Clinical and scientific letters

OVERVIEW

Letters not directly related to articles published in *Clinical Medicine* and presenting unpublished original data should be submitted for publication in this section. Clinical and scientific letters should not exceed 500 words and may include one table and up to five references.

On-going lessons in fluid prescription: assessment of adherence to weight-based intravenous fluid prescribing in medical inpatients

Introduction

Attention to detail in the prescription of intravenous (IV) fluids for medical and surgical inpatients is often less rigorous than for other drugs, with errors in fluid volume, composition and rate being commonplace.[1–2]

As part of a review of fluid prescribing and fluid balance we introduced a weight-based fluid prescribing policy, in a large adult teaching hospital. Including algorithms, this largely mirrors the recent NICE guidance (2014).[1] Medical inpatients were prospectively assessed for adherence to local and subsequent national guidance, over four consecutive time points (May 2010, Spetember 2010, February 2013 and August 2014). Tailored education and campaigns were introduced. We report our findings, highlighting the ongoing problems in fluid prescribing.

Results

Of 298 patients assessed, 161 (54%) were prescribed IV fluids for maintenance or electrolyte correction (range 37–68%). The average age of patients on IV fluids was 63 years old (range 27–95), and junior doctors prescribed 39/67 (58%) of the total fluids. We evaluated each prescription against a weight-based fluid algorithm, adjusting for losses (Table 1). Various incorrect IV fluid regimens were implemented, with only 47–66% of IV fluids being prescribed in accordance with guidance. There was a consistent overuse of sodium-based compositions, inadequate addition of potassium, and only 70/120 (58%) of patients received a sufficient volume to meet their daily requirements. Documentation was inconsistent, with 15–42% having no indication for IV fluids written in the notes and 63–79% having no documented rationale for IV fluid composition.

Discussion

The benefit of utilising IV fluid algorithms has been previously shown in patients with sepsis, improving clinical outcomes and cost efficiency.[2] Despite algorithm availability, non-adherence to IV fluid guidelines and subsequent adverse effects on morbidity and mortality have been demonstrated in maintenance and resuscitation prescribing.[2–3]

In our study we illustrate a consistently poor adherence to local and national policy, despite the introduction of a simplified fluid algorithm and education campaigns directed at safe fluid prescribing. Barriers to adherence with fluid prescription are often cited to include the junior nature of prescribers, variable input from senior doctors, lack of awareness and existence of conflicting guidance.[2–3] In previous studies, foundation doctors prescribe around 85% of the IV fluids[4] and in our cohort they were responsible for roughly half of all fluids prescribed. Several studies have shown inadequate training at medical school and at postgraduate level, particularly in areas of electrolyte disturbance and fluid balance.[5] This has led to lack of knowledge and poor confidence in prescribing and is often compounded by indifferent attitudes to IV fluid prescription errors. To be able to improve adherence to national guidance their needs to be a change in attitude to IV fluid prescription and re-evaluation of education campaigns at both an undergraduate and postgraduate level. ■

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Table. 1. Data collected from consecutive audits from May 2010–August 2014 of patients assessed on IV fluids, highlighting the frequency of documentation, accuracy of prescribing in accordance with guidance and subsequent monitoring.

	May 2010	September 2010	February 2013	August 2014
Patients receiving IV fluids and indication				
Patients on IV fluids, n (%)	38/64 (59)	41/70 (57)	47/69 (68)	36/97 (37)
Decision to prescribe IV fluids and clinical indication recorded in case notes, n (%)	26/38 (68)	27/41 (65)	40/47 (85)	21/36 (58)
Recorded indications for IV fluids, n (%)[a]				
Dehydration	13 (50)	10 (59)	28 (70)	13 (61)
Unsafe swallow	4 (15)	4 (15)	4 (10)	2 (10)
Sepsis	4 (15)	4 (15)	3 (8)	1 (5)
Hypotension (underlying aetiology unclear)	0	1 (3)	4 (10)	1 (5)
Electrolyte abnormality[b]	4 (15)	4 (15)	1 (2)	4 (19)
Rhabdomyolysis	1 (4)	0	0	0
Anaemia	0	3 (1)	0	0
Administered IV fluid volume				
Total fluid volume infused in L, median (range)	2.5 (1–4)	2 (0.5–5)	2 (1–5)	2 (0.5–4)
Adequate volume to meet daily maintenance requirements, n (%)[c,d]	NA	26/40 (66)	21/45 (47)	23/35 (66)
Selected IV fluid regimen				
Detail and indication for selected IV fluid regimen recorded in case notes (n, %)	8/38 (21)	9/40 (23)	10/45 (37)	8/35 (23)
Excessive Na^+ load	8/38 (21)	4/40 (10)	NA	4/36 (11)
Adequate K^+ prescribed to meet daily maintenance requirements[b]	8 (21)	28 (70)	32 (71)	26 (72)
Continuation of IV fluids after 24 h				
Patients on IV fluids for >24 h, n (%)	27/38 (71)	12/40 (30)	26/47 (55)	12/36 (33)
Total number of days on IV fluids among patients receiving continuing after 24 h, median (range)	3 (2–15)	3 (2–7)	3 (2–9)	2.2 (2–10)
Daily U&E used to guide management, n (%)	19/27 (70)	7/12 (58)	13/26 (50)	8/12 (66)

[a]One patient also received 8.4% $NaHCO_3$; [b]according to RLUH Trust guidelines; [c]weight-based fluid prescribing; [d]cases without documented fluid regimes removed from analysis. IV = intravenous; NA = not available; U&E = urea and electrolytes.

References

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5 Lim CT, Dunlop M, Lim CS. Intravenous fluid prescribing practices by foundation year one doctors - a questionnaire study. *JRSM Short Rep* 2012;3:64.

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