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ORIGINAL ARTICLE

Persistent pain after caesarean section and its association with maternal anxiety and socioeconomic background

B. Daly,^a S. Young,^a R. Marla,^b L. Riddell,^a R. Junkin,^a N. Weidenhammer,^a J. Dolan,^a J. Kinsella,^b R. Zhang^c

^aDepartment of Anaesthesia, Glasgow Royal Infirmary, Glasgow, Scotland, UK

^bAcademic Department of Anaesthesia, The New Lister Building, University of Glasgow, Glasgow, Scotland, UK

^cRobertson Centre for Biostatistics, University of Glasgow, Glasgow, Scotland, UK

ABSTRACT

Background: Pain, both from the surgical site, and from other sources such as musculoskeletal backache, can persist after caesarean section. In this study of a predominantly socially deprived population we have sought to prospectively examine the association between antenatal maternal anxiety and socioeconomic background and the development of persistent pain of all sources after caesarean section.

Methods: Demographic details and an anxiety questionnaire were completed by 205 women before elective caesarean section. On the first postoperative day, pain scores were recorded, and at four months patients were asked to complete a Brief Pain Inventory and an Edinburgh Postnatal Depression Score.

Results: Of 205 parturients recruited, 186 records were complete at the hospital admission phase and 98 (52.7%) were complete at the four-month follow-up phase. At recruitment, 15.1% reported pain. At four months 41.8% (95% CI 32.1 to 51.6%) reported pain, of whom pain was a new finding in 35.7% (95% CI 26.2 to 45.2%). Antenatal anxiety was not a significant predictor of severity of new pain at four months ($P=0.44$ for state anxiety, $P=0.52$ for trait anxiety). However, four-month pain severity did correlate with social deprivation ($P=0.011$), postnatal depression ($P<0.001$) and pain at 24 h ($P=0.018$).

Conclusion: Persistent pain from a variety of sources after caesarean section is common. Our findings do not support the use of antenatal anxiety scoring to predict persistent pain in this setting, but suggest that persistent pain is influenced by acute pain, postnatal depression and socioeconomic deprivation.

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Keywords: Pain; Persistent; Chronic; Caesarean section; Anxiety; Socioeconomic deprivation; Postnatal depression

Introduction

Pain is complex, multidimensional and subjective. In 1994 The International Association for the Study of Pain described it as “an unpleasant sensory and emotional experience”. When pain occurs immediately, and for a short duration after a defined tissue injury such as surgery, it is defined as “acute”, with the expectation that after a given length of time the tissue heals and the pain resolves. Pain failing to resolve can then be classed as persistent (chronic). The point at which the nomenclature changes is somewhat arbitrary, with both two and three months being quoted.^{1–3} Chronic post-surgical pain (CPSP) has been studied across the surgical spectrum, with extremely high incidences in some

operations such as amputation (50–88%) and lower in others such as hip replacement (12%). Projecting these figures across populations suggests that up to 100 000 UK and 1.5 million USA cases of CPSP are generated annually.³ Even if the incidence of pain is low, if an operation is performed frequently, the absolute number of cases of CPSP will be high. So it is with caesarean section which is often quoted as the commonest surgical procedure worldwide, and one whose increasing use has prompted concerns over short and long term population morbidity.⁴

The incidence of persistent pain after caesarean section varies according to definition and study design. A retrospective Scandinavian study found an incidence of 12.3% at 10.2 months using “scar pain” as the end point,⁵ whilst Kainu et al.¹ questioning Finnish women at 12 months postnatally found 18% continued to experience “wound-site” pain. A prospective USA study

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Correspondence to Dr S Young, Department of Anaesthesia, Glasgow Royal Infirmary, 84 Castle Street, Glasgow, Scotland G4 0SF, UK.

E-mail address: steven.young@ggc.scot.nhs.uk

found an incidence of 9.8% at eight weeks,⁶ which interestingly was similar after caesarean and vaginal delivery; the authors linked severe acute postpartum pain with a 2.5-fold increased risk of developing persistent pain and a three-fold increased risk of postnatal depression. This relationship between poorly controlled acute pain and persistent pain is well described across the surgical specialties.⁷

Other potential influences are less well elucidated. Whilst there is a recognition that psychosocial factors are important, the evidence is mainly in the acute setting, for example anxiety influencing acute postoperative pain.⁸ Authors have recognised the difficulty of separating the anxiety experienced preoperatively from a patient's normal psychological status.⁹

The primary outcome of the present study was to define the incidence of new persistent pain after elective caesarean section in a predominantly socially deprived urban Scottish population. Importantly, we defined new persistent pain as pain from any source present from the time of hospital discharge. This design allowed for capture of any pain source, for example musculoskeletal, which may cause interference with a patient's daily activities and is a broader definition than those used in previous studies. The main secondary outcome was correlating antenatal anxiety with persistent pain (as defined above). Additional variables studied were: acute pain, socioeconomic status and postnatal depression.

Methods

The design was a prospective longitudinal observational cohort study. The study was approved by the West of Scotland Research Ethics Committee and was pre-registered in the ANZCTR trial registry (ACTRN12610000926033). Informed written consent was obtained from each participant. Parturients scheduled for elective caesarean section were given a study information leaflet the week before their scheduled date, and approached on admission to hospital and invited to participate by a researcher independent of the usual anaesthetic team. Exclusion criteria were: parity >2; unable to understand written English; and unable to give legally valid consent.

A standardised anaesthetic technique was used. This incorporated spinal anaesthesia with hyperbaric 0.5% bupivacaine at a base dose of 2.5 mL, which could be varied at the discretion of the attending anaesthetist between 2.25–2.75 mL. All participants received intrathecal diamorphine 0.3 mg. Surgery was commenced after a sensory block to at least the T4 dermatome bilaterally to cold, associated with a complete motor block at the hips, was demonstrated. Fluid and vasopressor use was at the discretion of the attending anaesthetist, as was the management of inadequate

blockade; however, as this was entirely elective surgery, the expectation for supplementation of anaesthesia or conversion to general anaesthesia was low. A standard surgical approach was used with transverse skin and uterine incisions, and a standardised layered closure technique.

Data collection was in three phases: on admission to the hospital on the morning of surgery with a researcher, 24 h after surgery with a researcher, and at four months after surgery by self-completed postal questionnaire.

In the first phase, performed in a quiet, spacious preoperative waiting area between 0830 h and 0900 h in the presence of the patient's birth partner, recruited subjects were asked to complete a Spielberger State-Trait Anxiety Inventory (STAI).¹⁰ This tool seeks to separately define the degree of anxiety at the time of completing the score (state) and how anxious the subject is normally (trait). Each section has 20 items that the subject scores on a four-point Likert scale, giving a score in a range 20–80. The higher the score, the higher the anxiety, with a cut-off point of 39–40 suggested as indicating clinically significant symptoms. Also, at this time patients were asked whether they had any pre-existing pain (yes/no) or were currently using analgesics (yes/no). In addition, baseline demographic data were collected: postal code (which subsequently was converted to an area-based deprivation score using the Scottish Index of Multiple Deprivation (SIMD 2012),¹¹ age, parity, duration of surgery and grade of operating surgeon.

The SIMD 2012 ranks the postal code areas of Scotland by deprivation status from highest deprivation to lowest (the lower the rank number, the more deprived the area). As this is an area deprivation score, it does not account for situations where for example a wealthier person is living in a high deprivation area; however, it is commonly used and recognised as a useful tool for demographic study. The SIMD is a composite score of data from domains of income, employment, health, education, housing, access and crime.

At 24 h after surgery, participants were visited by a researcher and asked to mark a 100-mm visual analogue scale (VAS) score to record acute postoperative pain level.

In the last phase of the study, a postal questionnaire was sent out with a prepaid addressed reply envelope to the participant's registered home address at four months post-delivery. This comprised of a Brief Pain Inventory (BPI)¹² and an Edinburgh Postnatal Depression Score (EPND).¹³ The BPI scoring system measures the presence of pain by a number of questions ranked from 0–10 for severity, and separately for interference with daily life. Each subject's score was calculated as an average of the score for each question, giving a possible range of 0–10. Presence of pain at four months was defined as a score >0 on the severity scoring questionnaire. The BPI also includes a pictogram of a human body for

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