Author's response to reviews

Title: The effect of anaesthetist grade and frequency of insertion on epidural failure: a service evaluation in a United Kingdom teaching hospital.

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Version: 2 Date: 13 November 2014

Author's response to reviews: see over
Editorial comment:

“Please confirm whether informed consent was obtained from the participants in your study and include a statement to this effect in your manuscript. In the event that the requirement for informed consent was waived by your ethics committee due to the service evaluation nature of your study, we would still request that a statement detailing this be included in your manuscript.”

The chair of the local ethics committee has confirmed that informed consent was not required from the participants in the study, and a statement confirming this has been added to the manuscript.

Reviewer 1:

“The authors should perhaps broaden the picture and acknowledge that this may be not simply a technical issue. The predictors of postop pain are psychological - depression, anxiety, catastrophizing and preop pain. Pain is inversely correlated with age.

Ideally a regression model would identify markers but my own modeling of routinely collected data identified only 60% of the variability. The other 40% is unaccounted for and the authors make a contribution to that. However, without genetics analysis and psychologicaal profiling of patients we are unable to quantify the effect of clinical experience.”
We agree with Dr Mcleod that non-technical factors may impact upon the presence and severity of postoperative pain, and have added a statement to this effect within the discussion section. However, our study was not designed to assess the effect of psychological or genetic factors on the success or failure of epidural analgesia.

“What makes our efficacy better?—do we know what sort of experience the groups have had in their lifetime I would bet there was a difference between consultants.”

Unfortunately, due to the nature of the data available to us, all we know is the grade of the anaesthetist inserting the epidural catheter, rather than the prior experience. We agree that individual anaesthetists within these broad groupings may have differing levels of training and ongoing practice, but we do not have consent from individual anaesthetists to publish individual performance figures.

“Does seeing the patient postop and the next day make a difference? I reckon yes because it provides feedback and consciously or unconsciously alters approach and practice.”

Dr Mcleod may very well be correct, and appropriate follow-up of patients is an important part of anaesthetic practice. However, this study was unable to assess this, and the data were collected by acute pain nurses rather than individual anaesthetists. All patients were reviewed daily by the acute pain team.

“How should we be training this and other blocks?”

This is a pertinent question, but we did not set out to address it in this study.

“There is a bit of an argument about thoracic epidural analgesia going on and there are different camps. Our upper GI surgeons demand it because it provides excellent pain relief but get rather irate at some anaesthetists when a technical failure occurs. The Australians are going against epidural analgesia and promoting wound catheters and TAP blocks (that are only any use if placed near the quadratus lumborum and block the nerve root). This latter approach has been adopted by many ERAS promoters, but at the expense of increased pain.

There is a pressing need to recognize the flaws in epidural analgesia and look more closely at why some patients in the absence of technical failure get good pain relief and others get poor pain relief.

Overall this paper makes a good contribution to the literature, is timely and like many reports of clinical practice raises more questions than answers.”

We agree with Dr Mcleod that epidural analgesia is an imperfect science and that a significant proportion of patients will get inadequate analgesia despite an apparently successfully sited catheter. We also agree that our paper leaves a number of questions unanswered, but feel that our study adds significantly to the body of evidence surrounding factors that may influence success or failure, and hope that it will help stimulate further research interest in this area of practice.

Reviewer 2:
“Preliminarily, I am concerned by the statement in the discussion first paragraph, that “in absence of published guidelines […], it is unclear what degree of ongoing practice is required to maintain competence in providing epidural anaesthesia”. Authors cite three scientific societies of the utmost importance, but that are not the only ones entitled to be a reference in terms of anaesthesia training. To cite only two other cases, recent guidelines were recently published, that could have been taken into account.”

We agree with Professor Cinnella that the Royal College of Anaesthetists, Association of Anaesthetists of Great Britain and Ireland, and the American Society of Anesthesiology are not the only bodies entitled to define the requirements of worldwide anaesthesia training. We accept that the bodies Professor Cinnella lists have produced extensive guidelines detailing the requirement for training in epidural catheter insertion, and have amended the manuscript to acknowledge this. However, we do not feel that either of these guidelines address the issue of how many insertions are required to become competent, or, perhaps more importantly, remain competent, which is the main issue considered in our study.

“The study design present a major limitation that is to mix up all cases of epidural anaesthesia failure (i.e. technical failure, unacceptable side effects and inadequate analgesia), that are due to very different causes, such as technical skills (different for lumbar vs thoracic anaesthesia), drug delivery doses/volumes/concentrations (that are not discussed nor reported), level of catheter insertion, surgery classification in terms of pain induction or even genetic differences in pain threshold. Therefore it is impossible to really understand how many failures where explainable with practitioners grade and/or frequency of practice.”

Whilst we appreciate Professor Cinnella’s comments regarding our groupings of causes of epidural failure, we feel that they are justified for several reasons. Firstly, the overwhelming majority (~83%) of failures were due to inadequate analgesia, with technical failures, including disconnections, and side effects making up only 14% and 4% respectively. Secondly, we feel that these factors are related and form an important part of the overall process. For example, inadequate analgesia may be caused by migration of an improperly secured catheter, and inadequately treated pain may predispose to nausea. This is analogous to tracheal intubation, where a failure to properly secure an endotracheal tube leading to inadvertent extubation would be perceived as a failure of technique. It would be our contention that the attending clinician (in this case the anaesthetist) is responsible for the overall quality and effectiveness of an intervention (epidural).

We accept that there was no standardisation of the drugs or doses used to establish the epidural in theatre, but once the patient had left the operating theatre patients were administered a 0.1% bupivacaine with 2 micrograms/ml fentanyl according to a standardised protocol, and received standardised analgesic adjuvants (paracetamol +/- ibuprofen). This dosing is discussed on page 6 of the manuscript in the methods section.
As Professor Cinnella alludes to, the spinal level that the catheter is inserted at, particularly in relation to the level of the surgical incision, may impact upon the degree of analgesia provided. The level of catheter insertion was not standardised in the this study, as it was a retrospective study of anaesthetists practice, and as such it is up to the practitioner to determine the most appropriate level to site the catheter. Whilst we have not standardised the insertion site, we have presented and discussed data relating the likelihood of success or failure to the site of catheter insertion. Although we have considered this as a separate issue, it may also be interlinked to practitioner experience. A more experienced anaesthetist may have a greater knowledge of what incision is likely to be required for a given operation, and have a greater understanding of the most appropriate level at which to site the catheter. Similarly, the surgical incision could not be standardised, as different surgeons may employ different techniques to undertake what is superficially the same operation. This is our rationale for analysing multiple procedures with incisions in differing locations. We have analysed these together to provide a ‘headline’ rate of failure, but also individually, as we appreciate that, for example, an upper midline laparotomy may cause significantly more pain than a small Pfannenstiel incision. These data are presented on page 9 of the manuscript and discussed on pages 12 and 13.

As discussed above, we accept that genetic factors may affect the likelihood of successful analgesia, but this study was not designed to assess this, and the construction of such as study in as ethnically diverse a population as the UK would be extremely difficult.

“data on how many physicians were involved in the study are presented only in table 1: there is a great difference between the number of consultant (670) and the number of locums, trainees and speciality doctors (overall about 180) that should be discussed since it can be a cause of bias in data analysis or a source of other explanations for epidural failures. It is therefore difficult to understand the real meaning of the results presented, nor is fig. 3 more clear. A median of 8 epidural per anaesthetic year seems indeed too small to draw conclusions.”

We agree with Professor Cinnella’s comments regarding the disparity between the number of epidurals inserted by consultants and the other groups, and have added a discussion of the potential bias induced in the results by this to the manuscript. Despite the disparity, we still feel that it is reasonable to include the other staff groups in the analysis, as the number of insertions reported are comparable to some other studies reporting epidural failure rates.

“Figure 1 is unclear: instead of showing number of epidural inserted above, below the umbilicus and their sum (which is confounding), a figure showing the ratio of failures/insertions could have been more useful.”

Figure 1 does not show the sum of incisions above and below the umbilicus at each vertebral level. It shows the number of epidural catheters inserted for three different categories of incision; for wholly infra-umbilical incisions, for wholly supra-umbilical incisions and for full midline laparotomies (the group previously
labelled as above and below the umbilicus). We have amended the legend for the figure to make this clearer.

“Fig. 2 : why to present only data for abdominal incisions?”

Our study only considers epidurals inserted for abdominal incisions, as the number of epidurals inserted for other operations was extremely small (11 insertions). Consequently figure 2 only presents data for abdominal incisions. The text relating to abdominal incisions has been removed, to make it clearer that this figure refers to all of the epidurals inserted in this study.

“Fig. 4 could be eliminated”

We have removed this figure from the manuscript.

“Figure legends are overall too concise and not clear.”

We have attempted to make the legends clearer and easier to understand.

Sincerely

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