Is hypodermoclysis suitable for frail Chinese elderly?

LETTER TO THE EDITOR

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To the Editor—Hypodemoclysis or clysis is the infusion of fluids into the subcutaneous tissue, usually by means of a butterfly-type needle.[1] The common sites of infusion include the lateral low abdomen, chest wall, scapula, anteromedial aspect of the thigh and infraclavicular region.[2]This technique is commonly used in elderly patients for subcutaneous hydration with isotonic solutions. Hypodermoclysis is user friendly, effective, inexpensive, has a low complication rate, and can reduce the need for patient transfer to an acute care unit.[3,4] Despite the above-mentioned advantages, many physicians, nursing professionals, and nursing home staff in Hong Kong are not familiar with this technique and its many applications.[5]

We carried out an open randomised controlled study between July 2002 and January 2005 to compare hypodermoclysis and intravenous infusion ('the gold standard') for rehydration in Chinese older patients in Fung Yiu King Hospital. Rehydration was assessed both in terms of efficacy and safety. The study was approved by the Hospital Authority Ethics Committee, and supported by Tung Wah Group Hospitals Research Fund. Elderly patients aged ≥65 years were screened for eligibility and received either hypodermoclysis or traditional intravenous hydration (control). Hypodermoclysis was performed using a 22-gauge butterfly needle inserted into the subcutaneous tissue at a 30º angle to the skin surface. Only 0.9% sodium chloride or 0.45% sodium chloride with dextrose 2.5% solutions were used. The lateral low aspect of the abdomen was chosen as the site for infusion. The maximum rate of infusion for hypodermoclysis was 1.5 litres per day. The butterfly needles were replaced and the subcutaneous infusion sites changed after 48 hours or when local complications occurred. For intravenous hydration, Angiocaths with 18 to 22 gauges were employed, and the infusion sites and needles were changed after 48 hours or whenever local complications ensued. The fluids for infusion as well as the rates of infusion were the same as in hypodermoclysis. Primary outcomes were efficacy in terms of clinical improvement (general improvement or improvement of mentation or oral intake) or laboratory improvement. Laboratory parameters measured were changes in serum levels of sodium (mmol/L), and urea (mmol/L)/creatinine (umol/L) ratios, and determined in venous blood samples collected prior to starting the infusion (day 1) and on day 3 of the infusion. For secondary outcomes, the infusion sites of both groups were carefully inspected for local complications such as redness, cellulitis, large localised collections of oedema (>10-cm diameter), pain, and haematoma. The occurrence of catheter dislodgement, duration of infusion, amount of fluid given and frequencies of ad hoc catheter changes were compared. The final mortality of the two groups during that index hospitalisation was also compared.

We recruited a total of 57 patients (23 females, 34 males) who had mild to moderate dehydration requiring parenteral fluid supplementation or were unsafe to feed orally. Their mean age was 85 (SEM, 1; range, 66-104) years. Twenty-nine (15 females, 14 males) and 28 (8 females, 20 males) patients respectively were randomised to receive hypodermoclysis and intravenous hydration. Primary outcomes in terms of clinical improvement (a general improvement or improvement of mentation or oral intake) were observed in 69% and 78% of the respective patient groups (p=0.55). For biochemical

outcomes, 25 hypodermoclysis and 25 intravenous group patients had blood sampling as per protocol. In some of the other patients the infusion was stopped prior to day 3, in which case the second blood test were not available. There was a insignificant decrease in sodium levels in both the intervention and control groups. Sodium levels dropped from 144.2 ± 1.56 to 141.6 ± 1.7 mmol/L (p=0.06) in the hypodermoclysis group, while that of the intravenous group changed from 141 ± 1.9 to 140 ± 1.6 mmol/L (p=0.16). A change in urea/creatinine ratios was observed in the intravenous group (0.105 ± 0.008 to 0.098 ± 0.008, p=0.092) but the difference was not statistically significant. The hypodermoclysis group attained a significant reduction in urea/creatinine ratios (0.14 ± 0.013 to 0.119 ± 0.013, p=0.001). Between the hypodermoclysis and intravenous groups, there were no significant differences in terms of percentage of patients with complications, catheter dislodgement and death. The duration of infusions, average volume of fluid infused, and the number of ad hoc catheter changes were also similar in both groups.

Our study assessed clinical improvement and biochemical markers of hydration as the primary outcomes. We demonstrated that hypodermoclysis was as effective as intravenous hydration in terms of clinical improvement. The anticipated occurrence of more cellulitis and large collections of oedema could be deterrents to the use of hypodermoclysis by clinical staff. As demonstrated here, the absence of any difference in these complications should help to dispel the unacceptability of this modality of hydration. Our study supports the use of hypodermoclysis in frail Chinese elderly patients with poor feeding or who are unable to feed orally. We confirm that it is at least as safe and effective as the intravenous approach in these patients. We believe the use of hypodermoclysis can facilitate the practice of 'hospital in home' in Chinese patients and may even be used to avoid hospitalisation.

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