Sitting Posture of Subjects With Postural Backache

Lauren Womersley, MSc,[a] and Stephen May, BSc[b]

Abstract

Objective: To test the construct validity of postural backache. To identify if individuals with backache sit for longer periods of sustained sitting and have more flexed relaxed sitting posture than individuals in a no backache group.

Methods: Following an initial questionnaire, student volunteers without a history of 'serious' back pain were classified as either postural backache group or no backache group. With the use of an activity diary that plotted activity every 5 minutes over a 3-day period, the average time spent in different postures was established. Relaxed sitting posture was evaluated using Dartfish software to analyze videotape after 10 minutes of sitting.

Results: The most common daytime activity of both groups was sitting, with average sitting time not significantly different between groups. Periods of uninterrupted sustained sitting and uninterrupted sustained studying were significantly longer, and the degree of flexion in relaxed sitting was significantly greater in the postural backache group (all $P < .024$).

Conclusion: In a group of student volunteers, half reported postural backache. The group with backache sat for longer periods without interruption and had a more flexed relaxed sitting posture than the no backache group. These findings appear to validate McKenzie's concept of a postural syndrome. (J Manipulative Physiol Ther 2006;29:213-218)

Key Indexing Terms: *Back Pain; Posture; McKenzie; Postural Syndrome*

The subclassification of the nonspecific low back pain population has been deemed a vital area of research, as it is suggested that subclassification before treatment will lead to more effective treatment.[1] However, a number of classification systems exist.[2-4] A classification system that is commonly used and has been tested for reliability and validity is that proposed by McKenzie.[2-5] In this classification system, it is proposed that most patients will be categorized as derangement, with fewer numbers being categorized as having dysfunction or postural syndrome.[5,6] A considerable amount of literature has examined concepts and clinical phenomena associated with the derangement syndrome, summarized in 3 recent reviews.[7-9] However, there is little published work examining the validity of the postural syndrome.

The link between sustained sitting postures and back pain is controversial. One systematic review failed to find evidence to support an association between back pain and sitting while at work.[10] Nachemson and Vingard[11] reviewed the literature and failed to find a convincing link between posture and back pain. However, reviews of the optimal sitting posture suggest that a mixture of maintaining lordosis plus moving at regular intervals is best for the back.[12,13] Several studies suggest that sitting frequently aggravates back pain once present, but very rarely eases it.[14-17] The effect of lordotic and kyphotic sitting postures on back and leg pain in those with established symptoms has been shown to be very different in altering pain site and pain intensity.[18]

Several studies suggest that for long periods of sitting, more flexed postures are less comfortable than more extended postures and are more likely to provoke discomfort.[19-22] These are mostly descriptive studies with weak study designs that do not accurately define the parameters of posture and time of those who reported the symptoms. To our knowledge, no study has compared variables that may affect the development of symptoms in backache and nonbackache groups.

McKenzie and May[6] wrote, "Postural syndrome is a painful disorder caused by prolonged static loading of normal soft tissues continued until the point when mechanical stress triggers discomfort." Postural syndrome differs markedly from the other mechanical syndromes, in that symptoms are transient and there is no persisting impairment or disability. It is claimed that many experience

[a] Faculty Health and Wellbeing, Sheffield Hallam University, Broomhall Road, Sheffield, UK.
[b] Faculty Health and Wellbeing, Sheffield Hallam University, Broomhall Road, Sheffield, UK.

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Dr Womerley's present address is Bradford Teaching Hospitals NHS Trust, St Luke's Hospital, Little Horton Lane, BD5 0NA Bradford, UK.

Submit requests for reprints to: Stephen May, BSc, Faculty Health and Wellbeing, Sheffield Hallam University, Broomhall Road, Sheffield, UK (e-mail: *s.may@shu.ac.uk*).

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- Spinal pain only, and
- concordant pain only with static loading, and
- abolition of pain with postural correction, and
- no pain with repeated movements, and
- no loss of range of movement, and
- no pain during movement

Fig 1. *Operational definitions for postural syndrome from McKenzie and May.*[6]

postural backache especially during prolonged sitting, but because symptoms are transient and quickly abolished once the upright posture is resumed, individuals rarely seek treatment.[5,6] The clinical presentation is usually a young person who spends a lot of time in a sitting position and leads a generally sedentary lifestyle; they have a poor sitting posture, and if sustained sitting is performed, symptoms will be provoked. These symptoms abate once posture correction is performed or the upright posture assumed, and the rest of the physical examination is unremarkable.[5,6] Fig 1 provides operational definitions of postural syndrome.

Although anecdotal evidence may support the existence of such a clinical presentation, no published reports exist to substantiate a link between poor posture and sustained sitting and postural backache. The aims of the study are to determine if there is a link between postural backache and time of sustained sitting and flexion angle in relaxed sitting. We hypothesized that (1) individuals with postural backache would sit for longer periods of sustained sitting than those in the no backache group, and (2) individuals with postural backache would have a more flexed relaxed sitting posture than those in the no backache group.

Methods

The process by which data was gathered went through several stages: recruitment, screening, assignment to case or control group, monitoring weekly activities by posture, checking group assignment, and measuring the lumbar spine in relaxed sitting posture (Fig 2).

Subjects

Subjects were volunteers from the first year physiotherapy course at Sheffield Hallam University, UK. All individuals consented to participate and local university ethical procedures were followed. It was considered that this group would be more likely to suffer from transient rather than serious backache because of their age and would also be relatively naive about any link between posture and backache as they were at the beginning of the course.

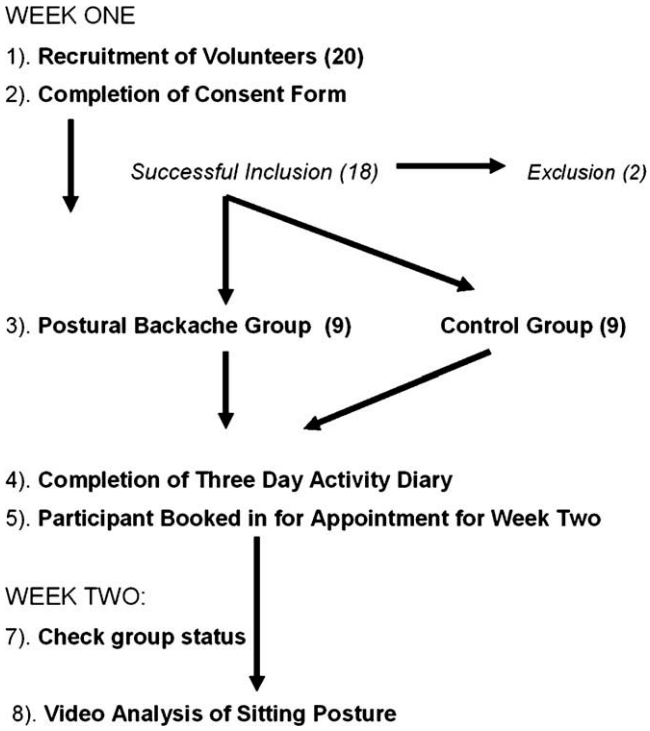

Fig 2. *Diagram of research process.*

Inclusion and exclusion criteria were detailed for backache and no backache groups as below.

Twenty students volunteered to participate, and according to their response to an initial questionnaire that asked about backache, individuals were allocated to 1 of 2 groups. Group 1 was the postural backache group (n = 9). Those in this group had a history of mild backache (defined as 5 or less on a pain visual analogue scale), no trauma to the back, no treatment for backache, and no functional disability due to backache. Those in the no backache group (n = 9) had no history of any backache, no trauma to the back, and no treatment for backache. After responses to initial questionnaire, 2 volunteers were excluded: one due to trauma from a recent road accident, and another had some functional disability from backache. The 2 groups were very similar regarding age, gender distribution, height, and weight (Table 1).

Monitoring Weekly Activity

The aim of this component of the study was to monitor the normal postural activities of the participants over a 3-day period, including 1 weekend day. An activity diary was used to monitor activity; this was adapted from Bouchard et al.[23] The following adaptations, with reasons, were made to the original diaries: 5-minute intervals, rather than 15-minute intervals, were used for a more accurate monitoring of activity; categorization was altered so there was more emphasis on activity rather than energy expenditure; the layout and accompanying instructions were also