Accidental dural puncture in obstetric patients and long term symptoms

C MacArthur, M Lewis, E G Knox

Abstract

Objective—To examine the association between accidental dural puncture and long term headache and related symptoms.

Design—Postal questionnaire survey to elucidate new symptoms occurring after childbirth, and linking of these to data in obstetric and anaesthetic case notes. Women were surveyed between 13 months and nine years after delivery.

Setting—Birmingham Maternity Hospital.

Subjects—4700 women who had delivered their most recent baby under epidural anaesthesia, 74 of whom had suffered an accidental dural puncture.

Main outcome measures—Frequencies of new headache or migraine or neck ache starting within three months after childbirth and lasting over six weeks.

Results—Among the 74 women who had had an accidental dural puncture there were 17 (23%) who reported one or more of the above symptoms. By comparison, among those who had had an epidural anaesthetic but no recorded puncture, only 329 (7.1%) reported these symptoms. The duration of the headache or migraine or neck ache in the dural tap group ranged from nine weeks to over eight years. Ten of these women reported still unresolved symptoms.

Conclusions—Conclusions on causality were tentative. Most women would remember a dural tap, and this might influence their reporting of subsequent symptoms attributable to the event. In addition, detailed characterisation of the symptoms was not available. Nevertheless, the findings provide a clear indication of the need for further study of the possible long term sequelae of accidental dural puncture.

Introduction

Postdural puncture headache has long been recognised as a complication of both spinal and epidural anaesthesia and has been recorded in several studies of patients having an obstetric epidural anaesthetic.¹⁻⁴ Accidental dural puncture is thought to occur in around 1% of cases^{5,6} and is associated with the experience of the anaesthetist, the needle size, and the method used for identifying the epidural space.^{1-3,7}

Postdural puncture headache is generally distinctive, postural, and frontal; is relieved when the patient is supine; frequently affects neck and shoulders; and may be accompanied by auditory or visual symptoms or nausea.⁸ Symptoms do not always occur after accidental dural puncture, but when they do they are usually reported within the first two days.^{9,10} Crawford found that the headache could last for up to six days, with some residual "muzziness" for a further day or two.¹ However, patients have not been routinely followed up for long term symptoms after discharge

from hospital, although there have been one or two case reports.^{11,12}

We have reported an association between epidural anaesthesia and a range of long term symptoms, including frequent headache,^{13,14} but without specific reference to dural puncture. Those findings were based on symptoms reported by women after childbirth and linked to their obstetric records. We subsequently linked additional information from the anaesthetic records of the same women and in this paper describe the long term symptoms reported by those who had had an accidental dural puncture.

Subjects and methods

The method relating to the first part of this investigation has been described.^{13,15} Briefly, all women who had delivered in Birmingham Maternity Hospital between 1978 and 1985 were identified (n=30 096) and their delivery related characteristics obtained from the computerised records. The women were sent postal questionnaires asking about their experience of a list of 25 symptoms starting after the birth of their most recent child, and there were 11 701 replies. We contacted women using addresses given at the time of birth, as the local family health services authority refused access to their records for tracing. Using post office and electoral register sources, we estimated a response rate of 78% from among those who received their questionnaires.^{13,15} The questionnaires were sent in January 1987, 13 months to nine years after the delivery, and allowed the reporting of long term problems. Only accurately dated new symptoms starting within three months of the delivery and lasting over six weeks were included.

Of the 11 701 respondents, 4766 had had epidural anaesthesia either for labour or for caesarean section. The obstetric case notes merely recorded the types of analgesia and anaesthesia used. The study hospital, however, kept a separate set of anaesthetic notes for women who had had epidural anaesthesia which recorded technical details of each anaesthetic together with the results of daily inpatient follow up by the anaesthetic staff. These case notes systematically recorded accidental dural puncture, and it was the practice in the hospital to inform the woman if this complication had occurred.

The anaesthetic records were linked to the main obstetric record and to the questionnaire information for each woman. Sixty six anaesthetic records could not be located, so that the information in this report relates to the 4700 cases with fully linked anaesthetic, obstetric, and questionnaire data.

Results

ACCIDENTAL DURAL PUNCTURE

Among the 4700 women given an epidural anaes-

Department of Public Health and Epidemiology, Medical School, University of Birmingham, Birmingham B15 2TJ

C MacArthur, senior research fellow
E G Knox, professor

Department of Anaesthetics, Birmingham Maternity Hospital, Birmingham B15 2TJ
M Lewis, consultant anaesthetist

Correspondence to: Dr MacArthur.

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thetic, 74 (1.6%) sustained an accidental dural puncture. As in other series, there were statistically significant associations between the occurrence of accidental puncture and the total number of epidural anaesthetics performed by the anaesthetist and the method used for identifying the epidural space. The greatest proportion of taps occurred with use of the MacIntosh balloon technique (table I).

LONG TERM SYMPTOMS

Information on the occurrence and duration of longer term symptoms was available from the postal questionnaires returned by the women. The 74 who had suffered an accidental dural puncture were compared for all 25 symptoms listed on the questionnaire with those who had had an epidural anaesthetic but not suffered a dural puncture. Table II shows the statistically significant associations, together with the symptom rates in women who had not received an epidural anaesthetic. Frequent long term headache or migraine and neck ache were reported significantly more often by women who had had a dural puncture than in the other groups. Shoulder ache was also more frequent, but not significantly so ($\chi^2=3.33$), and all those reporting shoulder ache after dural puncture had had headache as well. None of the other symptoms on the questionnaire were significantly associated with accidental dural puncture. Visual disturbances and auditory symptoms are shown in table I because they have been recorded as short term effects of dural puncture.¹⁶ Numbers, however, were too small to warrant comment.

Some women had had long term headache as well as neck ache, so that a total of 17 women reported one or both of these symptoms (table II). Our definition of relevant long term symptoms used strict inclusion criteria (accurately dated symptoms not previously experienced, lasting over six weeks), and three of the four women defined as having long term neck ache but not meeting the criteria for headache had nevertheless mentioned headache. One woman could not recall the duration of her headaches, one reported a headache lasting only three weeks, and another had experienced headaches before. The only woman who had not

TABLE III—Duration, persistence, and medical consultation in each woman who reported long term symptoms after accidental dural puncture

Case No	Duration of symptom(s) (weeks)	Symptom(s) still present	Consulted doctor	Had treatment from doctor
1	9	No	No	—
2	13	No	No data	No data
3	13	No	No	—
4	26	No	No	—
5	36	No	Yes	Yes
6	52	No	Yes	Yes
7*	65	Intermittent	Yes	Yes
8	61	Yes	Yes	Yes
9†	78	Yes	No	—
10	82	Intermittent	No	—
11	100	Yes	Yes	Referred
12	104	No	No	—
13	113	Yes	No	—
14‡	278	Yes	No	—
15	390	Intermittent	Yes	Yes
16	412	Yes	No data	No data
17	433	Yes	Yes	Referred

All patients unless otherwise stated, had symptoms starting within the first week.

*Patient had accompanying auditory symptoms.

†Headache started in week 3 but patient also reported neck ache and shoulder ache starting immediately and lasting four weeks.

‡Migraine-type headaches started in week 4.

mentioned headache had reported neck ache with shoulder ache.

Although symptoms were defined as "long term" if they had lasted for more than six weeks, most had lasted much longer. Among the 17 women reporting headache or neck ache, 11 (65%) had had these symptoms for over a year and 10 still had them at the time of questioning. In three cases the symptoms had resolved within three months, in one they had lasted for six months, and in two cases they had persisted between six months and a year. A further eight women reported headache after dural tap, which, though not defined as long term according to our criteria, persisted for three weeks in four cases, four weeks in three cases, and six weeks in one.

No information was obtained on the severity of symptoms, but the women were asked whether they had consulted a doctor and received treatment. Of the 17 women with headache or neck ache, seven had consulted, eight had not, and two did not answer. All seven who consulted said they received treatment, usually painkillers, and two were referred for specialist consultation.

Discussion

This study has shown that in a series of 74 cases of accidental dural puncture that occurred among 4700 women given an epidural anaesthetic, 17 women (23%) reported one or more of headache or migraine or neck ache starting afterwards and lasting for more than six weeks. In 10 cases symptoms remained unresolved at the time of questioning 15 months to eight years later. These symptoms after accidental puncture are well known but generally regarded as short lived and self limiting.¹⁸⁹ There have been some case reports of long term sequelae,^{11 12} but we know of no systematic investigation of long term symptoms after accidental dural puncture.

Our information about symptoms lacked detail. As the study was part of a much larger investigation of a range of long term health problems after childbirth, we could not focus on details of particular symptoms. We inquired only which women had reported each symptom, when it had started, how long it had lasted, and whether the women had sought medical consultation or received treatment. We obtained no information on the specific nature of the headaches—that is, their characteristics or severity or frequency of occurrence. Some women noted on the questionnaire that their symptoms, although unresolved, were only inter-

TABLE I—Characteristics associated with accidental dural puncture

	No (%) of cases of dural puncture	Total patients
No of previous epidural anaesthetics given:		
< 10	13 (2.5)	515
10-29	20 (2.0)	1014
30-59	11 (1.4)	794
60-89	6 (1.2)	505
≥ 90	23 (1.3)	1809
No information	1 (1.6)	63
Identification method:		
MacIntosh balloon	26 (2.0)	1333
Loss of resistance/air	38 (1.6)	2308
Loss of resistance/fluid	8 (0.8)	1043
Other		14

TABLE II—Long term symptoms in women with accidental dural puncture and in comparison groups. Figures are numbers (percentages) of women

Long term symptoms	Dural puncture (n=74)	Epidural anaesthetic, no puncture (n=4626)	No epidural anaesthetic (n=6935)
Frequent headache or migraine*	13 (17.6)	251 (5.4)†	245 (3.5)
Neck ache	8 (10.8)	108 (2.3)†	112 (1.6)
Women with any of above symptoms	17 (23.0)	329 (7.1)†	333 (4.8)
Shoulder ache	5 (6.8)	121 (2.6)	137 (2.0)
Visual disturbances	2 (2.7)	80 (1.7)	91 (1.3)
Auditory symptoms	1 (1.4)	28 (0.6)	46 (0.7)

*Headache was described as "migraine" by one, 46, and 46 women in the three groups respectively.

†Difference from dural puncture group: $p < 0.001$ (χ^2 test with Yates's correction).

mittent (see table III). We need more information on symptom details.

Report bias must also be considered. Most women have headache at some time. We asked about "frequent headaches," but after a dural tap a woman's perception of the term might be influenced by events in the puerperium, particularly if she had experienced or been warned about the possibility of headache. Thus infrequent and mild headache might be overreported by this group. Response bias is also relevant. Although our estimated 78% response rate was high, non-respondents were likely to include more of the women who had dural taps without subsequent problems. All forms of bias demand further investigation before causal inferences can be drawn.

Mechanisms to account for prolonged headache have been considered for spinal anaesthesia. Vandam and Dripps investigated long term symptoms after 10 098 spinal anaesthetics and suggested that vascular changes may occur or that the headache, after being initiated by cerebrospinal fluid drainage, might be perpetuated by the stress of everyday life.¹⁶ Abouleish suggested that the dural tear might not repair adequately, with a resulting fistula and possible continuous leakage of cerebrospinal fluid, complicated subsequently by psychological, vascular, and muscular factors.¹⁷ The larger gauge needles used for epidural as compared with spinal anaesthesia might mean that inadequate or delayed repair is more likely.

Prolonged headache after accidental dural puncture was initially considered extremely unlikely.¹⁸ More recent case reports suggest that they might occasionally occur.¹² Our study suggests that long term symptoms occur more often than this. The limited data on characteristics of the symptoms and the reliance on lengthy recall in our study demand an extremely

cautious consideration of a possible causal relation but make it very clear that the topic requires further investigation.

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Factors affecting quality of informed consent

Christine Lavelle-Jones, Derek J Byrne, Peter Rice, Alfred Cuschieri

Abstract

Objective—To examine the factors influencing quality of informed consent.

Design—Prospective study comprising interviews with patients and patients' completing standard questionnaires.

Setting—Academic surgical unit of large teaching hospital.

Patients—265 patients undergoing intrathoracic, intraperitoneal, and vascular surgical procedures. Of these patients, 192 have been followed up for six months.

Main outcome measures—Patients' recall of information at various points in the study; this score was compared by age, provision of written information, cognitive function, intelligence quotient (IQ), mood state and personality traits, and health locus of control.

Results—The patients were best informed immediately after signing the consent form and from then on recall of information deteriorated. A total of 172/250 (69%) patients admitted to not reading the consent form before signing it. Old age adversely affected recall of information at all assessment points. Impaired cognitive function reduced information recall only during the stay in hospital. Patients with above average IQs handled information better than those with a lower IQ except immediately after the signing of consent forms.

Patients with an internal locus of health control (that is, those who believed their health to be in their own control) were better informed than those with an external locus of health control. Operation information cards improved recall only on the day of discharge.

Conclusion—Elderly patients and patients with below average IQ, impaired cognitive functions, and an external locus of control have poor information recall. Written information may be more useful if given before admission to hospital.

Introduction

Informed consent is a legal requirement for all surgical procedures. Despite this a substantial number of patients are unaware of important details concerning their surgery.^{1,2} A few studies have reported on the effect of written as opposed to oral information on the quality of informed consent,^{2,3} but no investigation has assessed the relation of characteristics of individual patients to the appreciation and recall of specific information relating to treatment. Effective strategies to improve this may need to be different in various groups as understanding and recall of medical information may be influenced by age, intelligence quotient (IQ), cognitive function, and factors in the patient's mood or personality. We studied prospectively the effect of these variables on recall of medical informa-

Departments of Surgery and Psychiatry, Ninewells Hospital and Medical School, University of Dundee, Dundee DD1 9SY
Christine Lavelle-Jones, research assistant, department of surgery
Derek J Byrne, senior surgical registrar
Peter Rice, consultant psychiatrist
Alfred Cuschieri, professor of surgery

Correspondence to: Professor Cuschieri.

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