
REVIEW ARTICLES

TOPICAL ISSUES IN OBSTETRIC ANAESTHESIA

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In this article I will pick a series of randomly chosen topics. I chair discussions at the Obstetric Anaesthetists Association, and have responsibility for the anaesthesia service to a teaching maternity unit, and the topics I have selected represent those that have required a decision, or generated a discussion with my colleagues. A general principle is that decisions, wherever possible are based on the available evidence, and where that is lacking, the cheapest option is preferred.

One of the reasons why some of the topics below have merited discussion is because of a clinical catastrophe reported in the national press. One incident, that is now historic, has the potential to radically change the way we work.

Right drug wrong route

In September 2003, The Pharmaceutical Journal reported the conviction of a haematology Registrar on a charge of manslaughter. Dr Mulhem failed to check a prescribed dose of vincristine, and ignored instructions that a syringe was not to be given intrathecally. Consequently a young cancer patient received a lethal dose of intrathecal vincristine, and died three days later. Dr Mulhem received a jail sentence ^[1].

This has not been the only intrathecal vincristine death in the UK, and specific criticisms have been made of the procedure. These are that it was too easy to bypass protocols and controls, that drugs intended for intravenous and intrathecal use were packaged together, that the doctors carrying out

the procedure lacked knowledge and experience, and that there was no supervision.

It is the second of these criticisms that concerns us, relating to how we distinguish between syringes intended for intravenous or intrathecal use. Indeed, the new challenge is to devise a system that makes it impossible to give a drug by the wrong route. One way to achieve this would be to devise a non Luer system for central neuraxial use. None of the components in such a system would be compatible with current intravenous components. There are two non-Luer prototype systems currently under trial in the UK.

A moment's thought should make it clear that if such a system existed it would rapidly become mandatory for all neuraxial blocks. This in turn would make it necessary to duplicate all needles and syringes in every anaesthetic environment. Not surprisingly, the disposable companies are viewing the tests with interest and concern, because the development of new production lines would be very expensive. It remains to be seen how this will develop.

Wrong drug right route

'The Times' this year featured the story of a woman who died in the immediate postpartum period when a bag of bupivacaine intended for epidural use was administered intravenously to treat her postpartum haemorrhage ^[2]. Two other deaths related to the intravenous administration of epidural local anaesthetic are known to have

occurred in surgical patients. Bupivacaine has a reputation for irreversible cardiac arrest ^[3].

These deaths have prompted the National Patient Safety Agency (NPSA) to draft a report. They summarised the main risks as follows:

1. Size, shape and labelling of syringes and bags intended for intravenous and epidural infusions may be very similar
2. Stocking different strengths and volumes of local anaesthetics can create confusion
3. Local anaesthetic and intravenous fluids may be stored together
4. Epidural and intravenous infusions may be in use concurrently, with potential for misconnection on either part
5. Confusion between infusions might be increased if identical pumps are used

Draft recommendations for improving safety have been put out for discussion. These have five points ^[4]:

1. The colour and design of epidural products should distinguish them from intravenous.

This has already started to happen. Bags of bupivacaine sourced from a commercial manufacturer already have a yellow label incorporated, albeit somewhat faint, and with room for improvement. Where bags of local anaesthetic are prepared in hospital pharmacies additional coloured labelling can be introduced. The NPSA also recommends that two people check each bag.

The range of available epidural solutions should be simplified

Epidural infusion bags and syringes should be stored in a locked cupboard or refrigerator, quite separately from intravenous products.

Epidural administration sets should be readily distinguishable from intravenous administration sets.

Yellow seems to be the colour that signifies epidural, and some manufacturers have already incorporated this colour into their tubing. Alternatively, yellow tubing can be purchased.

Epidural and intravenous infusion pumps should be physically different and used without crossover.

Recently the Obstetric Anaesthetists Association sought to discover how many units in the UK already complied with the NPSA recommendations. With regard to identification of epidural bags and syringes, 11% felt there was no clear system. Only one solution was used in 93% of units, and 4% did not have separate storage facilities. All but 9% thought their administration sets were different, and 35% were using pumps that were not distinct from those for intravenous use. One in five units had experienced a wrong route error, and one unit admitted to a wrong pump error, when a bolus of syntocinon triggered an emergency Caesarean section. Even if we assume that errors are under-reported, this survey suggests that wrong route errors are a significant risk, and the outcome is not always benign.

Intralipid

A chance finding that rats given intravenous lipid emulsion seemed more resistant to the cardiotoxic effects of bupivacaine prompted one research team to study this further. Weinberg and colleagues showed that a greater dose of bupivacaine was needed to induce asystole in rats receiving Intralipid as a pre-treatment, or as part of resuscitation ^[5]. The mechanism of action could be due to a mopping up effect as free bupivacaine enters the lipid emulsion. Other possible explanations might be that the lipid interferes with bupivacaine's ability to impair the production of adenosine triphosphate within the myocyte.

There are now two reports of successful resuscitation following local anaesthetic induced cardiac standstill ^[6,7], and despite real proof of its efficacy, a risk-benefit analysis comes down in favour of its use. With some speed, most UK maternity units now have a bag of 20% Intralipid in the fridge. The Association of Anaesthetists of Great Britain and Ireland have circulated a protocol for its use and another can be found at a website set up by anaesthetists ^[8].

Aseptic technique

An anaesthetist performed a spinal anaesthetic on a 50 year old man for an operation on his ankle. He had received verbal and written information regarding the procedure from the anaesthetist. The spinal was performed in the sitting position with single use equipment. The back was sprayed with chlorhexidine, The anaesthetist wore hat, gloves and mask but no gown. His nurse did not wear a mask. The operation was performed without incident, but the man developed a headache the next day. On the second day an epidural blood patch was performed which did not help. On the third day, another anaesthetist noticed that he had a bilateral facial palsy, and transferred him to a neurological unit. At lumbar puncture his CSF was purulent and streptococcus oralis was grown. Despite treatment with antibiotics, his disabilities did not recover, and he sought compensation through the courts^[9].

At the time this case report appeared, we had already reconsidered our asepsis policy. We chose chlorhexidine in alcohol because it is superior to iodine^[10], and we apply it by spray because it is more convenient, cheaper, and just as effective as single use sachets, which are regarded as the best option^[11]. Surgical 'scrubs' take up the wearer's skin flora, so an impervious gown is necessary, and the anaesthetist above was criticised for not wearing one. Few would argue with the necessity of hat and gloves, but one survey found that 50% of obstetric anaesthetists did not wear masks^[12]. It is not always possible to identify the source of the organism, but in our report it clearly comes from saliva. Talking over a sterile tray will coat the contents in saliva droplets, and it is this that is prevented by wearing a mask. Like 'scrubs', masks are only effective for a short time, but for regional blockade this is not a problem^[13].

When we made our policy on masks for obstetric procedures, we applied two tests. The first was whether, as patients, we were happy with the concept that the operator's saliva might be introduced into our bodies. Not surprisingly, we preferred that the anaesthetist should take steps to limit the possibility. The second test was a risk versus benefit analysis. Mask wearing did not increase the risk of the procedure, but might provide some benefit. Lastly, it is cheap and

convenient. We now insist that a mask is worn for all obstetric regional blocks, and this has become the policy throughout the city. Only my colleagues in the general theatre continue to practice to the old standard, something that can no longer be considered best practice.

Saving Mothers Lives

At the end of last year The Seventh Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom, covering 2003-05, was published^[14]. The reporting of maternal deaths began in the 1920s, and the current report marks 54 unbroken years of audit. UK law requires that all maternal deaths are notified, and this triggers an enquiry. Those involved are responsible for completing a form the size of a small newspaper, and these are assessed locally and then nationally, where they become anonymised. Eventually all the stories are categorised and woven into a multi-disciplinary report. Deaths have four categories, Direct - where the cause of death is directly linked to pregnancy, Indirect - where co-existing morbidity has been made worse by pregnancy, Late deaths, that occurred outside the 42 day classification, and Coincidental deaths that included 19 murders on this occasion.

Case ascertainment has improved in recent years, and this equates with quality of data. Capture is estimated to be close to 100%. The quality of background data has also improved to provide the figures with a degree of perspective. In common with most European countries, the birth rate in the UK has been falling steadily for some years, but recent growth in immigration has changed all that and fertility has risen from 1.6 to 1.8. Currently in the UK one out of every four women giving birth was born overseas and failure to understand English, failure to use available services to advantage, and inappropriate or non-existent interpretation have all made their contribution to the death tally.

Over half of all the women who died were obese, attracting a higher incidence of miscarriage, thromboembolism, diabetes, pre-eclampsia, induction of labour, delivery by caesarean section, postpartum haemorrhage, wound infection and adverse outcome in general. It is clear that some units are poorly equipped to cope with the obese,

being unable to provide suitable sizes of blood pressure cuffs, sturdy operating tables and long needles. To overcome this, a new guideline for the management of the obese is requested, that takes into account a low threshold for invasive arterial monitoring and increased doses of low molecular weight heparin.

There were six maternal deaths due to anaesthesia, and once again the assessors felt that care was substandard in all. An additional 31 women were considered to have received poor quality anaesthetic care. Three women were obese, all developing postoperative respiratory difficulties. Trainees managed two of these. The Report paints a sad picture of UK anaesthesia, poorly equipped, overdependent on trainees, slow to anticipate problems and manage the consequences. Of all the categories, anaesthesia is the only one in which all the deaths are considered to be avoidable.

The Report proposes that modified obstetric early warning scores be introduced next year, something that will complement the development of obstetric critical care. Changes in the number of hours worked by trainees and the formalisation of their training are, in relative terms, de-skilling this section of the workforce, whilst at the same time the nature of the work is becoming more challenging. It is no longer appropriate to ask the least experienced grade to provide a first response. The system that has supported the service for so long is showing signs of strain, and change is needed.

Anybody who is accustomed to looking in the mirror will be aware that change is inevitable. Often in clinical practice there is a reluctance to make changes, but without change the process will cease to reflect best practice. On the other hand, too much change can destabilise, so the process should follow a course that is more evolutionary than revolutionary. This article has sought to throw up some points for discussion, and to examine them with a view to moving forward.

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