

## CORRESPONDENCE

SIR,

### SERUM ELECTROLYTES AND BLOOD UREA IN HEALTHY NIGERIAN CHILDREN

May I congratulate Dr Effiong and his colleagues for their effort in providing a well-documented profile of normal values for serum electrolytes and blood urea in healthy Nigerian children (*Nigerian Journal of Paediatrics*, p. 3, January, 1974).

There is, however, one aspect of the interpretation of the values that requires comments, not primarily as a criticism, but as a pointer to an area where further work is indicated. I refer to the interpretation of the serum potassium and bicarbonate values in neonates. I do not think these values should be simply reported as normal. The authors' explanation that this is due to "the well-known neonatal renal insufficiency" is also unacceptable. The fact is that the kidneys of a normal newborn infant are not functionally deficient, any more than its temperature regulation is immature, as is popularly believed. The process of birth is a very traumatic event. It is usually associated with fetal hypoxia and metabolic acidosis, the severity of which varies with the duration of labour and the presence or absence of complications. Metabolic acidosis of any severity is associated with low serum bicarbonate and elevated serum potassium. The wide range of these values as given in the article is an indication of the wide range of possibilities in the conduct of labour and the attendant hypoxia and metabolic acidosis.

The values for cord blood similarly raise interesting conjectures in relation to the metabolic activities of the placenta once separation from the uterus begins at the onset of uterine

contractions. Whatever these metabolic activities may be, the fact that serum potassium in the newborn is lower than that in cord blood would suggest efficient handling of metabolic derangements by the newborn infant.

The value of packed cell volume (PCV) in the newborn is similarly dependent on events during delivery especially the handling of the baby *vis-a-vis* the cord at the end of the second stage of labour.

In view of the above observations it is suggested that serum electrolytes, urea, and PCV values in the neonate would be better understood if the values are correlated with the conduct of labour and associated events. I hope Dr Effiong and his colleagues will extend their good work into this area. Finally, this article has also raised the question as to the desirability of grouping neonates with other age groups in childhood in the evaluation of various parameters in medical science.

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Reply:

SIR,

We would like to express our appreciation to Professor M. A. Bankole for his suggestions on the need for a further study to correlate the serum potassium, bicarbonate and blood haematocrit (PCV) levels in the newborn infant with the events and duration of labour.

We wish however, to point out, that the metabolic acidosis and associated hyperkalaemia

found in early neonatal life cannot be explained by the duration and complications of labour alone. Though the duration of labour was not considered in those cases we studied, it should be pointed out that blood samples were only collected from babies delivered spontaneously by vertex, and who, after complete physical examination, were considered to be healthy in every respect. We were ourselves amazed to find such wide ranges and high levels of potassium in these apparently healthy neonates. However, in our article brief reference was made to the work of Kaiser (1953) who showed that the human infant *in utero* at term existed in a state of acidosis relative to its mother. It seems therefore, that persistence of this acidotic state in a healthy neonate long after delivery, is some evidence of renal insufficiency as far as the handling of the hydrogen ion by the kidneys is concerned.

With regard to the packed cell volume (PCV), we agree that the value is influenced by a number of factors which include the time of clamping

the umbilical cord. Our study was conducted on babies born at two separate hospitals where routinely the cords are clamped and ligated immediately after birth. Since the exact time of cord-clamping and ligation could not be uniform in both institutions, it is likely that the wide range of values obtained in our study was due to the variable time intervals.

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#### REFERENCES

- Kaiser, I.H. (1953): The Hydrogen ion of Human fetal blood *in utero* at term. *Science*, **118**, 29-30.