International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 24-09-2018; Accepted: 27-10-2018
www.medicalsciencejournal.com
Volume 4; Issue 11; November 2018; Page No. 104-106

Post-operative intravenous fluid therapy in adults: Are we falling short of GIFTASUP guideline?

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Abstract
Managing perioperative patients on intravenous fluid therapy is a common medical task. Poor fluid management can result in serious morbidity due to excessive fluids or under resuscitation. The purpose of this study is to assess quality of post-operative IV fluid prescriptions and documentation of IV fluid plans in adult surgical patient against British Consensus guideline. Thirty post-operative patients were studied prospectively on fluid prescribed, occurrence of post-operative ileus, stoma or vomiting and on clear documentation of weight and monitoring of fluid status. Plasmalyte was prescribed in 89% of cases for resuscitation purpose.33% patient with post-operative vomiting had normal saline prescribed.69% patient with postoperative ileus or stoma had plasmalyte prescribed. 52% fluid balance chart and 4% clinical notes had documentation regarding weight and clinical examination respectively. It is evident that standards are not being met locally and further implementation of the GIFTASUP guideline is expected to enhance patient outcome post-operatively.

Keywords: GIFTASUP, intravenous fluid therapy, plasmalyte

Introduction
Managing patients on intravenous fluid therapy is a frequent day-to-day responsibility of junior doctors. Therefore, clear and strict prescribing of fluids is a necessary objective to achieve as part of their curriculum. Inadequate quality of fluid prescribing can lead to considerable morbidities, such as severe acute renal failure in the case of insufficient resuscitation or significant electrolyte imbalances and pulmonary oedema as a consequence of extra administration of fluids. However, latest data suggests that the quality of fluid management nationally does not compare to the expected standards.

Aims
The goal of intravenous fluid therapy in post-operative surgical patients is to restore or maintain circulation with an adequate fluid and electrolyte balance while minimising the risk of fluid related complications-such as hypovolemia which can lead to organ dysfunction and shock and fluid overload that can lead to weakening of tissue healing with increased risk of post-operative complications [1]. The purpose of this audit is to evaluate the quality of post-operative IV fluid prescriptions and documentation of assessment of fluid status and fluid plans in adult General Surgical patient against GIFTASUP guidelines on IV fluid therapy.

Audit Standards
We adopted the standards from the British Consensus guideline on intravenous fluid therapy for adult surgical patients which was published in 2008 and later updated in 2011.[2]These guidelines were published in response to the high occurrence of electrolyte and fluid imbalances and evidence to demonstrate that in order to avoid or correct this, by more strict management of fluid therapy, results in improved outcome [2].
The guidelines states that, firstly, balanced salt solutions such as plasmalyte or Hartmann's solution is to be used post-operatively when resuscitation or replacement is necessitated in order to prevent the danger of hyperchloremic acidemia. Therefore, losses from post-operative stomas and ileus are to be replaced volume for volume by Hartmann's or plasmalyte solutions. However this should not be applied in hypochloremic cases such as in cases of post-operative vomiting or gastric drainage where administration of 0.9% normal saline along with potassium replacement is recommended. Secondly, the guidelines reiterate the importance of closely monitoring the fluid status of patients with input/output fluid charts, weight assessment and clinical examination of patients [2].

Methods
In this audit, we carried out a prospective data collection of thirty inpatients on the general surgical wards who underwent either emergency or elective surgery from the 25th of March to the 8th of April 2018 at the Blackpool Victoria Hospital. The cases did not include urological, orthopaedic and day surgical patients. Data on the fluid prescribed and the occurrence of post-operative ileus, stoma or vomiting as well as on the clear documentation of weight and monitoring of fluid status in the first 48 hours post-operatively were collected from the clinical notes as well as bedside fluid balance charts and fluid prescription charts.

Results
This audit included a total of 30 inpatients. The age range of the patients varied between 26 and 83 years and there were 16

males and 14 female patients.

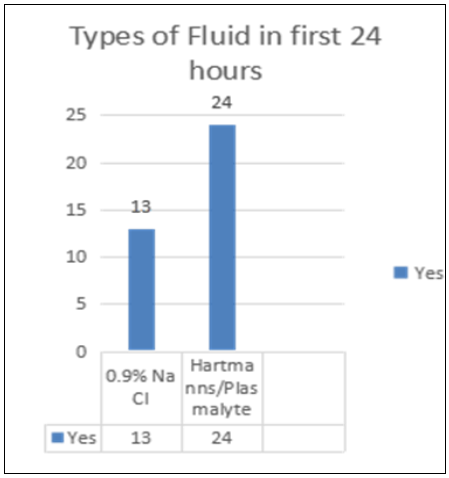

Fig 1: Type of fluids prescribed in first 24 hours.

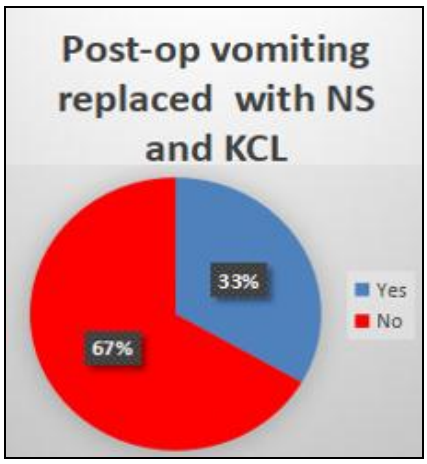

Fig 2: Post-op vomiting replaced with NS and KCL

Out of the 30 cases, balanced salt solutions such as plasmalyte was prescribed in 89% of the cases, whereas 11% of the prescriptions only had normal saline for either maintenance or resuscitation purposes. [Figure: 1]. 3 out of the total number of patients were found to have post-operative vomiting and 0.9% sodium chloride was correctly prescribed in only 33%. [Figure: 2].

Post-operative ileus or stoma was present in 13 patients audited. Plasmalyte solution was correctly prescribed in 69% of these patients as per the guidelines. [Figure 3].

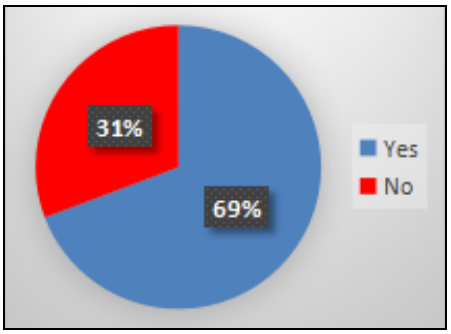

Fig 3: Post op ileus replaced with plasmalyte

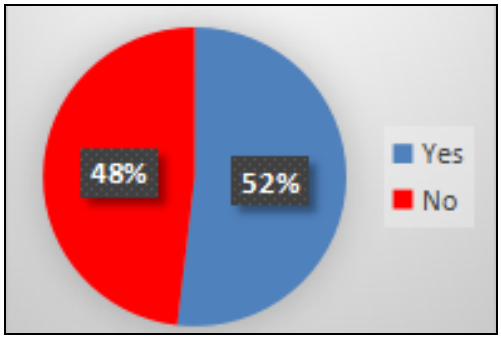

Fig 4: Documentation of weight

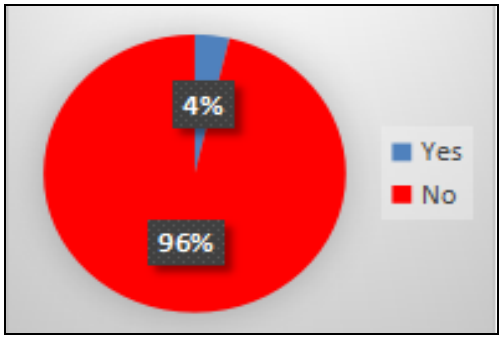

Fig 5: Documentation of clinical assessment of fluid status.

Moreover, the audit also showed that only 52% of fluid balance charts had documentation regarding weight filled in [Figure 4].Detailed documentation of a clinical examination of fluid status was only present in 4% of the clinical notes reviewed. [Figure 5]

Discussions

There have been a number of guidelines and recommendations regarding post-operative intravenous fluid therapy in recent years from the National Institute for Health and Care Excellence (2013)[3] and the British Consensus guideline on intravenous fluid therapy for adult surgical patients (2011).The standards for this audit were taken from the GIFTASUP guidelines which was published in 2008 and later updated in 2011. The audit results have demonstrated the lack of consistency and consensus on optimal approaches to post-operative fluid therapy in the surgical department at the Blackpool Victoria Hospital.

The guideline recommends the use of balanced salt solutions such as Ringer's lactate/acetate or Hartmann's solution instead of 0.9% Normal saline in routine practice for resuscitation or replacement (except in case of hypochloraemia) because of the risk of inducing hyperchloremic acidosis. Infusion of isotonic saline infusion results in hyperchloremic acidosis caused by the excess chloride cations administered. The acidosis is due to a reduction in the strong anion gap secondary to an excessive rise in plasma chloride as well as the excessive renal bicarbonate elimination [4]. The audit results has demonstrated the lack of consistency and consensus on optimal approaches to post-operative fluid therapy in the surgical department at the Blackpool Victoria Hospital. This indicates a lack of understanding of the basis of fluid prescribing among the junior doctors.

The guideline also mentions that careful monitoring should be undertaken using clinical examination (capillary refill, autonomic responses, skin turgor, dry mouth, and sunken eyes), fluid balance chart and regular weighing when possible. Clinical assessment is important to minimise fluid related complications. The NICE guideline recommends that clinical examination of any patients on intravenous fluid therapy should have regular assessment of fluid balance status which includes monitoring of pulse, blood pressure, capillary refill, and jugular venous pressure, presence of pulmonary or peripheral oedema or postural hypotension. Clinical assessment should also include regular laboratory investigations such as urea and electrolytes [3].

GIFTASUP guideline states that details of fluids administered must be clearly recorded and easily accessible [2]. The Nursing and Midwifery Council (NMC) in 2007 has published guidelines on the importance of record keeping and regarded it as a mandatory and integral part of nursing practice. It's a pre-requisite for nurses to have knowledge and understanding of importance of maintaining fluid balance chart [5].

In our study, inadequate record keeping was observed regarding weight and the clinical examination of fluid status although fluid balance charts were regularly updated by the nurses. However, good record keeping in maintaining fluid balance chart is demonstrated. Hence as depicted by this audit, the practice in BVH fails to meet the required standards on the quality of fluid management as per the GIFTASUP guidelines.

Conclusion

A key understanding of the basis of fluid prescribing is a required learning outcome for junior doctors and has shown to improve patients' therapeutic experience and to prevent significant complications. However, it is evident from the audit results that standards are not being met locally and further implementation of the GIFTASUP guidelines in everyday practice is expected to enhance patient outcome post-operatively.

Acknowledgement

We would like to thank Dr. Maisara Amran, Dr. Abisha Nevins, and Dr. Shun Shun ooi and audit department of Blackpool Victoria hospital for their generous support in this study project.

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