Is the intercrestal line higher in pregnancy?

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Background: Correct identification of vertebral levels is important to avoid trauma to the spinal cord during neuraxial anesthesia. In adults, the spinal cord terminates at L1. Broadbent et al showed that in 19/100 subjects, the spinal cord terminated below L1. In non-pregnant women, the intercrestal (IC) line crosses the vertebral column at L 4-5. In pregnant women, the IC line may be higher in relation to the vertebral axis, which might lead to inaccurate estimation of interspaces. The aim of this study was US identification of the level of the IC line during pregnancy, and to make comparisons with the levels identified clinically.

Methods: After IRB approval, term pregnant patients were enrolled prior to cesarean or vaginal delivery. Exclusion criteria were BMI >40, spine surgery, or spinal deformities.

Two anesthesiologists marked the estimated level of the IC line with the patient sitting, trunk flexed. Each was blinded to the other’s mark. Another anesthesiologist, who was also blinded to the marks, scanned the lumbar area and marked the L1 to L5 levels in the flexed position. The level of the iliac crest was determined by US. Following this, the marks were uncovered and the levels at which the IC line were found clinically, were compared with the level determined by US.

Results: Seventeen patients were studied. The iliac crest was found at L4 in 43.7%, L4-5 in 12.5%, L3-4 in 18.7%, and above L3 in 25% of patients. The first clinical estimate agreed with US determination 12.5 %, was 1 level higher 25 % and more than one level higher 43.7% of the time. Clinical estimates correlated well (r= 0.72; p< 0.001). On average, clinical estimates were higher than US determination (p= 0.001). BMI had no correlation with US or clinical estimate of the IC level.

Conclusion: Use of the IC line may be an unreliable method of detecting spinal levels. Several studies have shown that clinicians are frequently incorrect and tend to go to a higher interspace than intended. Two studies showed a difference between palpation and US estimation of lumbar interspaces. However, both were performed postpartum, where there are anatomical changes from during pregnancy.

In non-pregnant patients, the IC line by X ray, coincided with L4 or L4-5 in 78.6% of patients but was as high as L3-4 in 3.7% of cases. In our sample, we determined the IC line by US to be above L3 in 25 % of cases. Movement of the IC line in pregnancy may be secondary to accentuation of the lumbar lordosis and difficulty flexing the spine.

US has been shown to be more accurate than palpation in correctly identifying lumbar interspaces, however it is impractical to scan all patients prior to neuraxial block. This was a pilot study and the small sample size limits the conclusions that can be drawn. However, our results suggest that in a significant proportion of pregnant women, the IC line may be at a higher level than expected, and caution should be observed during neuraxial block.