PostScript

LETTERS

Response to: Should paediatric central lines be aspirated before use?

Drs Coulthard and Skinner are correct to highlight the potential dangers of clot embolisation from paediatric central lines.¹ There is, however, an equally strong argument for aspirating the lines to remove heparin and prevent inadvertent systemic anticoagulation.²⁻³

Haemodialysis lines in particular have relatively large volumes in comparison to patient size and it is not uncommon to have a line with a lumen volume of 0.8 ml in a small (eg, 10-kg) child. If the line is locked with 5000 U per ml heparin as the authors describe, this means the line contains 4000 U of heparin or 400 U/kg bodyweight. This dosage of heparin flushed into the child is more than five times the bolus dose for systemic heparinisation.⁴ There are reported instances of children and adults coming to harm from the flushing of central lines containing heparin.

Central lines should certainly be aspirated before use and, in addition, the concentration of heparin reduced to the minimum necessary to prevent clotting (in our unit we now use 100 U/ml). Alternatively, a different drug should be used such as urokinase or alteplase, or citrate, where the difference between line locking dose and systemic dose is far greater.

Perhaps most importantly, paediatricians should recognise that the drugs we use to flush and lock vascular access are indeed drugs capable of inducing harm.

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Underestimation potentially better than overestimation

Luscombe and Owens¹ propose a new formula (weight(kg) = 3(age+7)) for accurately estimating weight in the 21st century child. They point out that in most cases the classical formula (weight(kg) = 2(age+4)) underestimates actual weight and that this has implications for potential underdosing of resuscitation drugs and fluids. One of the factors implicated

by the authors in this increase in weight is the rising prevalence of childhood obesity.

Changing the prescription of intravenous fluid volumes on the basis of what is essentially an increase in adiposity has wider implications extending beyond the resuscitation period. Current maintenance intravenous fluid requirements in children are based on the supposition that energy expenditure is linked to body weight, assuming 1 ml of water loss is associated with the consumption of 1 kilocalorie.² In actual fact, resting energy expenditure is more closely related to fat-free mass.³ In addition, it is well recognised that energy expenditure in sick children is significantly lower than in the healthy children studied in the original work on maintenance fluid requirements.⁴ This leads to the suggestion that current weight-based fluid calculation formulae overestimate the maintenance intravenous fluid requirements of children. In addition, blood volume in children is most closely related to lean body mass,⁵ suggesting that this should be the basis for resuscitation fluid volumes.

A change in the weight estimation formula as described might therefore lead to significant, and potentially dangerous, excess fluid being administered to children. It would be interesting to know what proportion of the rise in weight over the last 50 years is related to height increase and therefore might be attributed to an increase in lean body mass. Until there is good evidence of harm, however, the current weight estimation formula should remain in place. It may confer significant benefit, rather than detriment, by virtue of its underestimation.

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Different interpretations of British Thoracic Society guidelines on the emergency self-management of asthma in children

British Thoracic Society (BTS) guidelines on the management of asthma were first published in 1990 and are regularly updated.¹ The most recent update recommends that personalised asthma action plans are offered to all patients with asthma.

Such plans should describe the appropriate action to be taken when asthma symptoms worsen. Bronchodilator medication, in the form of β_2 agonist, should be administered. However, it is very important that help is sought if this intervention is not effective at an accepted dose and frequency. The licensed dose of salbutamol in the acute management of asthma is 200 μ g four times daily, but the doses and frequency recommended by BTS guidelines are liable to different interpretations. Studies have been undertaken using different doses of β_2 agonist in the emergency situation, and one these studies showed maximum bronchodilation after four doses of 400 μ g albuterol.² Increasing inhaled steroids has not been shown to be effective in acute asthma.¹

Parental feedback to specialist nurses highlighted the fact that professional staff are giving very different advice from each other, leading to confusion.

In response, two small audits were undertaken with secondary care medical staff (n = 22) and respiratory nurses attending a national meeting (n = 14). Results indicated that the range of bronchodilator dose considered acceptable for parents to administer to children aged 3 and 11 years with an acute asthma episode at home, before seeking medical advice, varied from 100 μ g 2 hourly to 2000 μ g 4 hourly. For the 3- and the 11-year-old children, 12 and 14 different regimes were suggested, respectively, by 36 health professionals.

Administering a high-dose bronchodilator via a spacer is recommended as treatment for mild to moderate asthma attacks in children and is generally thought to be safe.¹ We are concerned that inconsistent advice on the dose and frequency of β_2 agonist may confuse parents and could result in inadequate treatment or a delay in seeking medical help. We suggest that further research and the development of a consensus on appropriate dosage and frequency of administration to be used at home would facilitate consistent and safe practice.

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