than 0·75 kg accounted for 67% of all deaths'. They also state that 'the use of surfactant in infants of lower weights may improve survival rates but also may be associated with a higher incidence of chronic lung disease among survivors'. This should reinforce our hesitancy.

The purists may argue that conclusions can only be drawn when all the data are available. I certainly accept the scientific logic of this attitude but I have a sneaking suspicion that by adhering to such august principles we are in danger of rediscovering the wheelbarrow.

What appears to be clear is that if surfactant therapy is given to babies of a reasonable size and in good condition at birth a good outcome should be expected. My view is that to administer this treatment to tiny, cold acidotic babies is to court disaster. For such babies we require to sit down and think again.

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Commentary

I agree with Professor McClure. The time for surfactant therapy has arrived but he is right to encourage caution and scepticism about individual clinical trials. Some of the trials have enrolled highly selected groups of babies, for example only babies weighing more than 700 g, on a ventilator, in more than 60% oxygen, or who have no complications. The results are then interpreted as applying to all babies.

However, there is now the most impressive body of data in the history of neonatology from multicentre, double blind, placebo controlled, randomised trials showing that surfactant replacement therapy saves lives and reduces morbidity. Surfactant used for prevention or treatment has been shown to be both safe and effective.

Surprisingly, Professor McClure has suggested that extremely small, hypothermic, asphyxiated babies should be excluded from the trials. I'm not quite sure he believes that they 'might have been better left alone', particularly as this is just the baby 'who needs our help most but who is at the limit or is possibly beyond the range of our knowledge'. If we do not study such babies they will remain beyond our knowledge. Their extreme immaturity might suggest that they will not respond dramatically to surfactant treatment. However, we will never know if we do not enter them into appropriate trials.

It is very difficult to obtain enough data from extremely low birthweight babies because they are relatively rare. In consequence most studies only allude to the possible effects in this group. The following information is available from published randomised controlled trials about the effect of treating extremely low birthweight babies with surfactant.

In a multicentre randomised trial placebo or Exosurf (5 ml/kg) was given to 215 babies with birth weights of 500 to 699 g.[1] Treatment with Exosurf was associated with a significant improvement in oxygen requirement, persisting for three days. The incidence of pneumothoraces was significantly reduced from 25/109 (23%) to 11/106 (10%), and deaths from respiratory distress syndrome were significantly reduced from 26/109 (24%) to 15/106 (14%). The incidence of other complications was not altered except that pulmonary haemorrhage occurred significantly more frequently in the Exosurf treated babies at 12/106 (11%) compared with 2/109 (2%) for the controls.

A randomised trial compared calf lung surfactant administered at 90 mg in 3 ml either prophylactically (n=235) or as rescue treatment (n=244) to babies less than 30 weeks' gestation, with repeated doses as necessary.[2] It was shown that there was a highly significant reduction in mortality in the babies less than 26 weeks who were treated with surfactant prophylactically 21/85 (25%) compared with rescue treatment 33/72 (46%). The incidence of pneumothorax was also reduced in the babies less than 26 weeks treated prophylactically 6/85 (7%) compared with the group given rescue treatment 13/72 (18%). There was no other significant effect. There was no indication that prophylactic therapy caused such small babies any harm.

In the ten centre trial of ALEC prophylaxis to babies between 25 and 29 weeks' gestation, the neonatal mortality for babies of 25 to 26 weeks' gestation was reduced from 15/32 (47%) to 13/43 (30%).[3] The sample size was small and this 36% reduction in mortality failed to reach statistical significance. The effect of artificial surfactant was equivalent to babies being older by over one week of gestation.

These effects of surfactant treatment on extremely immature babies although relatively preliminary, are consistent. They show that surfactant treatment for these extremely low birthweight babies has important beneficial effects. The only adverse effect so far reported is pulmonary haemorrhage with Exosurf. This has not been reported so far with other surfactants, although many trials have excluded babies less than 700 g and the number of such tiny babies in the other trials is relatively small.

Surfactant treatment has not been shown to have much effect on brain haemorrhages and

chronic lung disease in extremely small babies.

Professor McClure is right to be cautious about the use of this new and expensive treatment but I am encouraged by the data available so far and believe we should be helping these vulnerable babies with one of the best and least toxic treatments available to neonatologists. The important thing to watch in the future is whether surfactant treatment has any effect on long term morbidity in this group. The overall results on follow up published so far are encouraging.

Part of the fascination of research is that one's preconceived ideas are often proved wrong when proper studies are done. I think doubts about the benefit of surfactant for extremely immature babies may be just such a situation.

COLIN J MORLEY
Department of Paediatrics,
Addenbrooke's Hospital,
Level 8,
Hills Road,
Cambridge CB2 2QQ

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