Reviewer's report

Title: Regional differences in lumbar spinal posture and the influence of low back pain

Version: 1 Date: 16 April 2008

Reviewer: Jaap van Dieën

Reviewer's report:

general comments

The authors have studied the lower and upper sagittal plane angles in sitting and standing and a number of other postures and tasks in a large cohort of young female subjects. They provide relevant data, specifically regarding the lack of correlation between upper and lower lumbar angles. This finding clearly supports and extends previous literature that indicates that to make inferences on spinal tissue loading, upper and lower lumbar kinematics need to be regarded separately. In addition, the authors have studied the effect of low-back pain, with several case definitions, on these angles, on the relationship between upper and lower lumbar angles and on the relationship between lower lumbar angles across tasks/postures. While no group differences (effects of low-back pain) on the angles and on the relationship between upper and lower angles were found, a group difference in the relationship between the lower lumbar angle in sitting to the lower lumbar angle in other tasks was found. From a comparison of the coefficients of correlation, it was concluded that this relationship is more consistent in the group without low-back pain than in the group with severe low-back pain or with low-back pain related to sitting. The latter conclusion is, in my view, not very convincing. The data presented in figure 3 indicate that the variance in angles is larger in the control group than among cases. Hence, the difference in the coefficient of correlation may reflect a difference in within-group variances of angles rather than a difference in consistency (the within-group covariance). It would appear that mean absolute residuals are not very different for example. An alternative interpretation could be that in the low-back pain group extreme angles are avoided. This doesn’t affect the mean, but does affect the within-group variance. The statistical analysis could be improved and perhaps expanded to provide a more thorough understanding of this interesting data set.

specific comments

The sitting and standing postures are defined as ‘usual’. It seems debatable whether subjects truly adopt their usual posture in the presence of a researcher whom they know to be interested in posture and low-back pain, certainly given the short measurement duration. The terminology needs to be adjusted and this point merits discussion.

In the description of the functional tasks under point 3, ‘the box’ should be ‘the
ICC and SEM are reported for the lower lumbar angle. Please, add similar information for the upper and total lumbar angle.

Why weren’t the tests performed in one ANOVA with low-back pain group, upper vs lower, and posture/task as factors? This would avoid some repeated testing and might give a more clear interpretation of the results. The differences in within-group variances may be a point of concern in the statistical analysis.

In the results section: ‘The Lx sagittal’ should probably be ‘The TLx sagittal’. Please repeat briefly here how motion (better range of motion) was defined, between which tasks.

figure 3: Please use same axes for left and right panels to facilitate comparison.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests