Table Concentrations of potassium in serum and plasma compared with that of plasma from whole blood collected into Concord Pulsator syringes

Subject	Serum (mmol/l)	Plasma (mmol/l)	Correctly primed syringe (mmol/l)	Incorrectly primed syringe (mmol/l)
1	3.8	3.6	3.4	2.9
2	4.3	4.1	3.8	3.2
3	4.5	4.2	4.0	3.4
4	4.2	3.9	3.7	3.7
5	4.2	4.4	4.4	3.6

Dangerous hyperkalaemia after analysis of arterial blood sample

Despite the known hazards of measuring electrolytes in heparinised arterial blood samples taken for blood gas analysis,¹⁻³ we report a case of a patient whose arterial sample was used for measurement of electrolytes which led to incorrect and potentially dangerous treatment being given. We also report the use of the same commercially available arterial blood sampling syringe on the measurement of electrolytes in samples taken from five healthy subjects.

An arterial blood sample was collected in the coronary care unit from a 74 year old man with acute left ventricular failure using a Concord Pulsator syringe (Concord Laboratories Ltd, Folkestone, Kent). Blood gas and electrolyte analyses requested on this sample gave the following results: pH 7.06, pO₂ 71 mm Hg, pCO₂ 73 mm Hg, base excess -12, potassium concentration 2.5 mmol/l. The patient was given 60 mmol of potassium over two hours by infusion in 500 ml of 5% dextrose. Eight hours later a further blood sample was collected. Analysis of this sample (SMAC 1, Technicon, Tarrytown, New York) gave a serum potassium concentration of 6.5 mmol/l which was confirmed by a repeat sample. There had been no deterioration in the patient's renal function since admission.

Subsequently, venous blood samples were also collected from five healthy subjects using Concord Pulsator syringes. One syringe had been correctly primed by expulsion of heparin diluent. The heparin diluent was not expelled from the other. Venous blood was also collected into a plain glass tube and into a lithium heparin tube. Potassium concentrations were measured in the serum or plasma by indirect ion selective electrode (SMAC 1, Technicon, Tarrytown, New York). The table shows the results. Compared with serum, there was an apparent fall in potassium concentration of up to 0.5 mmol/l when the syringe had been correctly primed in all samples but one. When the heparin diluent had not been expelled a fall in potassium concentration of

up to 1.1 mmol/l occurred. A smaller but similar apparent fall in potassium concentration occurred on comparison with plasma samples. Heparin interference in the measurement of this patient's potassium concentration was unlikely to have occurred as the heparin concentration in the incorrectly primed syringe (about 140 U/mL), would not have been high enough to interfere in ion selective electrode measurement.²

The potassium concentrations in the samples from the healthy subjects indicated that the patient's initially low potassium concentration was due to failure to expel the heparin diluent from the syringe. It is clear, however, that even when the syringe was used correctly a considerable fall in measured potassium concentration could still occur.

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Book reviews

1988 Year Book of Pathology and Clinical Pathology. Ed. KM Brinkhous. (Pp 423; £35.50.) Wolfe Medical Publications. 1988. ISBN 0-8151-1243-2.

To be honest this is the first time that I have read a *Year Book of Pathology*. It is an update of the field produced by reviewing refereed and review articles in 79 journals, 67 of which are North American. The book takes the form of 368 pages of abstracts of

original and review papers with selected illustrations, accompanied by introductory or summarising editorial comments.

In the main it is an interesting exercise. The editors from the University of North Carolina at Chapel Hill give a fair commentary, although I do not understand how the concept that liposarcomas of the breast are examples of metaplastic breast carcinomas arose, and the abstracts themselves are easily assimilable. My only criticism is the lack of a general review of the events in the period 1986 to mid 1987 which is the year covered by this book.

JD DAVIES

Notices

Association of Clinical Pathologists

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