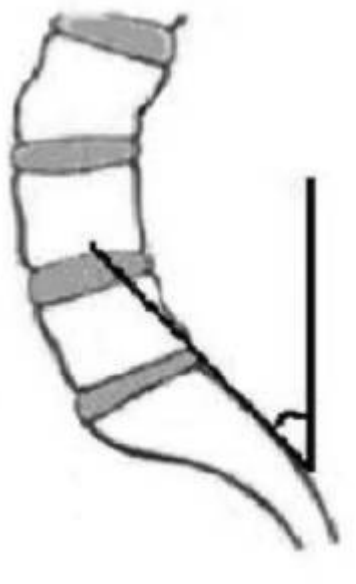
The sacral inclination (SI): value of the angle between the posterior side of the body of the first sacral vertebra and the vertical.



Measurements of the curvature of the lumbar spine are useful in the investigations of low back pain. It is unclear whether the degree of lumbar lordosis, sacral inclination and lumbosacral angulation are the same for all normal adults. Radiographic studies were carried out on the lumbar spines of subjects aged 9-61 years. Mean and 95% tolerance ranges of the values of lumbar lordosis, lumbosacral angle and sacral inclination for adult age groups up to the sixth decade are given. The results showed that all three parameters varied steadily with age. The pattern of changes differed in males and females. Females had greater angles than males. Sacral inclination appeared to be a more important determinant of the degree of lumbar lordosis. All three parameters showed a tendency to decrease after the sixth decade [1)]

In patients with low back pain (LBP) the position of the pelvis is often a focus of physical or manual therapy. The “gold standard” to determine sacral inclination is by radiograph, but methods to measure sacral inclination externally with an inclinometer have also been introduced.

To determine the validity of the inclinometer in measuring the sacral inclination in patients with LBP.

Adult patients with LBP who were referred by the general practitioner to the hospital for radiograph examination of the lumbosacral spine were included.

Measurement of sacral inclination acquired with the inclinometer, simultaneous with the x-ray exposure, was compared with the “gold standard” measurement of sacral inclination on the radiograph. Regression analysis was used to define the measurement error.

Of 50 consecutive patients with LBP, radiographs of 41 patients were useful for the required measurements on the radiograph. The mean difference between the radiographic and inclinometer method was 23.12 degrees. The measurement error was 8.26 degrees. Regression analyses showed poor correlation between both methods (r = 0.28).

The method we used to measure sacral inclination with an inclinometer proved to be invalid [2)].

1)

Amonoo-Kuofi HS. Changes in the lumbosacral angle, sacral inclination and the curvature of the lumbar spine during aging. Acta Anat (Basel). 1992;145(4):373-7. PubMed PMID: 10457779.
2)
Bierma-Zeinstra SM, van Gool JJ, Bernsen RM, Njoo KH. Measuring the sacral inclination angle in clinical practice: is there an alternative to radiographs? J Manipulative Physiol Ther. 2001 Oct;24(8):505-8. PubMed PMID: 11677549.