

통증 및 근골격재활

발표일시 및 장소 : 10 월 26 일(금) 15:03-15:15 Room E(5F)

## OP- Scientific 2-5

### Optimal seatback reclining angle for preservation of lumbar lordosis at driving posture

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#### Objective

Optimal seatback angles for automobile drivers' seats have been investigated based on comfort and back muscle activities; however, radiology supported evidences are scarce. The aim of this study was to evaluate optimal range of the seatback reclining regarding torso angles for an automobile driver's seat to preserve lumbar lordosis.

#### Materials and Method

A total of 60 healthy volunteers were recruited among various body type categories across 4 ethnicity groups. A mock-up carseat was created with the carseat that is used in a commercial vehicle, with a steering wheel to resemble real driving posture. Lateral lumbar spine X-rays were obtained for the neutral sitting posture without seatback as a reference, and for the sitting posture in the carseat leaning against the seatback with the hands on the handle (Fig. 1), at torso reclining angles of 25 to 31 degrees by 2 degree intervals. The Cobb angles for the L1-L4, L4-S1, and L1-S1 segments were measured.

#### Results

The Cobb angle for L4-S1 was nearest to the reference ( $20.23 \pm 1.05^\circ$ , mean  $\pm$  standard error mean) at torso reclining angles of 29 and 31 degrees ( $19.86 \pm 1.10^\circ$  and  $20.25 \pm 2.18^\circ$ , respectively, Fig. 2). The Cobb angle at L4-S1 between reclining angles of 27 deg ( $18.67 \pm 1.08^\circ$ ) and 29 deg ( $19.86 \pm 1.10^\circ$ ) were significantly different ( $p < 0.001$ , paired t test). The reclining angle of 29 deg was determined the most optimal reclining angle for most subgroups for the factors including height, BMI, and ethnicity; however, the subgroup with short height demonstrated that the torso reclining angle of 25° is most optimal posture. Morbidly obese people (body mass index  $> 31.0$ ) showed higher L4-S1 angle in neutral sitting posture, but the range of the Cobb's angle was predominantly decreased when seating in a carseat while the optimal torso reclining angle was still 29 deg.

## Conclusion

Torso reclining angles of 29 to 31 degrees revealed to be optimal for preserving lordosis at the L4-S1 segment. The Results of this study may serve as an individualized healthcare-related guideline for driver's seat adjustment settings.



Fig1. The mock-up carseat with a steering wheel is set up in the x-ray room for lateral x-ray acquisition.

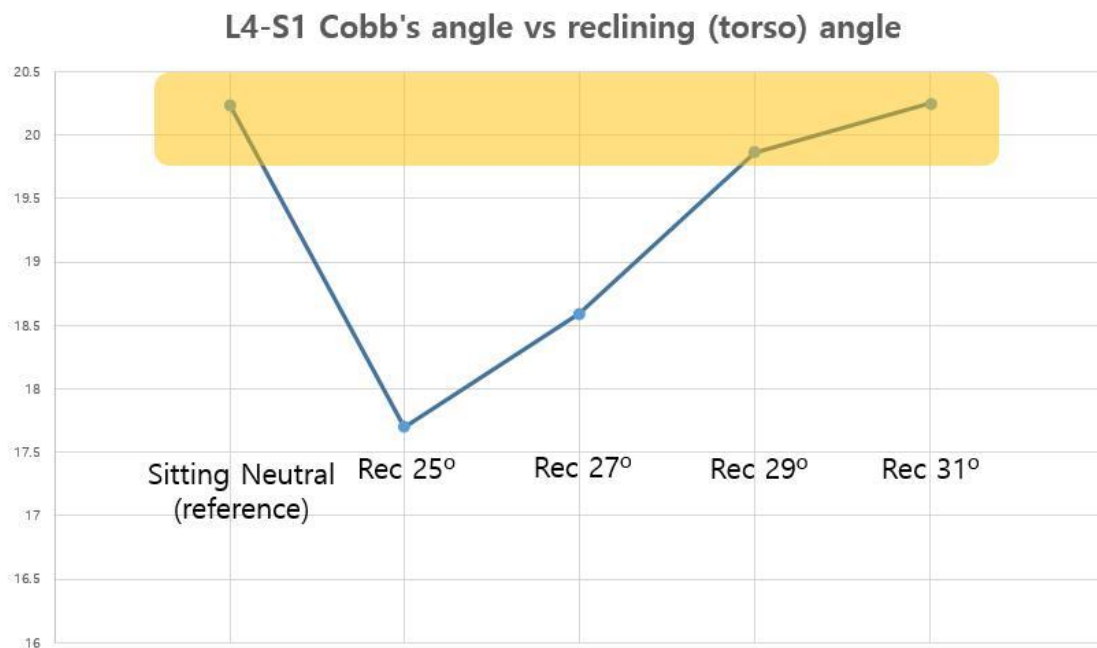


Fig2. The Cobb's angle for L4-S1 segment is nearest to the reference posture at torso reclining angles of 29 and 31 degrees, suggestive of optimal reclining angles.