Ultrasound imaging of the obstetric epidural space: validation of a training programme

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Background and aim: Epidural ultrasound training is becoming an important part of obstetric anesthesia. There is a need for standardized training programs. We aimed to develop and validate such an epidural ultrasound training programme.

Methods: The trial was performed on trainees who participated in two formal epidural workshops. They were randomized to either a standardized training group or basic training group. The standardized epidural ultrasound training session included a 10 minute narrated presentation and 15 minute demonstration. The technique was taught via a step-by-step approach that included “10 easy steps to performing epidural ultrasound”. The basic training session was a hands-on training session, teaching epidural ultrasound systematically, but without mentioning the 10 step checklist.

Prior to assessment an expert marked three lumbar interspaces and ideal insertion point with an UV marker. The distance form the skin to the ligamentum flavum-duramater complex was measured. A 5mm distance from the expert were the competency benchmark used for measurements. A transparent dressing was applied over the area. Each trainee then performed three randomly allocated epidural ultrasound scans on a pregnant participant. Markings were done on the dressing. The participants were expected to complete each scan within 6 minutes. Feedback was given after each scan. The trainees were videotaped whilst performing their tasks.

The video clips and images are being analyzed by two blinded international experts. They are using the epidural ultrasound checklist and 5-point Global Rating Scale to evaluate the performance of the trainees.

Results: At present only preliminary results from the checklist as evaluated by a workshop presenter is available. There were 9 participants each in the standardized and control group. Using Two-way ANOVA testing at a 0.05 significance level for a difference between the two workshops, the null hypothesis was not rejected because $F = 1.86 < Fu = 2.27$ and $p = 0.1$. There is insufficient evidence of a difference between the two workshops in terms of improving checklist scores for trainees performing epidural ultrasound.

Discussion: Epidural ultrasound is an advanced ultrasound technique. Six scans per participant are probably insufficient to show a difference in effectiveness between the different training sessions. However, objective assessment might result in a more unbiased and different final result and conclusion.

Additional File:
Figure 1: 1) Standardized learning session 2) Expert marking ideal needle insertion point with UV marker
3) Trainee black pen marking of ideal insertion point on transparent adhesive in relation to expert UV light illuminated marking
4) Assessment videotaped