Sir,

Drs Sinha and Levene comment:

We thank Dr Singh for his letter. Unfortunately he is mistaken in his belief that paralysed infants lie in an extended posture. They adopt the classical ‘frog position’ seen in severely hypotonic infants. Their arms are semiflexed, wrists pronated, hips abducted, and knees partially flexed—certainly not fully extended. The knee contractures we noted fitted closely the position of partial knee flexion seen in paralysed infants. We feel that Dr Singh’s other points have already been discussed by us.

Monitoring of intracranial pressure

Sir,

In their short report, Levene and Evans suggest a ‘new’ method for continuous measurement of intracranial pressure. We would question, unless a theoretical or clinical reason is given, their statement that ‘subarachnoid catheters may be better suited to long term monitoring’, especially since these catheters are usually kept in place for short periods (76 hours was the longest duration in their study). Furthermore, insertion of an extremely large needle (16 G) into the fontanelle of a neonate seems unnecessarily invasive and might greatly increase the risks of trauma to brain tissue and infection. In 1982 we described a method of intracranial pressure monitoring using a much smaller (22 G) catheter. This method has been proved to be highly reliable and safe.

Intracranial hypertension, per se is of little clinical importance. Maintenance of cerebral perfusion pressure, adequate to ensure a cerebral blood flow and therefore sufficient substrate supply for cerebral metabolism, may be an important factor in the mortality and morbidity of childhood central nervous system diseases. We have previously shown that in cerebral ischaemia, the late development of increased intracranial pressure and its treatment does not significantly affect outcome in these patients. It is the severity of the ischaemic insult that

References


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determines the prognosis. Levene and Evans fail to report data on cerebral perfusion pressure in their study and do not detail the difference between the neonates that survived and those who died. We, therefore, find it difficult to accept their premises:

1. That monitoring of intracranial pressure affected outcome in their patients.
2. That such monitoring might be important in the management of children with neonatal asphyxia.
3. That the method described has any advantage over monitoring methods previously described.

In summary, it is suggested that continuous monitoring of intracranial pressure in children with head trauma, cerebral space occupying lesions, central nervous system infections, and metabolic diseases accompanied by increased intracranial pressure, enables assessment of cerebral perfusion pressure. Maintenance of adequate cerebral perfusion pressure (greater than 30 to 40 mm Hg) by rapid initiation of treatment to ensure adequate arterial blood pressure and reduction of increased intracranial pressure might be an important factor in the prognosis of these central nervous system diseases. In cerebral ischaemia, however, prognosis depends on the severity of brain damage incurred during the ischaemic period and not necessarily on the degree of intracranial pressure that develops later in the course of the disease.

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Drs Levene and Evans comment:

We thank Dr Goitein for his interest in our paper. His criticisms are fourfold and include the invasiveness of our method, its advantage over other methods, our failure to report cerebral perfusion pressures, and the effects of monitoring on outcome. We will attempt to answer these points.

Since publishing our short report we have now had the opportunity of studying a further eight infants making a total of 13 babies in whom intracranial pressure has been successfully monitored. These are reported in detail elsewhere. No complication related to the method has yet been found either clinically or on ultrasound, computed tomography, or at necropsy. We elected to attempt subarachnoid placement of a fine catheter because when we attempted the method described by Goitein et al we found difficulty in obtaining reliable continuous measurements because of kinking of the catheter and difficulty with accurate placement. In addition, they failed in their original report to describe the amplitude response of their system which may cause distortion of the signal and make reliable measurements doubtful. One infant studied recently by us was continuously monitored for a total of 10 days before the catheter was removed, which justifies our statement that we can safely perform long term monitoring. We note from Goitein’s published data that the longest duration monitoring that has been performed by him is seven days.

Our original report intended to describe simply a new method of monitoring intracranial pressure. Space did not permit discussion of cerebral perfusion pressure monitoring. We agree cerebral perfusion pressure is an important variable to measure and we have developed a microcomputer-based system which calculates this from intracranial pressure and arterial blood pressure in all infants in whom intracranial pressure catheters are inserted. We are currently collating our data on intracranial pressure, cerebral perfusion pressure, and outcome.

We regret that Dr Goitein seems to have missed the point of our short report. We described a method which in our hands seems to measure intracranial pressure in asphyxiated newborns safely. We did not state that measurement of the intracranial pressure would necessarily affect the outcome of asphyxia but merely speculated that knowledge of this would allow more objective management of these infants. We consider it unreasonable for Goitein to assume that these questions have been answered by his own studies. In his three published papers, as far as can be ascertained, only one infant who suffered perinatal asphyxia and one other neonate who developed cerebral ischaemia after septic shock were included. All the other babies except one (aged 25 days) were out of the neonatal period. We do not, therefore, consider Dr Goitein’s experience of the asphyxiated newborn to be sufficient to raise objection to our method which attempts to answer just the questions that he poses. Data on intracranial pressure and cerebral perfusion pressure exists in infants and older children but there is no evidence that these patients behave in a manner similar to the asphyxiated newborn. We look forward to further data from our Israeli colleagues on the importance of measurement of intracranial pressure in the neonate suffering from birth asphyxia.

References

Monitoring of intracranial pressure.

K J Goitein

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