Utilisation of pre-procedural spinal ultrasonography in a tertiary obstetric unit

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Introduction

Central neuraxial blocks (CNBs) are widely used in obstetric anaesthesia and have traditionally been performed using the surface landmark approach, with endpoints such as loss of resistance on needle puncture or visualisation of cerebrospinal fluid flow. However, drawbacks of this technique include a variable location of Tuffier's (intercristal) line and a growing patient population with difficult-to-palpate surface anatomy, such as those with a high body mass index or previous back surgery.

Pre-procedural spinal ultrasonography (PSU) is an invaluable adjunct that can be used to overcome these limitations. Its use allows for more accurate identification of the midline and the desired vertebral level, in addition to providing an estimate of the spinal space depth. Besides reducing the number of insertion attempts and therefore increasing overall patient satisfaction [1], PSU could reduce the incidence of complications such as accidental dural puncture, the long-term morbidity of which has been highlighted by recent studies [2].

The aim of this study was to examine our current practice of PSU in a busy tertiary obstetric unit in London.

Methods

A survey questionnaire on Google Forms was sent to:

1. All anaesthetic consultants with regular obstetric sessions at UCLH.
2. All anaesthetic trainees/clinical fellows on the on-call rota at UCLH.

The questions related to:

1. Reasons for, frequency of, and training received in the use of PSU.
2. Confidence level in using PSU for patients with abnormal spinal anatomy and impalpable surface landmark (visual analogue scale of 0 to 10).

All responses were anonymised and downloaded onto an Excel spreadsheet for data analysis. Ethical approval was not required.

Changes arising from this study

Since this survey, our unit has:

1. Ordered hand-held spinal ultrasound devices (Accuro) to improve feasibility of use, particularly for epidural insertions in labour rooms.
2. Set up well-received regular local training sessions for trainees/clinical fellows.
3. Encouraged PSU use during elective caesarean delivery to increase experience and exposure.

Results/Discussion

A total of 30 responses were collated; this included 12 consultants with regular obstetric sessions (12/13) and 18 trainees/clinical fellows (18/27). The results are summarised in **Table 2**. The most common reason listed for PSU use was high BMI, followed by spinal deformity and previous spinal surgery **[Table 1]**. Both consultants (92%) and trainees (78%) are keen on using PSU when faced with predictably difficult spinal anatomy or after a failed attempt with the surface landmark approach **[Table 2 & Figure 1]**. However, only five (42%) consultants and two (11%) trainees routinely perform PSU for elective caesarean delivery **[Table 2 & Figure 1]**. Utilisation level is even lower for emergency cases (3 consultants and 0 trainees) despite a high confidence level of and training received in PSU use amongst consultants **[Table 2]**. The reluctance of training grade anaesthetists in using PSU in emergency cases is particularly important as they often manage difficult neuraxial blocks out-of-hours without direct supervision, and greater adoption of PSU by this cohort could improve quality of care.

Reasons FOR using PSU	Reasons AGAINST using PSU
High BMI	Lack of confidence
Low BMI	Lack of training/don't know how to perform
Spinal deformity (e.g. scoliosis)	Time constraints
Previous spinal surgery/metalwork in spine	Non-portable US machine
Failed landmark technique	'Better without'

Table 1. Reasons for and against PSU use given by anaesthetic consultants and trainees/clinical fellows at UCLH.

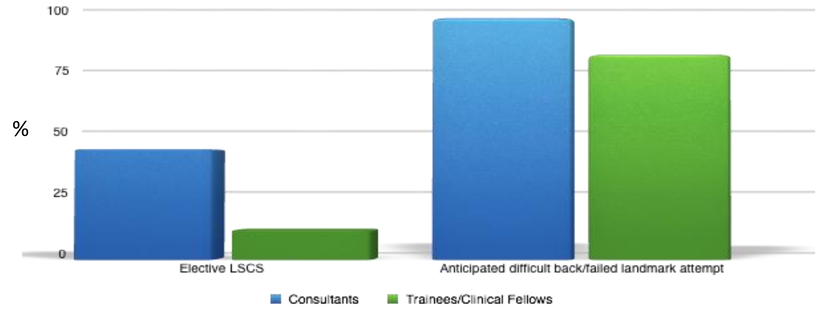


Figure 1. Comparison of PSU use in elective caesarean delivery and anticipated difficult cases between anaesthetic consultants and trainees/clinical fellows at UCLH.

	Consultants	Trainees/ Clinical Fellows
Response rate (%)	12/13 (92)	18/27 (67)
Routine use - Elective LSCS (%)	5/12 (42)	2/18 (11)
Anticipated difficult back/failed landmark technique (%)	11/12 (92)	14/18 (78)
Use for emergencies (%)	3/12 (25)	0/12 (0)
Confidence level in PSU when impalpable landmarks (0-10)	8	5
Confidence level in PSU when abnormal spinal anatomy (0-10)	7	4
Training received (%)	12/12 (100)	14/18 (78)

Table 2. Frequency of PSU use in addition to confidence level and training received by anaesthetic consultants and trainees/clinical fellows at UCLH.

References

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