ORIGINAL ARTICLE

Use of the patient at risk scores in the emergency department: a preliminary study

J E Rees, C Mann

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See end of article for authors' affiliations

Correspondence to:
Miss J E Rees, Department
of Anaesthetics, Royal
Devon and Exeter
Hospital, Wonford Site,
Bovemoor's Lane, Exeter,
Devon EX2 5DF, UK;
jakrees@doctors.org.uk

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Objectives: To assess the feasibility of using a modified patient at risk (PAR) scoring system in the emergency department.

Methods: Modified PAR scores were calculated for 30 triage category 1 and 2 patients on arrival in the department and at 15 minutes after the initial resuscitation was underway using observation datasheets designed for this project.

Results: Three patients (10%) were admitted to the intensive care unit (ICU). Twenty six patients (88%) were admitted to a general ward and one was discharged. Fifty per cent of the patients had a PAR score of 3 or more on arrival. Eighty seven per cent of the general ward patients had a PAR score that was stable or improved during the first 15 minutes of resuscitation. The other three ward patients, whose scores deteriorated, were assessed in the emergency department by the appropriate teams and deemed appropriate for ward beds. Two of the three ICU patients deteriorated in the resuscitation room. The third ICU patient maintained a PAR score of 2 but had such overwhelming injuries that ICU was the only option.

Discussion: Serial PAR scores are far more informative than isolated scores. This study suggests that serial PAR scores could be used in three ways in the emergency department. Firstly, in the assessment of individual patients and their response to initial resuscitation. Secondly, as a guide to the need further specialist assessment before leaving the emergency department. Finally, as an audit tool to measure the effectiveness of initial treatments in large numbers of patients during the initial resuscitation.

Patient at risk (PAR) scores are now commonly used for the assessment of hospital inpatients. The scores are used to assess patients that nursing staff are concerned about and give a reproducible measure of how "at risk" the patient is. This permits early identification of deteriorating patients. A score of 3 or more should result in a direct intensive care unit (ICU) referral. This should result in a rapid assessment of the patient on the ward by the ICU team concluding in modification of patient management to prevent further deterioration. This has been shown to be effective in reducing mortality and morbidity of "at risk" ward patients as well as preventing ICU admissions.^{1–6}

To calculate a standard PAR score CNS response, pulse rate, systolic blood pressure, respiratory rate, and urine output is required. In the emergency department (ED) urine output is infrequently measured so this was excluded from the scoring system used in this study.^{7,8} Our modified PAR scoring system is given in the table 1.

We set out to assess the feasibility of using a modified PAR scoring system in the emergency department to monitor the initial response to resuscitation of all triage category 1 and 2 patients and to assess the appropriateness of their onward referral.

METHODS

Modified PAR scores were calculated for all triage category 1 and 2 patients on arrival in the department and at 15 minutes after the initial resuscitation was underway.

An initial retrospective audit was carried out to assess the availability of the data necessary to calculate a modified PAR score for all triage category 1 and 2 patients from the emergency department cards. This showed that only 19% of 103 emergency department cards contained enough information to calculate a modified PAR score on arrival. None of the cards contained enough information to calculate a score at 15 minutes. Respiratory rate was the least recorded parameter.

To overcome these problems a new observation sheet for the collection of patient data while in the resuscitation room was developed. This included all the data required to calculate a PAR score at time = 0 and 15 minutes.

The new PAR observation sheet was used for all patients in the resuscitation room.

Abbreviations: ICU, intensive care unit; PAR, patient at risk

Table 1 Modified PAR scoring system used in this study

Score	3	2	1	0	1	2	3	Score
CNS response				Alert	Drowsy	Pain		
Respiratory/min		<8		9–14	15–20	21–30	>30	
Pulse rate		<40	40–50	51–100	100–110	111–130	>130	
Systolic blood pressure	<70	71–80	81–100	101–199		>200

Figure 1 Graph to show the change in PAR score for individual patients during the first 15 minutes of resuscitation.

RESULTS

Thirty patients were studied, of these 50% had a PAR score of 3 or more on arrival in the emergency department. Three patients (10%) were admitted to the ICU. Twenty six patients (88%) were admitted to a general ward and one was discharged.

Of the 26 patients who were admitted to a general ward 40% had a modified PAR score that was unchanged in the first 15 minutes of resuscitation and 47% had a PAR score that was improved during the initial 15 minutes in the resuscitation room (fig 1).

Three of the patients admitted to a general ward had modified PAR scores that increased in the first 15 minutes. The first was an asthmatic patient whose blood gas pressures were improving. The second patient had an infective exacerbation of chronic obstructive pulmonary disease, he was assessed by the medics in the resuscitation room and sent to a monitored ward bed. The third was a 95 year old woman who had had a massive cerebrovascular event with congestive cardiac failure and renal failure.

Two of the three ICU patients clinically deteriorated in the resuscitation room. The modified PAR score of the first increased from 2 to 6. The PAR score for the second patient decreased from 4 to 2 as a result of intubation. The third ICU patient maintained a PAR score of 2 but had such overwhelming injuries (fracture C1, haemothorax, and bilateral flail chest) that management outside of ICU would have been inappropriate.

DISCUSSION

We set out to assess the feasibility of using a modified PAR scoring system in the emergency department to monitor the initial response to resuscitation of all triage category 1 and 2 patients and to assess the appropriateness of their onward referral.

We set the following standards. A rising modified PAR score should be taken as an indication that the patient needed further assessment in the emergency department and consideration for ICU. A PAR of 3 or above, depending on the trend of response to initial resuscitation, should warrant the same course of action.

The modified PAR scores obtained show that 87% of patients were stabilised within the first 15 minutes of resuscitation.

Emergency department staff and either the on call physicians or intensivists jointly assessed all patients whose modified PAR scores increased while in the emergency department before a decision about a transfer destination.

The results suggest that serial PAR scores, much like Glasgow coma score in head injury, are far more informative than isolated scores. The difference between readings can be used to identify at risk patients who are deteriorating.

Furthermore, the study suggests that serial PAR scores could be used in three ways in the emergency department. Firstly, in the assessment of individual patients as a guide to their response to initial resuscitation. Secondly, as a guide to which individual patients need further specialist assessment before leaving the emergency department. Finally, as an audit tool to measure the effectiveness of initial treatments in large numbers of seriously ill and injured patients during the first 15 minutes in the resuscitation room.

CONTRIBUTORS

Jacqui Rees carried out the research, and wrote the paper. Cliff Mann initiated the study idea and reviewed the final report. Jacqui Rees acts as guarantor for the paper.

Authors' affiliations

J E Rees, Department of Anaesthetics, Royal Devon and Exeter Hospital, Exeter, UK

C Mann, Emergency Department, Taunton and Somerset Hospital, Musgrove Park, Taunton, UK

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