Epidural Blood Patch (EBP) and septic complication

To the Editor:

I read with interest an informative review article by P.J. Duffy and E.T. Crosby (The epidural blood patch. Resolving the controversies).¹ I would like to comment on the issue of septic complication of EBP. In a North American survey of the management of dural puncture, 18 of 36 centres mention sepsis in the informed consent discussion as the complication of EBP.² The incidence of bacteremia has been estimated as up to 7.3% after normal vaginal delivery and higher with prolonged labour, chorioamnionitis and retained placenta.³ The statement by the authors that pyrexia may reflect concurrent bacteremia and therefore EBP should be delayed until the patient becomes afebrile, raises some questions. For how long the patient should remain afebrile before EBP?

In a patient with bacteremia, EBP is contraindicated⁴ but the bacteremic patient may be afebrile. Cases have been reported, where after delivery, patients have developed meningitis after EBP, while they were afebrile at the time of EBP.⁵ An important, but less widely appreciated, cause of aseptic meningitis is systemic drug administration. Drug-induced aseptic meningitis has been reported after non-steroidal anti-inflammatory agents, ranitidine and cefazolin, which may be difficult to differentiate from bacterial meningitis.⁶

There is no controversy that EBP should not be done in febrile patients, but in afebrile patients, should we (while performing EBP) send blood for culture & sensitivity? A negative blood culture result would also prove that blood was aseptically collected and in the case of a positive result, a specific antibiotic can be commenced early.

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REPLY:

We thank Dr. Anwari for his interest and comments concerning the potential for septic complications following epidural blood patch. Unfortunately, this facet of care has not been well studied and we have limited data to inform clinical decision-making.

Transient bacteremia is common, resulting from seemingly trivial events such as dental cleaning, brushing and flossing of teeth, and chewing hard candy.¹ These bacteremias are typically both short-lived, lasting less than 15 min, and benign, posing little threat to patients save perhaps those with cardiac structural abnormalities.^{1,2} Crawford reported a 1% incidence of positive cultures in women when blood was drawn within 30 min of delivery.³ Presumably, positivity would occur at even a lower rate at times more distant to delivery.

Persistent, more clinically threatening (pathogenic) bacteremia is unlikely to occur without pyrexia and other evidence of sepsis. The presence of fever should lead one to seek a diagnosis and if sepsis is diagnosed, appropriate antibiotic therapy should be commenced. Common sense dictates that an epidural blood patch should not be performed in a febrile patient. The etiology of the fever should be sought and treated appropriately. It is prudent to proceed with an epidural blood patch only after the clinical situation is clarified and resolved.

We do not think that routine blood cultures are indicated in otherwise well patients at the time of epidural blood patch. The likelihood of a true positive result is low, and a false positive result is more likely in this low risk population. Moreover, in the absence of other evidence of sepsis, antibiotic therapy would not be indicated solely on the basis of a single positive blood culture. In Berger et al.'s survey of the management of dural puncture headache in North America, only one centre (1/36) routinely submitted blood for culture at time of patching, suggesting that it is an uncommon practice to do so.⁴ In our exhaustive search of the literature, only partly referenced in our recent review, we could find no data which would prompt or support a change in this pattern of practice.

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High Frequency ventilation

To the Editor:

I read with great interest the recent article of Aubin *et al.* describing the use of high frequency ventilation during the intraoperative care of an infant with diffuse bullous lesions.¹ The authors should be congratulated for the care they provided this child. They demonstrated the overlap of the intensive care unit and the operating room as well as the need for anesthesiologists to maintain a working knowledge of new technology in both settings. In their discussion, the authors rightly state that $P_{ET}CO_2$ cannot be measured during high frequency ventilation.² Although the authors state that arterial blood gases must be sampled to frequently, I would like to suggest another alternative. We published our experience with transcutaneous CO_2 monitoring during respiratory failure and following cardiothoracic surgery in infants and children.^{3,4} In addition to the obvious problems with $P_{ET}CO_2$ monitoring during high frequency ventilation, other factors including ventilation-perfusion inequalities, sampling errors, and patient positioning can interfere with its accuracy. In infants and children with respiratory failure, we found that transcutaneous monitoring provided a better estimation of $PaCO_2$.³ Despite our success with this technology, its use outside the neonatal period and especially in the operating room remains limited. With recent advancements in the technology, transcutaneous CO_2 has become a simple, non-invasive way of estimating $PaCO_2$. We are currently investigating the applications of this technology in the adult population.

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REPLY:

We agree with Dr Tobias that the measurement of $P_{ET}CO_2$ is a poor way to estimate $PaCO_2$ especially when using non-conventional modes of ventilation. Our experience with the measurement of carbon dioxide through a transcutaneous electrode in the operating room (OR) is limited. We are however accustomed to its routine use in the neonatal intensive care unit.

The reason why we do not use it in the OR is the lack of expertise and appropriate training of personnel working in the OR or in the pediatric intensive care unit (PICU). Although Dr. Tobias' articles validated this technique for even older patients than the neonates, they also show that technical variables (air bubbles, calibration, damaged material) and patient problems (skin thickness, edema) can alter the measures. These problems and a drift with time of the values obtained by the transcutaneous CO_2 electrode explain why this promising technique has not yet gained wide acceptance among those of us involved in the PICU. Moreover, it is not always possible in the OR to change the monitoring site regularly to avoid thermal injuries. Therefore we continue to routinely insert arterial lines for sampling because we rely on the accuracy of the values obtained. Nevertheless, we agree that transcutaneous CO_2 monitoring can be a useful complement to other techniques especially when these are invasive or partly accurate.

We look forward to the development of alternative non invasive techniques to monitor our patients better and we agree that use of transcutaneous probes can be a promising avenue when the initial technical and practical problems are solved.

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