Delivery of fluids by the subcutaneous route

Editor,—We would like to contribute to the excellent review by Mbamalu and Banerjee on the principles and problems of peripheral venous cannulation. Although peripheral venous cannulation to allow fluid and electrolyte replacement is mandatory in emergencies and in situations where strict fluid balance is required, it is worth noting that it may not always be the best route. Hypodermoclysis, the technique of correcting fluid deficits by subcutaneous infusion popularised initially in the 1950s, serves as a useful parenteral alternative to intravenous cannulation. Isotonic fluids may be introduced into subcutaneous tissues where the aim is to correct mild to moderate dehydration in elderly patients (especially in a chronic care setting where intravenous access in the infirm and elderly is notoriously difficult), in addition to being a less invasive route of drug administration in palliative management where opioid and antiemetic treatment is frequently warranted. Fluid replacement by the subcutaneous route is relatively safe, easier to initiate, demands less nursing time, is more cost effective than intravenous therapy, causes less discomfort at the infusion site, but the reported incidence of local oedema and sepsis at the infusion site, but the reported incidence of local oedema and sepsis caused by hypodermoclysis is relatively low (since it may be given into anterior abdominal tissues) and has been found to be less distressing for patients.1 2

The use of hyaluronidase in the infused solution augments the rate of fluid uptake and volumes up to 3000 ml can be delivered over 24 hours.3 Evidence suggests that potassium chloride may also be added to the subcutaneous infusion and concentrations up to 34 mmol/l have been given, with the only undesirable effect being that of discomfort at the delivery site.4 The chief technical disadvantages of subcutaneous fluid therapy are local oedema and sepsis at the infusion site, but the reported incidence of the latter is exceedingly low.5 Since the welfare of elderly patients in long term care increasingly represents the core of medical workload in Western populations it follows that hypodermoclysis can be an important parenteral route of fluid administration, and may therefore be incorporated as an additional limb in the instructive algorithm proposed by Mbamalu and Banerjee.

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The authors respond:
We appreciate the comments by Drs Gandhi and Patel. The inclusion of hypodermoclysis in the algorithm would certainly be worthwhile and the authors have made a good case for consideration of the procedure.

High dose intravenous glucagon in severe tricyclic poisoning

Editor,—I read with interest the case report by Sensky and Oliczak describing the use of glucagon in severe tricyclic antidepressant (TCA) poisoning.1 I am surprised that the patient was not treated with sodium bicarbonate and that there was no mention of the pivotal role of alkalinisation and sodium loading in the management of TCA poisoning.2

The cardiac toxicity of TCAs is a consequence of the blockade of the sodium channel in the heart.3 4 These effects can be alleviated by the administration of sodium bicarbonate, which reduces the frequency of ventricular arrhythmias, decreases the prolongation of the QRS interval, and reduces hypotension. These effects have been attributed to the increase in plasma sodium concentration, which competes to reverse the inhibition of sodium channels by the TCA. Alkalisation changes the ionisation state of TCA which may facilitate uncoupling of the TCA from the sodium channel.5 Alkalosis induced by hyperventilation can also be effective.

Their patient was acidotic with a pH of 7.29 and with evidence of severe cardiac toxicity. Initial resuscitation of this patient should have included aggressive treatment of the acidosis and administration of sodium bicarbonate. Sodium bicarbonate 1–2 mmol/kg (1–2 ml/kg of 8.4% solution) intravenously is recommended, followed by further doses to maintain an arterial pH between 7.45 and 7.55. Early intubation and mechanical ventilation is also advised in view of (i) the potential for rapid deterioration in conscious level and risk of gastric aspiration and (ii) the development of a confounding respiratory acidosis, which potentiates any cardiac toxicity.

In my experience, early management with sodium bicarbonate minimises any need for antiarrhythmic or inotropic support.

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The author responds:
I acknowledge Dr Lewis’ comment with respect to the Dutch CVST Study Group trial.1 Nevertheless I feel this study in combination with an earlier study by Einhäuser et al2 allows the conclusion that intravenous heparin should be first line treatment of CVST. The Dutch trial differed in several points from the German study, which may explain its neutral outcome. They are the altogether smaller number of poor outcomes; the larger proportion of patients with isolated...

Cerebral venous sinus thrombosis: heparin or nothing?

Editor,—A recent review article in your journal gives the impression that the case for heparinisation of all patients with cerebral venous sinus thrombosis (CVST) is proven,1 but most robust study did not come to this conclusion and its results did not achieve statistical significance.2 Given that CVST has a spectrum of presentations from headache to coma and death, a blanket approach to treatment in the absence of good evidence and continued debate3 does not seem sensible.

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The author responds:
I acknowledge Dr Lewis’ comment with respect to the Dutch CVST Study Group trial.1 Nevertheless I feel this study in combination with an earlier study by Einhäuser et al2 allows the conclusion that intravenous heparin should be first line treatment of CVST. The Dutch trial differed in several points from the German study, which may explain its neutral outcome. They are the altogether smaller number of poor outcomes; the larger proportion of patients with isolated...
intracranial hypertension and hence a much better prognosis anyway; finally a different treatment modality using subcutaneous low molecular weight heparin instead of the intravenous route.

I would agree with Bousser that heparin confers a clinically relevant benefit, justifying the use of this treatment as long as we remain unable to predict the outcome in the individual patient with CVST.


Hepatocellular carcinoma

EDITOR,—We read with interest the excellent review article on hepatocellular carcinoma. However Badvie omits to mention Budd-Chiari syndrome by Okuda and colleagues, in a case-control study reported an odds ratio of 2.3 and felt that in their study population the presence of diabetes that leads to increased susceptibility of the damaged liver to progression to hepatocellular carcinoma or whether it is the hepatocellular injury that predisposes to hepatocellular carcinoma in diabetic patients, which was greater in males compared with females.


DIARY

Falk Symposia

1/2 October 2000: Non-NEOplastic diseases of the anorectum—an interdisciplinary approach (Freiburg, Germany)
3–4 October 2000: Immunosuppression in inflammatory bowel diseases—standards, news, and future trends (Freiburg, Germany)
12/13 October 2000: Biology of bile acids in health and disease (Den Haag, The Netherlands)
4 November 2000: Chronic bowel diseases—progress and controversies at the turn of the century (Bucharest, Romania)

Details: Falk Foundation eV—Congress Division, Leinenweberset 5, PO Box 6529, D-79041 Freiburg, Germany (tel: +49 (0) 761 130 340; fax: +49 (0) 761 130 3459; e-mail: symposia@falkfoundation.de).

Columbia University College of Physicians and Surgeons, New York

28–31 July 2000: 10th Annual course. A comprehensive review of movement disorders for the clinical practitioner
30 July–5 August 2000: 5th Annual course. Update and intensive review in internal medicine

Details: Center for Continuing Education, Columbia University College of Physicians and Surgeons, 630 West 168th Street, Unit 39, New York, NY 10032, USA (tel: +1 212 781 5900; fax: +1 212 781 6047; e-mail: cme@columbia.edu).

Ninth International Symposium on celiac disease

10–13 August 2000: Hunt Valley, MD, USA
Details: Althea Pasuteri, Program Coordinator, University of Maryland School of Medicine, 655 W Baltimore Street, Baltimore, MD 21201, USA (tel: +1 410 706 3957; fax: +1 410 706 3103; http://www.celiaccenter.org).

Royal College of Physicians of Edinburgh

2–15 September 2000: Healthcare for older people—the UK experience (course)
7–8 October 2000: Stroke treatment and service delivery (consensus conference)
Details: Education, Audit, and Research Department, Royal College of Physicians of Edinburgh, 9 Queen Street, Edinburgh EH2 1JQ, UK (tel: +44 (0) 131 225 7324; fax: +44 (0) 131 220 4393; web site: www.rcpe.ac.uk).

Royal College of Physicians of Edinburgh/Scottish Intercollegiate Guidelines Network

3 November 2000: Symposium on clinical effectiveness, clinical guidelines and clinical standards
Details: Mrs Anne Fairbairn, Coordinator for Research and EBM, Royal College of Physicians of Edinburgh, 9 Queen Street, Edinburgh EH2 1JQ, UK (e-mail: a.fairbairn@rcpe.ac.uk).

Imperial College School of Medicine, Division of Paediatrics, Obstetrics and Gynaecology

27 June 2000: Caring for sexuality in health and illness (for healthcare professionals and nurses) / jointly with Association of Psychosexual Nursing
29 June–1 July 2000: New horizons in recurrent pregnancy loss
5 July 2000: Bereavement 6–7 July 2000: Advances in obstetric medicine: international meeting of obstetric medicine societies (satellite to ISSHP, Paris)
Details: Symposium Office, Imperial School of Medicine, Queen Charlotte’s and Chelsea Hospital, Goldhawk Road, London W6 0XG, UK (tel: +44 (0) 20 8383 3904; fax: +44 (0) 20 8383 8555; e-mail: sympreg@ic.ac.uk).

St Mark’s Hospital & Academic Institute

16–18 October 2000: Frontiers in colorectal disease (lecture course)
Details: The Administrator, St Mark’s Academic Institute, St Mark’s Hospital, Northwick Park, Harrow, Middlesex HA1 3UJ (tel: +44 (0) 20 8235 4046/8; fax: +44 (0) 20 8235 4039; e-mail: e.power@ic.ac.uk; web site: www.stmarkshospital.org.uk).