

IMMEDIATE DISCONTINUATION OF INTRAVENOUS FLUIDS AFTER COMMON SURGICAL PROCEDURES

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مقدمة: ما يزال الاستخدام الروتيني للمحاليل الوريدية وأنبوب المعدة بعد العمليات الجراحية بالبطن هو الشائع رغم ثبوت عدم جدوى ذلك بالعديد من الدراسات.
هدف الدراسة: بيان مدى مطابقة البحث على مرضى المجتمع السعودي وزيادة وعي الأطباء به وتشجيعهم على اتباع نفس الأسلوب.
طريقة الدراسة: أجريت الدراسة على مائة مريض بمستشفى الملك فهد الجامعي بالخبر، في الفترة من ديسمبر ١٩٩٧م وحتى يونيو ١٩٩٨م، حيث تم الاستغناء عن المحاليل الوريدية وأنبوب المعدة مباشرة بعد العملية وأعطى المريض سوائل عن طريق الفم بعد الإفاقة بفترة قصيرة.
نتائج الدراسة: أثبتت الدراسة نجاح التجربة في نسبة ٩٨% من المرضى المائة الذين أجريت لهم العمليات التالية: ٤٤ مريض استئصال الزائدة الدودية، ٣٥ مريض استئصال المرارة بالمنظار، ١٩ مريض تصليح فتق بجدار البطن ومريضين استكشاف للبطن بالمنظار. أما متوسط عمر المرضى فقد كان ٣٤,١ سنة و ٦٠% منهم كانوا رجالاً. وكان معيار النجاح هو تقبل المريض لشرب السوائل بالفم بعد فترة وجيزة من إجراء الجراحة وعدم الحاجة لاستخدام المحلول الوريدي مع خفض النفقات والاستفادة من وقت العاملين.
الاستنتاجات: الاستعمال الروتيني للمحاليل وأنبوب المعدة عقب كثير من العمليات الجراحية غير ضروري ويمكن الاستغناء عنه.
الكلمات المرجعية: الإرواء بعد إجراء العملية، الإرواء الفموي المبكر، المحاليل الوريدية بعد العملية.

Background: Intravenous (IV) fluids and nasogastric (NG) intubation can be discarded safely in some abdominal operations, but this practice seems rare in our community.

Setting: A University teaching hospital in Eastern Saudi Arabia.

Aims: To determine the feasibility of the practice in our setting and increase clinicians' awareness of it and encourage its general adoption.

Method: A prospective verification study in consecutive ASA Classes I and II adult patients scheduled for four commonly performed operations.

End Points: The practice was considered successful if the patient accepted early oral fluids and did not require re-insertion of IV line.

Results: The operations studied were appendectomy (44), laparoscopic cholecystectomy (35), herniorrhaphy (19) and diagnostic laparoscopy (2). The

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patients' mean age was 34.1 years (range 14 to 68); 60% were males. The overall success rate was 98%. Thus postoperative IV fluids proved to be unnecessary in these patients; cost savings were achieved and treating teams were freed to focus on other patients who truly required IV fluids.

Conclusions: In our setting also, routine IV fluids are unnecessary and can be discarded safely after appendectomy, cholecystectomy and herniorrhaphy in adults.

Key Words: Postoperative hydration, early oral fluids, postoperative intravenous fluids.

INTRODUCTION

The current trend in surgery is towards minimal invasiveness.¹ Its benefits include the efficient use of health professionals' time and hospital resources including perioperative intravenous (IV) fluids. It is sometimes forgotten that IV drips have side effects. The minor ones are pain, cannula site complications such as phlebitis and fluid extravasation as well as discouraged mobility, reduced sleep and increased time before diet is resumed. This latter is because: "if he has a drip, he cannot eat".² The more serious complications include volume overload, hyponatremia and relative hypotonicity with its associated increased incidence of postoperative deep vein thrombosis.³⁻⁵ Furthermore, pulmonary embolism remains one of the causes of unexpected death after cholecystectomy.⁶

In relation to abdominal operations, studies have shown the safety, efficacy and acceptability of early oral fluids while discarding routine IV fluids and nasogastric (NG) intubation. Examples are appendectomy,⁷ herniorrhaphy and open cholecystectomy,^{2,7,8} choledocholithotomy and Hartman's procedure.⁹ In addition, early oral intake was found safe after ileal and colo-rectal resection¹⁰ as well as gastrectomy and pancreaticoduodenectomy for cancer¹¹ (Table 1).

However, in our community, there seems to be a lack of awareness of these developments, or a reluctance to adopt them, or, both. The aims of this study were to determine the validity of these safe and useful adjuncts to simplifying patient care in our environment and recommend them for general adoption. We believe that the finding can be of interest not only to the treating teams but also

Table 1: A literature review regarding procedures and sample size

Year & Ref. Nos.	Procedure(s) studied	Sample size (N=)
1986 ²	Cholecystectomy	100
1987 ⁷	Appendectomy, Cholecystectomy, Herniorrhaphy	85
1991 ⁹	Cholecystectomy, Choledocholithotomy and Hartman's procedure	85
1992 ⁸	Cholecystectomy	93
1994 ¹⁰	Ileal and colorectal resection	64
1997 ¹¹	Gastrectomy and pancreaticoduodenectomy	260
1998 Al-Awad et al	Appendectomy, cholecystectomy, herniorrhaphy and diagnostic laparoscopy	100

policy makers and indeed the community at large. This paper focuses on the immediate discontinuation of postoperative IV fluids.

PATIENTS AND METHODS

A prospective study was conducted in the Department of Surgery, King Fahd Hospital of the University, Al-Khobar, Eastern Saudi Arabia. The population was the first consecutive 100 cases of adult ASA classes I and II patients scheduled for appendectomy, herniorrhaphy, cholecystectomy and diagnostic laparoscopy performed under general anaesthesia and endotracheal intubation.

An IV line was set up by the anaesthetist using any crystalloid of his choice. Nasogastric (NG) tube insertion was at the surgeon's discretion. Routine intraoperative monitoring ensured maintenance of normal cardiorespiratory variables throughout the procedure. The NG tube and the IV cannula were removed just before the patient was discharged from the recovery room to the ward. A heparin lock was fitted if required.

Serum electrolytes were estimated pre and 24 hours postoperative. The results were sequentially analysed, the mean pre and postoperative values being compared using student t-test for paired data. Ward nurses maintained routine postoperative records of vital signs. All patients were given clear oral fluids as soon as requested, and offered breakfast next morning. If a patient vomited, he was reviewed by the resident on-call, who took 1 of 3 decisions to determine success or failure of the approach. Research-in-progress meetings were held to review interim data.

END POINTS

The approach was considered successful if it was continued without modification or with minor modification using

intramuscular metoclopramide hydrochloride 10mg to control postoperative vomiting. It was considered a failure if IV infusion was resumed.

EXCLUSION CRITERIA

Excluded were: (i) common bile duct exploration or cholecystectomy combined with other procedure; (ii) gangrenous or perforated appendix; (iii) pregnancy; and (iv) patients requiring ICU admission.

Ethical considerations

Approval of the hospital-wide Research Committee was obtained.

RESULTS

The study began on 1st December 1997 and ended on 20th June 1998 when the 100th consecutive pre-agreed procedure was performed. There were 44 appendectomies, 35 cholecystectomies, 19 herniorrhaphies (13 inguinal, 6 paraumbilical) and 2 diagnostic laparoscopies. The patients' mean age was 34.1 years (range 14-68); their mean weight was 62.3 kg; 60% were males and 54% were Saudis. None required a heparin lock.

Serum electrolytes estimations were stopped after the 40th consecutive case when sequential analyses failed to show statistically significant difference between pre and postoperative mean values.

The approach was successful without modification in 86 patients. They required no IV fluids, accepted and tolerated oral hydration within 8-hours of operation, as well as breakfast the next morning. Of the remaining 14 patients, 12 (Table 2) required a review of the approach but not a re-insertion of IV line. Thus, the overall success rate was 98%.

Two patients were considered failures. One was a 27-year-old male who had appendectomy. He was fed five hours later, vomited twice, developed ileus but NG tube was not required. He tolerated oral intake

Table 2: Details of 12 patients requiring review of the approach

Operation Performed	(N=)	Nausea / Vomiting	Metaclopramide given	Tolerated		IV fluids resumed
				Oral Fluids	Breakfast	
Laparoscopic cholecystectomy	4	Vomited (x1)	No	No	Yes	No
Laparoscopic cholecystectomy	2	Nausea only	No	No	Yes	No
Laparoscopic cholecystectomy	1	Vomited (x4)	Yes	No	Yes	No
Appendicectomy	3	Vomited (x1)	No	Yes	Yes	No
Appendicectomy	2	Vomited (x4)	Yes	No	Yes	No
Total	12	-	-	-	-	-

after 48 hours during which time IV fluids were reinstated with successful outcome. The second was a 48-year-old female scheduled for laparoscopic cholecystectomy but was converted to open cholecystectomy. She vomited shortly after the operation, became hypotensive and required IV fluids with an uneventful recovery.

DISCUSSION

"Many treatments become popular for no other reason than that they are fashionable. One example is postoperative fluid therapy. The fact that it is so often prescribed gives it a semblance of physiologic respectability which implies usefulness and necessity. It is accepted by nursing staff (without question) and goes unchallenged by surgeons and anaesthetists".¹²

Several authors^{2,7-11} have shown that early oral hydration after the procedures did effectively maintain fluid balance and had advantages over conventional IV hydration (Table 1). Binderow and others¹⁰ observed that early tolerated oral intake was not unique to laparoscopic surgery. Furthermore, Gianotti et al¹¹ concluded from studying 260 patients who had gastrectomy and pancreaticoduodenectomy for cancer that: "early postoperative feeding is a valid alternative

to parenteral feeding in patients undergoing major surgery".

We examined our results in terms of sample size, end-point which excluded postoperative nausea and vomiting (PONV), and the use of consecutive series of cases. Our sample size of 100 compares favorably with others (Table 1). Of the six studies cited, four were below 100 cases.

Studies on this subject can employ a consecutive series of cases or a controlled clinical trial. We elected the former as did others.^{2,10,11} For example, in the study of 100 consecutive cholecystectomies by Blair and Janvrin,² IV cannula was used to administer anaesthetic drugs but not fluids unless indicated. Postoperatively, oral fluid was given as soon as the patient requested it and breakfast was also given the next morning. No biochemical data was provided by the authors in their paper. Presumably, none was gathered. In the present study, the measurement of serum electrolytes was stopped after sequential analysis of the first 40 cases failed to show statistically significant difference between pre and postoperative values.

Controlled clinical trials are useful but their blind and uncritical usage has been questioned. For example: "Has the time come for statisticians to look at ways of comparing uncontrolled studies and individual experiences to avoid the massive cost of

clinical trials?"¹³ We believe that in such a study, consecutive series of cases will suffice. Indeed, Salim's study⁹ was criticised as being over-elaborate in design.

We conclude that the results of our verification study confirm the safety, efficacy and acceptance of early oral hydration and the non-use of routine IV fluids after commonly performed operations in our setting. The approach was accepted without modification by 86% of patients, and the overall success rate was 98%. These patients were spared possible complications of IV fluids as well as unnecessary discomfort. Treating teams and administration were also spared the work and expense related to IV fluids. However, it remains to be seen whether this safe and cost-effective approach will enjoy the wide-spread adoption warranted by the results of this and the other studies cited.

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