

Presence of a pre-hospital critical care team is associated with improved mortality amongst trauma patients: a national trauma registry data study

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Background:

Traumatic injuries result in considerable morbidity and mortality. Early access to critical care procedures improves outcomes for trauma patients. Previous work has shown improved outcomes for trauma patients when attended to by a Prehospital Critical Care Team (PHCCT). We wished to look at trauma outcomes across a national network with three PHCCTs.



Patients and Data Collection:

Secondary analysis of data from a routinely collected national trauma registry, covering the period from 2011 to 2016. All patients meeting trauma registry inclusion criteria were included in the study. Data was collected on demographic variables.

Methods:

A generalised additive model was constructed to adjust for potential confounding variables. The primary outcome was true 30 day mortality.

Results:

There were a total of 17,157 incidents (between January 2011 and December 2016) that were eligible for analysis. Of these 17,157 incidents, 776 (4.5%) involved a PHCCT and 13,504 (78.7%) involved other healthcare personnel, usually a paramedic team or non-PHCCT physician. Information was unavailable for the remaining 2,877 (16.8%) patients. These 2,877 incidents were not included in the analysis, leaving a total of 14,280 incidents with complete data.

Variable	Category	N = 14,280	%
Gender	Male	8,206	57.5
	Female	6,074	42.5
Patient taken to Major Trauma Centre	Yes	5,016	35.1
	No	9,264	64.9
Mode of transport to hospital	Land Ambulance	13,857	97.0
	Air Ambulance	423	3.0
Severe head injury	Yes	2,548	17.8
	No	11,732	82.2
Pre-hospital intubation	Yes	321	2.2
	No	13,959	97.8
Major trauma (ISS > 15)	Yes	3,076	21.5
	No	11,204	78.5

Table above: summary of demographics of all patients

Key result:

Once confounding variables had been accounted for by multivariate analysis , mortality rate was lower for the PHCCT group compared to the non-PHCCT group. When a trauma patient is treated by a prehospital critical care team, the odds ratio for 30 day mortality is 0.56 (95% CI 0.36 to 0.86, p=0.01).

Conclusion & perspectives :

This is the first comprehensive national data linkage study undertaken in the United Kingdom to attempt to address the identified gaps in evidence on the effect of PHCCT on patient outcomes. Our results suggest a mortality benefit when trauma patients in Scotland receive physician delivered prehospital critical care.

Our work joins a number of similar studies, from a number of countries, in suggesting benefit of a PHCCT above and beyond usual ambulance care. Like other studies, our work is retrospective, but it seems unlikely there will be an appetite (or equipoise) for randomised prospective studies in this area.

We believe our work supports the expansion of PHCCT resources as part of the evolving Scottish Trauma Network.

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