

PostScript

LETTERS

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Weighing alone will not prevent hypernatraemic dehydration

Having recently reviewed the case notes of babies readmitted to hospital in the first 10 days of life (over a one year period), we firmly agree with the views expressed by Laing and Wong.¹ The incidence of documented hypernatraemic dehydration secondary to the failure of lactation in Bristol is 1.7 per 1000 live births much higher than that described by Oddie *et al* in the Northern Region (2.5 per 10 000 live births).² In addition only 50% of infants readmitted with weight loss of <10% had a plasma sodium concentration measured. The true incidence of hypernatraemic dehydration secondary to lactation problems in Bristol could thus be as high 3.4 per 1000 live births. Our estimate could be an underestimate. Firstly, our study looked only at infants readmitted within 10 days (Oddie *et al* looked at infants readmitted up to 1 month of age) and secondly, due to failure to recognise of this condition.

Laing and Wong proposed weighing all infants when the Guthrie blood samples are taken, to identify those infants at risk of dehydration.¹ We believe that this is too late as in many areas this occurs on days seven or on day 10 with handover of care to the health visitor. We have already described a series of babies with hypernatraemic dehydration where all presented to hospital before day seven.³

The case has been made correctly that newborn hypernatraemia is due to unsuccessful feeding.^{1,4} While we agree that careful examination and observation of the infant while feeding and so forth may identify these babies, we would dispute that this is currently universally possible. Due to midwifery shortages, postnatal wards are short staffed and community midwives are fully stretched, so many women are discharged within a few hours of delivering. If a midwifery home visit does not coincide with a feed, the mother's assessment of feeding is assumed to be correct (as indeed it usually is). Weighing the baby will reassure most mothers that their baby is following the normal pattern of loss followed

by gain. Identification of excessive weight loss should prompt the health professional to examine the baby for evidence of illness and carefully observe breast feeding technique. These mother-baby dyads could then be given additional support and advice in the community and thus successfully establish feeding. In our experience once the baby has become ill and required readmission to hospital the mother is reluctant to continue to attempt to breastfeed.

There continues to be confusion regarding the best way to manage this problem.^{1,5} It should be remembered that these babies have normal guts and are suffering from starvation. If the infant is not shocked, rehydration can occur safely using enteral fluids: expressed breast milk or a breast milk substitute. Serum sodium should be measured six hourly initially and the volume of milk altered to ensure a slow return to normality.

We believe that we need to foster a greater awareness of this problem and weigh the babies at risk around day five if we are to prevent tragedies resulting from a common condition affecting otherwise well babies.

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Hypernatraemic dehydration: excess sodium is not the cause

I am grateful to Laing and Wong for raising once again the issue of hypernatraemic dehydration in the first few days of life.¹ However, I think it is important to remember that hypernatraemic dehydration, like anaemia, is a sign of disease and not a diagnosis in itself. A low haemoglobin concentration in blood can be caused by a large number of different pathological and physiological processes. Hypernatraemic dehydration should be seen in the same light.

Laing and Wong's article describes two situations in which a child can be found to exhibit the typical biochemical and clinical features of hypernatraemic dehydration, that is—weight loss and hypernatraemia. The first mentioned is associated with gastroenteritis in a bottle fed infant, commonly a few weeks old and the second is seen in "breast fed" infants in the first few days of life. The hypernatraemia associated with these situations is caused by different problems with water balance—in neither is the problem an increased intake of sodium. In the infant with diarrhoea there is an excess loss of water and in the "breast fed" baby an insufficient intake of water.

In discussing hypernatraemic dehydration in association with diarrhoea in young infants, Laing and Wong refer to a paper by

Chambers and Steel, where attention is drawn to the slightly increased concentration of sodium in artificial milk mixed incorrectly by parents.² This is a red herring. The excess sodium concentration of the artificial milk mixed incorrectly by the mothers reached a maximum of 59 mmol/l with a mean of 37.2 mmol/l. Those who believe that this concentration of sodium could be responsible for hypernatraemic dehydration should remember that the concentration of sodium in the standard oral rehydration solutions in use in the UK is either 60 mmol/l (Dioralyte, Dioralyte rebel, Diocalm junior) or 50 mmol/l (Rehidrat, Electrolade) and that the WHO formulation for oral rehydration solution contains 90 mmol/l of sodium.

In fact the cause of this association of hypernatraemic dehydration with diarrhoea is the continued feeding with artificial milk after the onset of diarrhoea. The intestinal hurry associated with gastroenteritis results in the delivery of a solution rich in protein and complex carbohydrates to the colon which, after digestion by colonic bacteria, produces a considerable osmotic load in the colon, which in turn results in the production of voluminous stool low in sodium.³ The result is hypernatraemic dehydration due to excessive water loss. Those who require further discussion of this hypothesis are advised to read the excellent paper by Hirschhorn.³

The second situation relates to the title of the piece, namely hypernatraemic dehydration in the first few days of life in association with "breast feeding". Though the breast milk produced, in very small quantities, by the mothers of these children is often found to contain a high concentration of sodium, this has nothing to do with their babies' hypernatraemic state. As Jack Newman puts it so eloquently in his electronic response to Laing and Wong, these babies are not dehydrated because they are breast fed but because they are only pretending to breast feed. They are, in fact, starving. This is amply illustrated by the case described in Oddie *et al* of a "bottle fed" baby admitted at 6 days of age with hypernatraemic dehydration whose dehydration had nothing to do with the bottle milk being "fed" to her but was caused by the fact that she had oesophageal atresia.⁴ Hypernatraemic dehydration is frequently seen in the elderly and the mentally handicapped when their need for basic care, and presumably a regular intake of water, is neglected.^{5,7}

Hypernatraemic dehydration is a sign of illness not a diagnosis. It is commonly caused by excess water loss or by insufficient water intake, either alone or in combination. It is almost never the result of excess sodium intake, which would result in retention of water and an increase in body weight, though this would obviously require intact thirst mechanisms and access to sufficient water.

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