Key messages

- Around half of patients presenting to general medical outpatient clinics have no detectable organic abnormalities that could account for their symptoms
- If psychological therapy is offered in the medical clinic most patients with unexplained physical symptoms will accept
- Cognitive behavioural therapy is feasible and effective in general medical outpatients with unexplained symptoms
- Basic principles of cognitive behavioural therapy, such as the recognition of the patients' attributions of their symptoms and effective reassurance, could help a large proportion of patients with unexplained symptoms
- Differentiation between patients whose symptoms will probably resolve in due course and those who need more specialised treatment is important

treatment rationale might also have had some therapeutic effect. In addition, several patients in the control group sought psychiatric or psychological help elsewhere. The fairly high recovery rate in the controls limited the extent to which any additional benefits of the psychological intervention could be shown.

The dilution of treatment effect because of the variability of response of patients to treatment, the use of an intention to treat method of analysis, and the recovery rate in the controls means that the results provide impressive support for the efficacy of cognitive behavioural therapy in patients with unexplained physical symptoms. However, it also makes clear that the efficacy of treatment depends to a great extent on the selection of patients. Differentiation between patients whose symptoms will probably resolve in due course and those whose symptoms will persist without treatment is very important. Basic principles of cognitive behavioural therapy, such as the recognition of the patients' attributions of their symptoms and effective reassurance, could probably be incorporated in routine clinical practice. This might help a large proportion of patients presenting with unexplained physical symptoms. The application of more intensive psychological treatment should be limited to patients in whom there is a high chance of their symptoms persisting.

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Success of cardiopulmonary resuscitation after heart attack in hospital and outside hospital

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Abstract

***Objectives*—To determine factors associated with cardiopulmonary resuscitation being attempted after cardiac arrest from myocardial infarction, in or outside hospital, and estimate short term and long term survival rates.**

***Design*—Descriptive cross sectional and cohort study.**

***Setting*—Community based register of all suspected heart attacks and sudden cardiac deaths in Lower Hunter region of New South Wales, Australia.**

***Subjects*—4924 men and women aged 25–69.**

***Main outcome measures*—Rates of attempted cardiopulmonary resuscitation and survival after successful resuscitation.**

***Results*—Cardiopulmonary resuscitation was attempted in 41% of cases of cardiac arrest after myocardial infarction outside hospital and 63% of cases in hospital. Survival rates at 28 days were 12% and 39% respectively. Among the survivors, although 41% had another myocardial infarction (or coronary death), 81% of both groups were still alive two years later. Younger and better educated people were more likely to receive cardiopulmonary resuscitation in either setting, and being married predicted cardiopulmonary resuscitation being attempted outside hospital. Younger age predicted better survival rates after attempted resuscitation in hospital.**

***Conclusions*—The reasons for better education to predict cardiopulmonary resuscitation being attempted need explanation. The higher survival rate after cardiopulmonary resuscitation in hospital compared with outside hospital and the good long term prognosis for survivors in both settings suggest that attempts to improve success of cardiopulmonary resuscitation outside hospital may be worth while.**

Introduction

A large variation in survival rates has been reported for people who receive cardiopulmonary resuscitation after cardiac arrest outside hospital, with poorer prognosis among elderly patients and those who have not

regained a cardiac rhythm by the time they reach hospital.[1-3] In addition, there may be racial and other social factors which influence the chances of being resuscitated after cardiac arrest.[4,5] There have been few studies of cardiopulmonary resuscitation in hospitals or of long term survival after cardiopulmonary resuscitation.

We used a population based register of people who had had a heart attack to test the hypothesis that the chances of having cardiopulmonary resuscitation attempted after cardiac arrest, and the success rates, vary according to age, sex, and socioeconomic status. We also hypothesised that survival rates would be better for cardiac arrest in a hospital rather than outside hospital.

Methods

The Newcastle Collaborating Centre of the World Health Organisation's MONICA (monitoring trends and determinants in cardiovascular disease) project monitored all suspected cases of sudden death and acute myocardial infarction among residents of the Lower Hunter region of New South Wales, Australia, who were aged 25-69 years. Study nurses monitored all hospitals in the area, registering every patient likely to meet the study criteria (very few patients were treated at home). All death certificates for the population were also scrutinised.[6] These data were used to determine the diagnostic category according to the standardised criteria developed by the World Health Organisation.[7] This report includes coronary events in the MONICA categories "definite myocardial infarction," "possible myocardial infarction," and "ischaemic cardiac arrest."

For all registered events, information was obtained on whether a cardiac arrest occurred outside or after admission to hospital and whether resuscitation was attempted outside hospital, on arrival, or during hospitalisation. Records were reviewed 28 days after the start of the event to assess short term survival. To determine long term survival, all events for the same patient were linked; the analyses reported here refer to the initial cardiac arrest.

This study includes cases registered between 27 August 1984 and 31 December 1991. There was a gap between January 1986 and July 1988 when registration continued but data on cardiac arrest and medical care were not collected, and this period is therefore not included in this report.

All patients who were enrolled in the study and who were not known to have died were sent a postal questionnaire at their last known address. Those who did not reply were sent a second questionnaire and, if possible, contacted by telephone. All death records for the state of New South Wales and all registrations in the study up to March 1994 were searched to determine survival.

STATISTICAL METHODS

Crude estimates of odds ratios and χ^2 tests for differences and linear trends were used to compare patients according to whether resuscitation was attempted and whether they survived after resuscitation. Logistic regression models were used to estimate adjusted odds ratios and 95% confidence intervals.

Information on age and sex was available for all subjects. Marital status and level of education were not known for many of the sudden deaths (for which information on cardiopulmonary resuscitation was also often missing). An "unknown" category was therefore used for these variables where appropriate; for the logistic regression analyses, however, subjects with unknown marital status were omitted because of the small numbers. For the fatal cases where it was not known whether cardiopulmonary resuscitation had been attempted, it was assumed that cardiopulmonary resuscitation had not been attempted.

Estimates of survival were made (and curves drawn) with the Kaplan-Meier method, and differences between groups were tested with the log rank Wilcoxon χ^2 test. Patients who could not be contacted and were not known to have died were presumed to be alive at the end of the study, so any times of loss to follow up were unknown. (Survival estimates were not significantly different when the subjects with no follow up were omitted or when survival for 28 days after last known contact was assumed.)

TABLE I—*Attempted cardiopulmonary resuscitation in 1183 patients who had cardiac arrest outside hospital. Values are numbers (percentages) unless stated otherwise*

	Cardiac arrest	Resuscitation attempted	Odds ratio for resuscitation attempted: Crude	Odds ratio for resuscitation attempted: Adjusted (95% confidence interval)*
Total	1183	480 (41)		
Age (years):				
<50	134	59 (44)	1·00	1·00
50-59	325	149 (46)	1·08	0·94 (0·59 to 1·50)
60-69	724	272 (38)	0·76	0·72 (0·47 to 1·11)
			Trend: P=0·024	
Sex:				
Male	907	380 (42)	1·00	1·00
Female	276	100 (36)	0·79	0·90 (0·66 to 1·24)
			Difference: P=0·093	
Marital status:				
Married	774	379 (49)	1·00	1·00
Not married	349	89 (26)	0·36	0·39 (0·29 to 0·52)
Unknown	60	12 (20)	0·26†	
			Difference: P=0·001	
Educational level attained:				
Primary school	151	67 (44)	1·00	1·00
High school	535	281 (53)	1·39	1·32 (0·90 to 1·94)
Technical college	107	60 (56)	1·60	1·35 (0·79 to 2·29)
University or college	38	25 (66)	2·41	2·11 (0·96 to 4·63)
Unknown	352	47 (13)	0·19†	0·18 (0·11 to 0·29)
			Trend: P=0·009	

*Based on logistic regression for all subjects except the 60 with marital status unknown.
†Not included in calculation of significance.

Results

During this study, 4924 people with coronary events met the inclusion criteria and 3962 of them were managed in hospital. The remainder were not managed in an acute care hospital, almost all of them dying out of hospital. Sixty people had a cardiac arrest outside hospital, were successfully resuscitated, and within the next 28 days had a further cardiac arrest in hospital. Five of these survived 28 days and were still alive at the end of two years. These 60 patients were included in the analyses of cardiac events outside hospital rather than in hospital.

CARDIAC EVENTS OUTSIDE HOSPITAL

Tables I and II show the results for the 1183 patients who had a cardiac arrest outside hospital and the 480 in whom resuscitation was attempted. Of these 480 patients, 58 were alive 28 days later, 49 were known or presumed to be alive one year later, and 47 were known or presumed to be still alive two years after the event (fig 1). In 110 cases resuscitation was started outside hospital and continued on arrival at hospital. Nine of these people survived at least 28 days, and all nine were still alive two years later. These people were included in the analysis of events outside hospital only.

Table I shows that resuscitation was significantly less likely to be attempted in older people, people who were not married, and those with a lower level of education. Marital status remained significant even when the other variables were taken into consideration. When resuscitation was attempted, survival up to 28 days was significantly related only to level of education (table II).

CARDIAC EVENTS IN HOSPITAL

Tables III and IV show the results for the 491 patients who had a cardiac arrest in hospital and the 308 in whom resuscitation was attempted. Of these 308 patients, 120 were alive 28 days later, 104 were known or presumed to be alive one year later, and 97 were known or presumed to be still alive two years after the event (fig 2).

Table III shows that resuscitation was significantly more likely to be attempted in younger people and in those educated beyond primary school level. When resuscitation was attempted, there was a significant survival benefit associated with younger age (table IV).

FURTHER ANALYSES

Of the 178 resuscitated patients alive at 28 days after a cardiac arrest (58 occurring outside hospital and 120 in hospital), 73 had a subsequent coronary event during the next two years. Figure 3 shows the Kaplan-Meier plots for those who survived to 28 days after a cardiac arrest. There was no significant difference between the survival estimates of the two groups ($\chi^2=0{\cdot}246$, df=1, P=0·62).

The data for the periods 1984-5, 1988-9, and 1990-1 were examined separately. There were no systematic or significant differences over time in the proportions in whom resuscitation was attempted or the success rates.

Although the presence of ventricular fibrillation or tachycardia was not routinely recorded, it was noted among a subset of patients (from 1989 to 1991) who had a cardiac arrest in hospital. Of the 117 in whom defibrillation was attempted, 54 (47%) survived 28 days, compared with 12 (21%) of the 57 in whom defibrillation was not attempted.

TABLE II—*Success of attempted cardiopulmonary resuscitation in 480 patients who had cardiac arrest outside hospital. Values are numbers (percentages) unless stated otherwise*

	Resuscitation attempted	Survival*	Odds ratio for survival: Crude	Odds ratio for survival: Adjusted (95% confidence interval)†
Total	480	58 (12)		
Age (years):				
<50	59	8 (14)	1·00	1·00
50-59	149	16 (11)	0·77	0·64 (0·25 to 1·64)
60-69	272	34 (13)	0·91	0·88 (0·37 to 2·09)
			Trend: P=0·096	
Sex:				
Male	380	48 (13)	1·00	1·00
Female	100	10 (10)	0·77	0·89 (0·42 to 1·89)
			Difference: P=0·47	
Marital status:				
Married	379	46 (12)	1·00	1·00
Not married	89	11 (12)	1·02	1·11 (0·54 to 2·31)
Unknown	12	1 (8)	0·66‡	
			Difference: P=0·95	
Educational level attained:				
Primary school	67	9 (13)	1·00	1·00
High school	281	24 (9)	0·60	0·61 (0·26 to 1·39)
Technical college	60	10 (17)	1·29	1·26 (0·46 to 3·43)
University or college	25	8 (32)	3·03	3·07 (1·00 to 9·42)
Unknown	47	7 (17)	1·13‡	0·99 (0·32 to 3·02)
			Trend: P=0·013	

*Alive 28 days after resuscitation.
†Based on logistic regression for all subjects except the 12 with unknown marital status.
‡Not included in calculation of significance.

TABLE III—*Attempted cardiopulmonary resuscitation in 491 patients who had cardiac arrest in hospital. Values are numbers (percentages) unless stated otherwise*

	Cardiac arrest	Resuscitation attempted	Odds ratio for resuscitation attempted: Crude	Odds ratio for resuscitation attempted: Adjusted (95% confidence interval)*
Total	491	308 (63)		
Age (years):				
<50	39	30 (77)	1·00	1·00
50-59	97	66 (68)	0·64	0·55 (0·20 to 1·55)
60-69	355	212 (60)	0·44	0·37 (0·14 to 0·95)
			Trend: P=0·015	
Sex:				
Male	308	193 (63)	1·00	1·00
Female	183	115 (63)	1·01	1·26 (0·80 to 1·97)
			Difference: P=0·97	
Marital status:				
Married	324	211 (65)	1·00	1·00
Not married	150	92 (61)	0·85	1·02 (0·64 to 1·62)
Unknown	17	5 (29)	0·22†	
			Difference: P=0·42	
Educational level attained:				
Primary school	82	51 (62)	1·00	1·00
High school	208	166 (80)	2·40	2·35 (1·33 to 4·18)
Technical college	41	33 (80)	2·51	2·30 (0·92 to 5·74)
University or college	14	11 (79)	2·23	1·86 (0·47 to 7·43)
Unknown	146	47 (32)	0·29†	0·28 (0·16 to 0·50)
			Trend: P=0·016	

*Based on logistic regression for all subjects except the 17 with unknown marital status.
†Not included in calculation of significance.

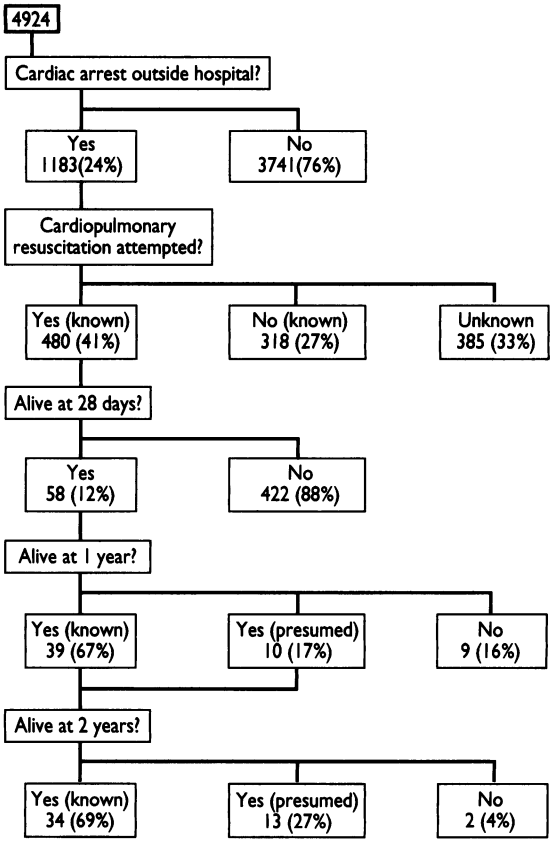

FIG 1—*Survival of patients who had cardiac arrest outside hospital*

Discussion

This study throws new light on the pattern of cardiac resuscitation since we report data for cardiac arrests occurring both in and outside hospital in a whole population. In the early 1990s all ambulances in the Lower Hunter region were equipped with automatic defibrillators. Until then, only special paramedic ambulances had had defibrillators. There had been spasmodic campaigns to raise public awareness over the years, but there was not a high level of awareness of the importance of cardiopulmonary resuscitation in the community.

SURVIVAL AFTER ATTEMPTED RESUSCITATION

Success rates of attempted resuscitation (survival to 28 days) were around three times higher for cardiac arrests in hospital than for arrests outside hospital, but the two year survival of those who survived to 28 days was the same (81%). These data suggest that people who are successfully resuscitated can expect to do quite well; although 41% had another myocardial infarction during the next two years, most survived the period.

Beuret *et al*[8] reported that, in a smaller study of 181 patients (including 43 with acute myocardial infarction), 23 survived to leave hospital and 15 (65%)

TABLE IV—*Success of attempted cardiopulmonary resuscitation in 308 patients who had cardiac arrest in hospital. Values are numbers (percentages) unless stated otherwise*

	Resuscitation attempted	Survival*	Odds ratio for survival	
			Crude	Adjusted (95% confidence interval)†
Total	308	120 (39)		
Age (years):				
<50	30	16 (53)	1·00	1·00
50-59	66	34 (52)	0·93	0·99 (0·40 to 2·48)
60-69	212	70 (33)	0·43	0·44 (0·19 to 1·00)
			Trend: P=0·003	
Sex:				
Male	193	75 (39)	1·00	1·00
Female	115	45 (39)	1·01	1·41 (0·83 to 2·40)
			Difference: P=0·96	
Marital status:				
Married	211	90 (43)	1·00	1·00
Not married	92	30 (33)	0·65	0·63 (0·36 to 1·09)
Unknown	5	0	0·00‡	
			Difference: P=0·10	
Educational level attained:				
Primary school	51	24 (47)	1·00	1·00
High school	166	64 (39)	0·71	0·59 (0·31 to 1·15)
Technical college	33	15 (45)	0·94	0·77 (0·31 to 1·96)
University or college	11	8 (73)	3·00	2·20 (0·49 to 9·82)
Unknown	47	9 (19)	0·27‡	0·24 (0·09 to 0·62)
			Trend: P=0·34	

*Alive at 28 days after resuscitation.
†Based on logistic regression for all subjects except the 5 with unknown marital status.
‡Not included in calculation of significance.

of these were alive after one year. Short term success rates, to the time of leaving hospital, have been reported to vary from 2% to 33% of people who had a cardiac arrest outside hospital,[1 9] but the differences are at least partly due to differences in definition.[9] People whose cardiac arrests are due to ventricular fibrillation or tachycardia tend to have a better prognosis than those with asystole.[5 9 10] Our limited data of a 47% 28 day survival rate among those defibrillated in hospital are consistent with this.

A meta-analysis of cardiac arrests in hospital found that 24% of patients with a primary diagnosis of acute myocardial infarction survived to leave hospital (compared with 15% of patients with other diagnoses).[11]

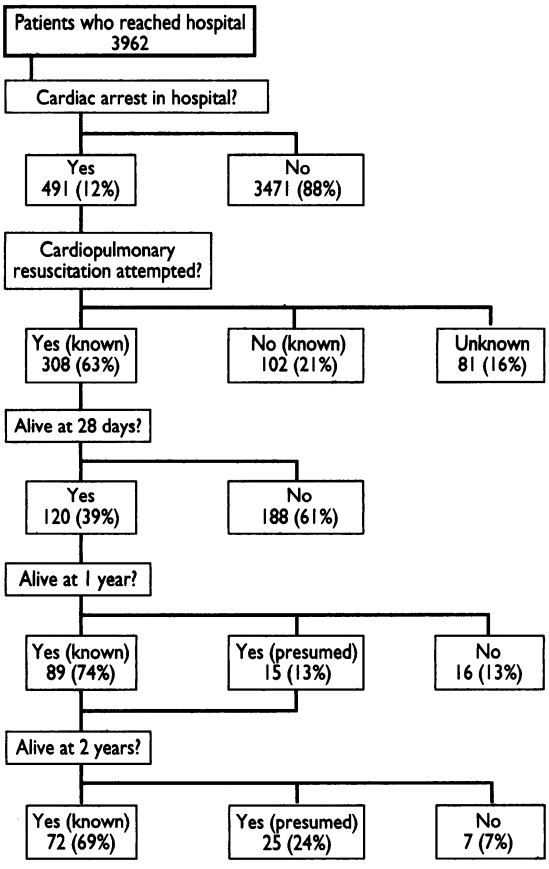

FIG 2—*Survival of patients who had cardiac arrest in hospital*

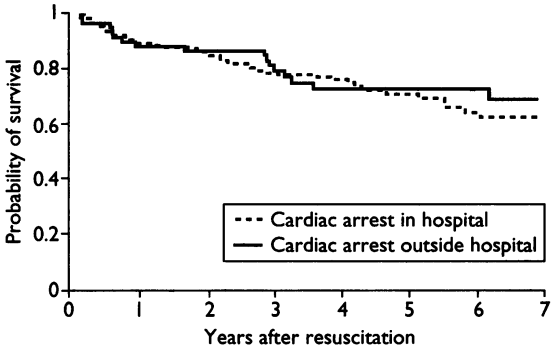

FIG 3—*Survival after cardiopulmonary resuscitation in hospital and outside hospital*

Our survival rates after cardiac arrest in hospital were consistently better than this. Most other studies of cardiopulmonary resuscitation do not distinguish those resuscitations associated with myocardial infarction. However, the BRESUS study of cardiopulmonary resuscitations in British hospitals did separate those after cardiac arrest from others.[12] Of the patients aged under 65 in whom cardiopulmonary resuscitation was attempted, 22% of those in general wards and 39% in specialised hospital areas were discharged alive from hospital and, of these, 69% and 78% respectively were still alive after one year.

FACTORS ASSOCIATED WITH ATTEMPTED RESUSCITATION

The association with marital status in attempted resuscitation presumably reflected the presence of a spouse to notice the cardiac arrest and call for help—there was no difference in attempted resuscitation according to marital status for arrests occurring in hospital. The slightly lower rate of attempted resuscitation for people aged over 60 might also reflect the absence of a witness. Others have found the presence of a witness to be an important predictor of survival after cardiac arrest.[4 5 10]

The reason for educational attainment—our measure of socioeconomic status—predicting the chance of having resuscitation attempted is not readily apparent, and it should be noted that educational attainment was unknown in 30% of patients in whom resuscitation was attempted. One other study has found a relation with socioeconomic status and survival from cardiac arrest due to ventricular fibrillation or tachycardia; "higher" social status was associated with better survival.[5] Another study reported that racial factors were associated with survival after cardiac arrest

Key messages

- This study showed that cardiopulmonary resuscitation was attempted in 41% of cases of cardiac arrest outside hospital and in 63% of cases in hospital
- In both settings resuscitation was more likely to be attempted in younger people and in those with a higher level of education
- Survival rates at 28 days after the event were 12% and 39% for cases outside hospital and in hospital respectively; younger age in hospital was the only factor to predict survival
- Most (81%) of those who survived to 28 days were still alive two years later
- There is a need to understand why socioeconomic status seems to be associated with receiving resuscitation and to try to improve success of resuscitation outside hospital

outside hospital; part of the reason was that black people were less likely to have cardiopulmonary resuscitation started by a bystander than were white people.[4] It may be worth examining the way the public responds to cardiac arrest in different groups.

CONCLUSION

The most impressive predictor of survival was if the cardiopulmonary resuscitation was performed in hospital rather than outside. This may be related to several factors that have been found to predict survival—such as time to starting resuscitation[5 9] and the skill and resources available to the resuscitation team. Since long term survival seems to be similar after initial resuscitation, whether this occurs in or outside hospital (81% over two years), any improvement in the success of cardiopulmonary resuscitation outside hospital would be beneficial.

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Conflict of interest: None.

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Epidural anaesthesia and low back pain after delivery: a prospective cohort study

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Abstract

***Objective*—To determine whether epidural anaesthesia during labour and delivery is a risk factor for postpartum back pain.**

***Design*—Prospective cohort study with follow up at one day, seven days, and six weeks after delivery.**

***Setting*—Teaching hospital in Montreal.**

***Subjects*—329 women who delivered a live infant(s) during the study period. Exclusion criteria were back pain before pregnancy and delivery by elective caesarean section.**

***Intervention*—Epidural anaesthesia during labour and delivery.**

***Main outcome measures and results*—The primary outcome variable was development of postpartum low back pain. Back pain was quantified with self reports (yes/no), a pain score (numeric rating scale), and degree of interference with daily activities. Of the 329 women, 164 received epidural anaesthesia during labour and 165 did not. The incidence of low back pain in epidural *v* non-epidural group was 53% *v* 43% on day one; 21% *v* 23% on day seven; and 14% *v* 7% at six weeks. The relative risk for low back pain (epidural *v* non-epidural) adjusted for parity, delivery, ethnicity, and weight was 1·76 (95% confidence interval 1·06 to 2·92) on day one; 1·00 (0·54 to 1·86) on day seven; and 2·22 (0·89 to 5·53) at six weeks. There were no differences between the two groups in pain scores or the frequency of interference with daily activities. Similar results were obtained in the subgroup of women with low back pain of new onset—that is, those women with no back pain during their pregnancy.**

***Conclusions*—Postpartum low back pain was common but decreased considerably over the short term. The association between epidural anaesthesia and postpartum low back pain was inconsistent over time with a significantly increased risk of low back pain (epidural *v* non-epidural) noted only on the first day after delivery.**

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Introduction

Over the past 35 years epidural anaesthesia has been used to provide effective pain relief for women during labour and delivery. Two retrospective surveys in the United Kingdom have suggested an association between epidural anaesthesia and long term low back pain of new onset after delivery.[1 2] In both studies women receiving epidural anaesthesia during labour and delivery were almost twice as likely to develop back pain after delivery as women not given epidural anaesthesia. Both surveys, however, were compromised by their retrospective design and low response rate. The objective of our prospective cohort study was to determine whether epidural anaesthesia during labour and delivery was a determinant of postpartum low back pain.

Methods

All women attending the (tertiary level) labour and delivery unit of the Royal Victoria Hospital in Montreal for delivery of a live infant(s) were eligible for study. Women who before pregnancy had a history of back pain requiring medical attention were excluded as there is evidence that such pain may be an independent risk factor for postpartum back pain.[3] Also excluded were women undergoing elective caesarean section as spinal anaesthesia rather than epidural anaesthesia was the standard for this procedure.

A prospective cohort study design was used, with the exposure of interest being epidural anaesthesia during labour and delivery (yes/no). Epidural anaesthesia was performed on request, with six obstetric anaesthetists participating in the study. The anaes-