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ORIGINAL ARTICLE

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Introduction of enhanced recovery for elective caesarean section enabling next day discharge: a tertiary centre experience

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ABSTRACT
Background: The widespread adoption of enhanced recovery programmes in various surgical specialties has resulted in patient benefits including reduced morbidity, reduced length of stay and an earlier return to normal activities. This evidence, along with the increased financial pressures in the UK National Health Service, has led many units to consider introducing such a programme for obstetric surgery. We report our experience in setting up an enhanced recovery programme for women undergoing elective caesarean section and a prospective analysis of factors that influence length of stay.
Methods: An enhanced recovery pathway was designed by a multidisciplinary team and introduced in March 2012. Factors influencing length of stay were determined using a log normal model.
Results: The proportion of women discharged on Day 1 increased from 1.6% in the first quarter of 2012 to 25.2% in the first quarter of 2014. The 30-day readmission rate was 4.4% for those discharged on Day 1 and 5.6% for Day 2. Earlier gestation, multiple birth, intention to breast feed, longer surgery and more time in the post-anaesthesia recovery unit were all independently associated with a longer postoperative stay. Women presenting for obstetric surgery with the indication "one previous caesarean section" were more likely to leave hospital earlier compared to most other indications.
Conclusion: An enhanced recovery programme was successfully introduced into our unit. Many of the interventions were straightforward and could be adopted easily elsewhere.

Keywords: Enhanced recovery; Elective; Caesarean section

Introduction

The concept of an enhanced recovery programme, otherwise known as fast-track surgery, following elective surgery was developed more than 10 years ago.[1] The aim of enhanced recovery is to optimise multiple aspects of patient care, improve recovery, and facilitate earlier discharge without reducing patient satisfaction or the quality of care.[2–6] Much of the work establishing the benefits of enhanced recovery has been conducted on patients undergoing colorectal surgery, but the same concepts have since been used in gynaecology, urology and orthopaedics.[7] Widespread adoption is related to mounting evidence that implementation of enhanced recovery programmes results in reduced patient morbidity, reduced length of stay and earlier return to normal activities.[2,7]

Until recently there has been little interest in enhanced recovery for obstetric surgery. However, next-day discharge is in keeping with National Institute for Health and Care Excellence (NICE) guidance which states that "women who are recovering well, are apyrexial and do not have complications following caesarean section (CS) should be offered early discharge (after 24 h) from hospital and follow-up at home, because this is not associated with more infant or maternal readmissions."[8] Pressure on National Health Service (NHS) budgets has resulted in increased support for earlier discharge for women following CS.[9,10] Caesarean section is one of the commonest surgical procedures performed by the NHS, and most patients are discharged at least two days post-surgery.[11] Earlier discharge on the day after surgery could result in significant cost savings for obstetric units.

A survey in our unit of 58 women who were discharged on Day 2 or later after elective CS found that 46% would have preferred to go home at least a day earlier. We introduced fast-track surgery for this patient group, and now report our experience and an analysis of factors that may determine length of stay following elective CS.

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Methods

The Jessop Wing Obstetric Unit is a tertiary referral centre with approximately 7000 deliveries per annum. Patients presenting for elective CS are pre-assessed at least one day beforehand, and then admitted on the day of surgery. There are nine operating lists for elective obstetric surgery each week, run independently of emergency work. Following surgery patients are monitored by trained recovery nurses in the post-anaesthesia care unit (PACU), before transfer to the postnatal ward where they remain until discharge.

A multidisciplinary team was convened to introduce enhanced recovery for elective CS to the unit. The team included anaesthetists, obstetricians, hospital and community midwives, breastfeeding specialists, a patient representative, a senior neonatal nurse and a pharmacist. Patients were surveyed about the proposed changes and their attitudes to earlier postoperative discharge. There were four multidisciplinary meetings between March and September 2012. Following the first meeting, midwives were encouraged to allow next-day discharge for patients in whom recovery was straightforward.

Features for planned CS that were already consistent with fast-track surgery included a generally young and fit patient population, and minimal interruption of oral intake. The standard anaesthetic technique was a subarachnoid block with spinal diamorphine (94% of patients) and postoperative analgesia consisted of regular paracetamol and ibuprofen with liquid oral morphine for breakthrough pain. Innovations included new perioperative information for patients and staff (May 2012, Appendix A), a high calorie preoperative non-fizzy sports drink for non-diabetic patients (March 2013) and active warming using under-patient forced air warmer/heated mattress in theatre (December 2013). Guidelines for maternal/neonatal skin-to-skin contact in theatre were already in place but poorly applied, so there was a fresh initiative to encourage adoption. A guideline for delayed cord clamping in theatre was also produced. Management of postoperative nausea and vomiting was at the discretion of the anaesthetist, and patient mobilisation and removal of urinary catheters on the morning after surgery continued unchanged. The changes to the perioperative pathway (Table 1) were introduced for all patients, and midwifery staff made a decision on suitability for early discharge based on individual postoperative recovery.

The project was registered as a service evaluation with the Sheffield Teaching Hospitals Trust (STHT) Clinical Effectiveness Unit. Data were gathered from the STHT perioperative database (ORMIS), the obstetric unit database (JMIS) and the obstetric anaesthesia and haematology databases. All perioperative timings were recorded in ORMIS contemporaneously by theatre and post-anaesthesia recovery staff.

Statistical analysis

A range of variables determined by a consensus of the investigating team were collected for the calendar year 2013. Some variables were recoded to allow for larger group sizes when performing the analysis. Any missing information for the indication for CS was grouped into "other". The number of neonates was coded as single or multiple. Apgar scores at 1 and 5 min were combined into a single variable and presented as groups and recoded as "normal" ($\geqslant$7 at 1 and 5 min), "early abnormal only" ($<$7 at 1 min and $\geqslant$7 at 5 min) or "abnormal" ($<$7 at 1 and 5 min). Parity was recoded as no previous pregnancies or one or more previous pregnancies. Method of neonatal resuscitation was recoded as "no resuscitation" or "some resuscitation" due to the small number of babies that received resuscitation. Pre- and postoperative haemoglobin (Hb) levels were combined

Table 1 Different aspects of perioperative care for the enhanced recovery protocol

Aspect of perioperative pathway	Management for enhanced recovery
Patient selection	All patients presenting for elective CS
Patient information	New preoperative patient information document produced
Preoperative fluids	Clear fluids up to 2 h before surgery
Carbohydrate drink	Non-fizzy sports drink up to 2 h before surgery
Intraoperative fluid balance	At discretion of perioperative team
Surgical technique	At discretion of surgeon
Patient warming	Active under-patient warming
Postoperative mobilisation and removal of urinary catheter	The morning after surgery
Perioperative analgesia	Spinal diamorphine, regular paracetamol, NSAIDS with oral morphine for breakthrough pain
Prevention of postoperative nausea and vomiting	At discretion of perioperative team
Postoperative clear fluids	Within 30 min of the end of surgery
Postoperative food	One hour after surgery
Neonate	Delayed cord clamping and skin-to-skin contact in theatre encouraged

CS: caesarean section; NSAIDS: non-steroidal anti-inflammatory drugs.