

# An open randomized study of the effects of intravenous fluid replacement during day case anaesthesia

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We examined the effect of hydration on recovery from anaesthesia in 66 patients undergoing therapeutic abortion as day cases. Patients received a standard anaesthetic technique. Group 1 received 1 litre of 5% dextrose over 1 h preoperatively. Group 2 received no preoperative fluid. Patients were asked to complete a questionnaire before and after the operation to detect minor morbidity. Pain and 'well-being' scores were measured postoperatively. There was a significantly lower incidence of dizziness and thirst in group 1 postoperatively compared to group 2. Other symptoms were similar in both groups. Fluids before day-stay operations may have beneficial effects.

Key words: Day surgery, anaesthesia, preoperative fasting, intravenous fluids

## Introduction

Patients undergoing surgery are routinely starved preoperatively to minimize the risks of anaesthesia associated with a full stomach. For a long time there has been a suspicion that the well-being and recovery of patients after anaesthesia is prejudiced by dehydration and preoperative starvation. This is, perhaps, of even greater importance in day case work.

The question of perioperative fluid replacement in minor surgery has not been fully answered. However, recent studies suggest that such patients may benefit significantly from fluid replacement<sup>1–3</sup>.

## Method

The study was approved by the local District Ethics Committee. Sixty-six women undergoing therapeutic abortion as day cases were seen preoperatively and gave written informed consent. All patients were ASA 1 and aged between 17 and 30. Each patient was given a preoperative questionnaire on which she was asked to reply

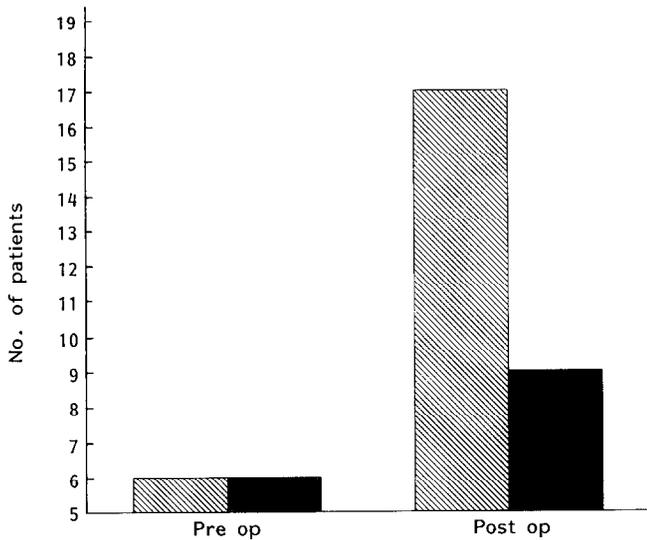
“yes” or “no” to whether she had suffered the following symptoms: dizziness; nausea; vomiting; drowsiness; headache; sore throat and thirst.

An 18 gauge intravenous cannula was placed in the non-dominant arm under local anaesthetic. Each patient was allocated randomly to one of two groups. Patients in group 1 received 1 litre of 5% dextrose intravenously over 1 h, while patients in group 2 received no fluid. Both groups received a standard anaesthetic technique for this procedure: No premedication; Fentanyl ( $1 \mu\text{g kg}^{-1}$ ) followed by a sleep dose of propofol ( $2.0\text{--}2.5 \text{ mg kg}^{-1}$ ). The patient then breathed nitrous oxide (66%) and oxygen (34%) from a Bain circuit delivered to a face mask. Anaesthesia was maintained with 25 mg incremental boluses of propofol at the discretion of the anaesthetist.

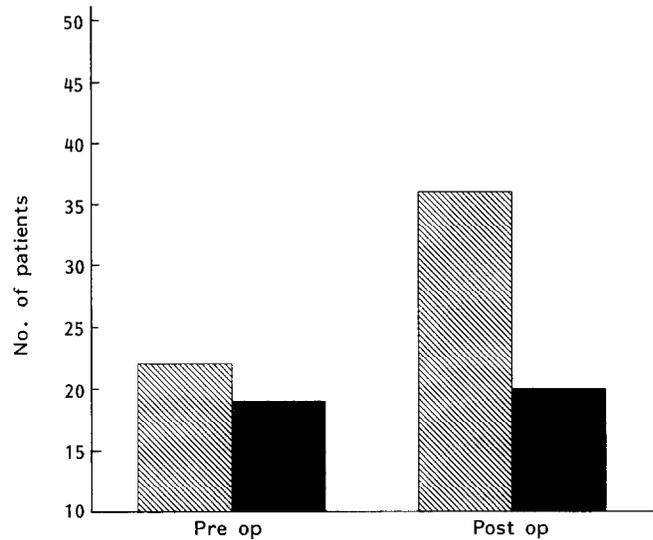
In addition, all patients received glycopyrrolate (0.1 mg) and metoclopramide (10 mg). They also received 5 iu of syntocinon prior to starting suction termination of pregnancy. Pulse rate, blood pressure, electrocardiogram, respiratory rate and oxygen saturation were monitored before induction, throughout anaesthesia and in the recovery area. Once the patient was adequately awake and able to mobilize, they were transferred to a step-down unit for further recovery. Here they were asked to complete a postoperative questionnaire which required them to indicate whether or not they had suffered the following symptoms (“yes” or “no”): dizziness; nausea; vomiting; pain; arm discomfort; sore throat and thirst. In addition, they were asked to indicate on visual

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**Figure 1.** Dizziness ( $P < 0.05$ ). ▨ No drip; ■ drip.



**Figure 2.** Thirst ( $P < 0.05$ ). ▨ No drip; ■ drip.

analogue scales how they felt when they woke up (0 = terrible, 10 = wonderful) and if they were in any pain (0 = no pain, 10 = severe pain). The two groups were compared pre- and postoperatively. Results were analysed using the  $\chi^2$  test.

**Results**

There was no significant difference between the groups in either duration of anaesthesia (7–10 min) or total propofol (150–200 mg) and total fentanyl administered.

*Dizziness*

Patients in group 1 (iv fluids) had a significantly lower incidence of dizziness ( $P < 0.05$ ) compared with those in group 2 (no fluid). There was also a significant increase in dizziness postoperatively compared with preoperatively in group 2 ( $P < 0.05$ ). However, there was no increase in incidence postoperatively in group 1 (Figure 1).

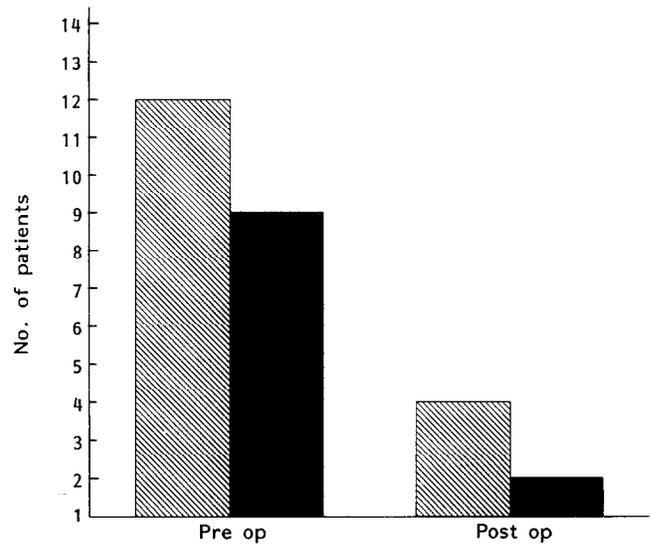
*Thirst*

There was a significantly higher incidence of thirst in group 2 postoperatively compared to group 1 ( $P < 0.05$ ). However the incidence was similar in both groups preoperatively. In addition, the incidence of this symptom increased postoperatively in group 2 when compared to preoperatively. This was not the case for group 1 (Figure 2).

*Nausea*

Both groups showed a significant decrease in this symptom postoperatively. However there was no significant difference between the groups (Figure 3).

The incidence of vomiting and arm discomfort was similar in both groups. Both groups also showed similar scores for pain and ‘overall well-being’ in the operative



**Figure 3.** Nausea ( $P < 0.05$ ). ▨ No drip; ■ drip.

period. Cardiovascular and respiratory parameters remained stable postoperatively in both groups and there were no clinically or statistically significant differences between the groups.

**Discussion**

Patients presenting for day case surgery may be starved for up to 12 h. In addition this group of patients lose blood during the procedure. The resulting depletion of intracellular and extracellular fluids (especially in warm weather) may contribute to minor morbidity postoperatively. Routine monitoring of the patients did not show any differences in cardiovascular parameters between the two groups postoperatively. However it is likely that

compensatory mechanisms would have masked any effects.

In 1986 Keane et al.<sup>1</sup> showed that there was a reduction in drowsiness and thirst postoperatively following perioperative fluid therapy. Similarly, Spencer<sup>2</sup> has provided evidence of some benefit in minor gynaecological surgery of this type of fluid replacement. Cooke et al.<sup>3</sup> assessed the effect of fluid and dextrose administration on recovery in patients undergoing day case laparoscopy. They found a lower incidence of minor symptoms (for example nausea) in those given fluid, and a lower incidence of sore throat and dizziness in those who received dextrose. However, they were unable to establish unequivocally an overall difference when a number of variables were considered. They concluded that a trend was established suggesting an advantage to fluid administration but further studies were required.

Recently, Ooi et al.<sup>4</sup> examined the effect of hydration on immediate recovery from anaesthesia in two groups of 15 patients undergoing therapeutic abortion. They assessed subjective symptoms using a questionnaire. In addition, they used objective tests of psychodynamic function and reaction times. In this study they were unable to demonstrate any obvious benefit of intravenous fluid administration.

Our findings of a lower incidence of dizziness and thirst in patients receiving intravenous fluid and dextrose support those of previous studies<sup>1-3</sup>. Nausea is common in early pregnancy. In our study, we showed a decrease in nausea in both groups postoperatively with no difference between the groups. This is contrary to the findings of Cook et al.<sup>3</sup>. All our patients received metoclopramide on induction, however, and propofol is associated with a good quality of recovery and a low incidence of nausea.

Pain scores were similar for both groups. This procedure is not normally associated with severe postoperative pain and all patients received fentanyl on induction. Ooi et al.<sup>4</sup> noted in their study that the emotional overlay of therapeutic abortion may effect the results of both subjective and objective tests of recovery. This may be why there was no obvious difference in overall well-being between the groups. We must also consider the sensitivity of our tests in detecting such differences.

Day surgery is generally well accepted by patients for minor and intermediate surgery where modern anaesthetic techniques and minimally invasive surgery are associated with rapid patient mobilization. So called 'minor' side effects such as nausea and dizziness are therefore perceived as of greater importance by such patients. Our findings do lend support to the view that intravenous fluids before operation may have a beneficial effect on minor postoperative morbidity, however there are other issues to be considered. In our day case unit, patients are

allowed to be mobile prior to operation and many patients found the intravenous infusion inconvenient. In addition previous studies have commented on the cost effectiveness of administering intravenous infusions routinely to all day case patients<sup>4</sup>.

A recent study by Phillips et al.<sup>5</sup> compared the effect of allowing elective surgical patients to drink clear fluids until 2 h before anaesthesia with conventional fasting. There was no increase in either gastric volume or pH in the study group compared with the control group. Other studies have shown that modest oral fluid administration before premedication is tolerated well<sup>6</sup>. However, Goodwin et al.<sup>7</sup> found no significant difference in the incidence of pain, nausea or headache in 100 day surgical patients undergoing first trimester termination of pregnancy, who were randomly allocated to receive either 150 ml of clear fluid 1.5-2 hours before anaesthesia or to fast from midnight the night before. Further work needs to be performed to determine which of these two approaches offers the best option for day case surgery.

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#### References

- 1 Keane P, Murray P. Intravenous fluids in minor surgery. Their effect on recovery from anaesthesia. *Anaesthesia* 1986; **41**: 635-7
- 2 Spencer E. Intravenous fluids in minor gynaecological surgery. Their effect on postoperative morbidity. *Anaesthesia* 1988; **43**: 1050-1
- 3 Cook R, Anderson S, Riseborough M, Blogg CE. Intravenous fluid load and recovery. A double blind comparison in gynaecological patients who had day case laparoscopy. *Anaesthesia* 1990; **45**: 826-30
- 4 Ooi LG, Goldhill DR, Griffiths A, Smith C. IV fluids and minor gynaecological surgery effect on recovery from anaesthesia. *Br J Anaesth* 1992; **68**: 576-9
- 5 Phillips S, Hutchinson S, Davidson T. Preoperative drinking does not effect gastric contents. *Br J Anaesth* 1993; **70**: 6-9
- 6 Maltby JR, Koehli N, Ewen, A, Shaffer EA. Gastric fluid volume, pH and emptying in elective inpatients. Influences of narcotic-atropine premedication, oral fluid and Ranitidine. *Can J Anaesth* 1988; **35**: 562-6
- 7 Goodwin APL, Rowe WL, Ogg TW, Samaan A. Oral fluids prior to day surgery: The effect of shortening the preoperative fluid fast on postoperative morbidity. *Anaesthesia* 1991; **46**: 1066-8