Effect of the critical care outreach team on patient survival to discharge from hospital and readmission to critical care: non-randomised population based study

Ball C, Kirby M & Williams S. Effect of the critical care team on patient survival to discharge from hospital and readmission to critical care: non-randomised population based study. British Medical Journal 2003; 327:1014-1017.

OBJECTIVES OF THE STUDY

The aim of this study was to determine the effectiveness of a critical care follow-up service, termed critical care outreach, on patient survival to hospital discharge and critical care readmission.

SETTING AND SAMPLE

This study was conducted at the Royal Free Hampstead NHS trust in London, a 1,200 bed hospital with 13 active critical care beds. Patients admitted to the site during the study period were included in the study if it was their first or only admission during the study period. Patients were excluded if they died in the critical care unit, if their critical care stay spanned both the control and intervention period, or if they were in the critical care unit in the control period, discharged and then were readmitted in the intervention period.

METHOD

1bis before and after intervention study used historical controls, with each block of control and intervention lasting one year. The critical care outreach service, the intervention, consisted of a team of five senior critical care nurses, who provided coverage 12 hours per day, 7 days per week. Outreach team members assessed patients who had been discharged from critical care at least daily. Outreach team members or ward staff provided needed interventions depending on the skill required. Patients were discharged from the outreach service if they were making satisfactory progress, as demonstrated by a number of criteria (early warning triggers for patient at risk teams); however, ward staff were able to re-refer patients if they showed signs of deterioration. Demographic, clinical and outcome data were accessed from a routinely collected dataset that was entered into a database, which was assessed for reliability of data entry.

RESULTS

A total of 470 patients (201 controls and 269 intervention) were included in the study. Demographic and clinical characteristics of the two groups were similar in terms of age, gender, diagnosis, length of stay, severity of illness and co-morbidities. After the introduction of the outreach service, there was significant improvement in survival to hospital discharge and significant decrease in the number of critical care readmission. The kinds of interventions performed by the critical care outreach team included guiding tracheostomy and continuous positive airway pressure management, optimising patient positioning, requesting prescriptions and blood tests etc.

CRITIQUE

While many descriptive studies about the UK model for critical care outreach have been published recently¹, this publication documents a rigorous implementation and evaluation plan for determining the effect of a critical care outreach team in one hospital. The authors are highly regarded clinical experts with postgraduate preparation; the first author, who has doctoral qualifications, has previously published on the UK outreach services^{2,3}.

In their literature review, the authors provide a brief historical overview of outreach service in the UK and identify its similarities and differences to the Australian medical emergency teams⁴. 5 that are emerging. They note that rigorous evaluation data has not yet substantiated the effect of outreach teams, thus highlighting the significance of their research.

The before and after design is limited because the research cannot rule out several other causes for improvements in outcome. For example, other hospital initiative, better staff training and new drugs and treatment may have actually been responsible for improved outcomes. However, the authors note that, to their knowledge, no new innovations could have accounted for their results. They also provide their reasons for choosing this design. It is important to understand that the critical care outreach services were mandated in England and Wales, and were implemented rather suddenly, thus the options for designing a more rigorous prospective study was not feasible. The authors do not comment on the ethical considerations of the study; however, when new health services are introduced and routinely collected, de-identified data is used and individual patient consent is generally not required.

The authors described their sample and selection criteria in detail, and provide sound rationale for excluding some patients. The authors do not give any details about the numbers of patients who were excluded from the study, which means that the demographic and clinical information provided

does not necessarily portray the 'typical' patients that were cared for in the unit. Thus, consideration of how the study population compares to the Australian population is somewhat difficult. The description of the outreach service appears to contain components of the liaison nurse service^{6,7} and the medical emergency team service^{4,5} currently delivered in Australia. While the researchers do not identify how many nurses were available at any one time, the reader should note that the whole service had a caseload of approximately 270 patients in the year.

The authors should be commended for providing evidence that their data was reliable, despite using retrospective and routinely collected data. The finding that hospital survival was increased with the outreach service, while statistically significant, must also be examined for clinical significance or relevance. The authors report that the risk ratio (the term used when relative risk is calculated and the denominator is frequency of events) of survival was 1.08 (95% CI 1.00 to 1.18), meaning that those in the intervention group had about 1.1 times the 'risk' of the control group to surviving to hospital discharge. This improvement suggests that, while the outreach service can improve hospital survival, its effect is not particularly large. The risk ratio of critical care readmission is larger, 0.48 (95% CI 0.26 to 0.87), suggesting that patients in the intervention group had about half the 'risk' as those in the control group to be readmitted to critical care, a clinically important finding.

In their discussion, the authors take particular care in identifying the strengths and weaknesses of their research. They identify the limitations of the before and after design, the inability to tightly control an intervention when it involves human services provided by a number of different individuals, and issues related to sample size and routinely collected data. They discuss their research in relation to another recently published UK study and identify alternate explanations for their findings.

While the UK outreach services do not have direct counterparts in the Australian context, the kinds of services they provide do relate to the nurse led ICU liaison service, which is gaining popularity in Australia. The manner in which the UK outreach service was implemented, including hours of operation, services delivered and records kept, may be used as a guide and adapted for use by liaison nurses in Australia. This article was succinct, easy to read and made good use of tables and boxes. The discussion provides an exemplar for others who may have to justify outcomes based on a study design that is not a randomised controlled trial. This article is a must read for those critical care nurses interested in innovative new nursing roles that have the potential to improve patient care and outcomes.

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