapour University of Medical Sciences and all the participants read and signed an informed constant statement. For tests of alignment, the patient was asked to assume the test position for at least 10 sec and report if symptoms were increased, decreased or stayed the same (Maluf et al., 2000; VanDillen et al., 2005). For assessment, a trained physical therapist used a standard examination procedure. The positions and movements that assessed in subjects and percent of changing in symptoms were shown in Table 1 and 2.

Statistical and data analysis: after data collecting, they were coded and computer assisted analysis was performed. Descriptive statistics were calculated for patient characteristics (height, weight, age). Frequency
distributions of subject's responses (increased, decreased and same) were generated for each of the 15 tests. All analysis has been done using SPSS 13.0.

Table 1: Assessed positions and movements and related frequency distribution

<table>
<thead>
<tr>
<th>Positions</th>
<th>Same (24.5)</th>
<th>Increase (34.0)</th>
<th>Decrease (41.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting</td>
<td>13</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Forward flexion</td>
<td>26</td>
<td>39</td>
<td>11</td>
</tr>
<tr>
<td>Walking</td>
<td>21</td>
<td>36</td>
<td>1</td>
</tr>
<tr>
<td>Standing</td>
<td>47</td>
<td>46</td>
<td>1</td>
</tr>
<tr>
<td>Raising arms overhead</td>
<td>40</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>Sitting in lumbar extension</td>
<td>21</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>Back lying with legs extended</td>
<td>16</td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>Sitting with abdominal contraction</td>
<td>13</td>
<td>28</td>
<td>12</td>
</tr>
</tbody>
</table>

Values in brackets are shown percentage

Table 2: Assessed position and movements and related frequency distribution

<table>
<thead>
<tr>
<th>Positions</th>
<th>Yes (66.0)</th>
<th>No (34.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms are unilateral or more in one side?</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>Rotation increases symptoms?</td>
<td>30</td>
<td>23</td>
</tr>
<tr>
<td>Rotation with lumbar extension increases symptoms?</td>
<td>18</td>
<td>35</td>
</tr>
<tr>
<td>Move from supine to sit increases symptoms?</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>Move from sit to supine increases symptoms?</td>
<td>46</td>
<td>7</td>
</tr>
<tr>
<td>Move from sit to stand increases symptoms?</td>
<td>43</td>
<td>10</td>
</tr>
<tr>
<td>Move from stand to sit increases symptoms?</td>
<td>45</td>
<td>8</td>
</tr>
</tbody>
</table>

Values in brackets are shown percentage

**RESULTS**

In this study 53 female nurses with non specific chronic low back pain were participate. The mean of their demographic data include: for age was 33.75±5.86 year, for height was 160.58±6.79 cm and in case of weight was 63.51±10.58 kg. Results from frequency distributions showed standing and walking more than another positions exacerbating symptoms lying and sitting more than another positions alleviating symptoms. Assessed positions and movements and percent of their symptoms were as follow; 41.5% of subjects were better with sitting, 34% had increased symptoms and 24.5% of subjects didn’t show any change in their symptoms with this position. 22.6% of subjects were better with forward flexion, (Fig. 1A) 28.3% had increased symptoms and 49.1% didn’t report any change with this position.

Walking, was increased symptoms in 58.5% of subjects, but didn’t change symptoms in 39.6% of subjects. Only one person (1.9%) was better with walking. 92.5% of nurses reported that their symptoms were exacerbated with standing (Fig. 1B) and in 7.5%, standing

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**Fig. 1:** (A) Forward flexion, (B) standing position, (C) raising hands over head (D) sitting with extension in lumbar spine, (E) back lying with legs extended and (F) sitting with abdominal muscle contraction
didn’t change their symptoms. The 9.4% of subjects were
to be long-lasting in nature, varying in

standing position and 15.1% had

improvements in lifting devices, biomechanical training,
bigger rooms, adequate set-up and additional staff.

Sitting with abdominal muscle contraction (Fig. 1F)
was increased symptoms in 52.8% of subjects, 22.6% were
better in this position and 24.5% didn’t change in their
symptoms. The symptoms were unilateral or more in one
side in 34% of subjects and 66% had bilateral symptoms.
Lumbar rotation increased symptoms in 43.4% of subjects
but 56.6% hadn’t change in their symptoms with rotation.
Lumbar extension with rotation was exacerbated
symptoms in 66% and didn’t change symptoms in 34% of
subjects. 49.1% of subjects reported their symptoms were
increased with supine to sit position and 50.9% hadn’t
change in their symptoms. Sitting to supine position
didn’t change symptoms in 86.8% of subjects and 13.2%
have pain with this change position? Sit to stand position
didn’t change symptoms in 81.1% of subjects and 18.9%
had pain with this change position. 84.9% of subjects
reported their symptoms didn’t change with stand to sit
position and 15.1% had increased symptoms (Table 1, 2).

DISCUSSION

Standing and walking were exacerbating symptoms
more than another positions, these patients often report
occasion flare ups in their symptoms. Patients who have
such a clinical picture are patients who may repeatedly
stress tissue in lumbar region in specific direction as a
result of movement and alignment strategies that they are
performing continually throughout their day. As a result
symptoms appear to be long-lasting in nature, varying in
intensity across time with regular activities, with
occasional distinct flare-ups often associated with an
increase or change in regular activity levels.

Winter somewhere et al. (2004) in a research work on patient
with low back pain and lower-extremity injuries showed
that passive and active stretching are equally effective for
increasing range of motion, presumably due to increased
flexibility of tight hip flexor muscles. Vieira et al. (2006)
conducted a study on the hospital injury records were
examined in a retrospective study as well as a validated
questionnaire was administered to 47 nurses. Their
methodology proposed for job evaluation and to design
a participatory ergonomic intervention aiming at reducing
low back injuries in nursing jobs. They suggested

present finding approach is based on Sahrmann’s
approach that people develop to more spines in a specific
direction as the result of performing movements and
assuming, sustained positions repeatedly during their
everyday activities. Present findings aren’t unexpected
based on Sahrmann’s approach, because nurses do most
of their work activities at standing position or walking, so,
this sustained postures and repeated movements that
they had on their daily activities, may be contributing to
the patient’s LBP.

If movements have done at the optimal kinesiologic
standard position, tissue damage doesn’t occur
(Van Dillen et al., 2003a, b). Human movements involve
similar internal and external forces, as do mechanical
systems. In mechanical systems, maintaining precise
movement is important (Norton et al., 2004). The effect of
repeated movements and sustained postures modify the
kinesiologic model so that it becomes a kinesiopathologic
model. The best method for muscle testing is clinical
observation and observational assessment (Bullock et al.,
2000). Observation and measurement of osteokinematic
movements are part of standard assessment that
physiotherapist does (Sahrman, 2005). Reproducible
movements of the spine or extremities can produce the
symptoms that elicit stress or movement. The site of the
symptoms is particularly susceptible to movement
because it becomes more flexible than the other sites of
which motion also occurs. This susceptibility to
movement further exaggerates the flexibility of the site
because it is repeatedly subjected to motion. Most
movements involve the participation of multiple segments
and the relative contribution of each segment is a
function of its mechanical characteristics. Thus most
spine dysfunction occurs because of excessive relative
flexibility, particularly at specific segments, rather than at
the segment of reduced flexibility. The reduce flexibility of
some segments invariability contributes to compensatory
motion at the most flexible segments most often back pain
subsides without direct treatment to the spine itself. After
the correction is made, the spine is no longer subjected to
the traumatic stresses.

CONCLUSION

In conclusion, given the focus on reducing LBP in
nursing population in the work place have been relatively
ineffective. Perhaps the emphasis should shift toward
identifying factors associated with LBP and developing
targeted early interventions by eliminating predisposing
factors. Chronic unspecified low back pain is possible to
clearly be classified physically in nursing population.
This functional classification is necessary to aid decision
making us to which specific conservative approach such as physical therapy, should be used. There is conflicting evidence regarding the efficacy of physical therapy for patients with chronic low-back pain. When used combined with spinal manipulation, exercise and other co-interventions, it may improve chronic low-back pain and disability.

REFERENCES


