CRITICAL CARE

LETTER

Early survival and duration of hospital admission in rhabdomyolysis: ICNARC Case Mix Programme Database

Colin A Hutchison[1]*, Krishna Patel[2] and Tony Whitehouse[3]

New therapeutic measures are available for the management of rhabdomyolysis. To enable the design of future studies that will assess the clinical benefit of these interventions, we sought to first determine the current clinical outcomes of patients with rhabdomyolysis admitted to ICUs within England, Wales and Northern Ireland. We describe the duration of intensive care and hospital admissions associated with rhabdomyolysis, and the early survival measures for this population.

Acute kidney injury secondary to high serum myoglobin levels is a frequent cause of morbidity and mortality for patients with rhabdomyolysis [1]. Theoretically the severity and duration of the tubulointerstitial lesion that results could be reduced if rapid removal of myoglobin from the circulation was undertaken to reduce the tubules' exposure to myoglobin [2]. Recent case reports have highlighted that dialysis membranes with high molecular weight cut-off points (50 kDa) are able to provide significantly higher clearance rates of myoglobin compared with standard high-flux dialysis membranes [3,4].

To determine the clinical benefit of providing rapid removal of myoglobin in patients with rhabdomyolysis, randomised controlled trials are now required to determine whether the procedure improves outcomes compared with standard care. Possible clinical outcomes for these studies would be the duration of hospital stay, rates of renal recovery and survival. To allow the design of these studies, current clinical outcomes for this population are required. We therefore interrogated a national database to determine the clinical outcomes for patients with rhabdomyolysis admitted to ICUs.

The Case Mix Programme is the national clinical audit of adult, general critical care units in England, Wales and

Northern Ireland coordinated by the Intensive Care National Audit & Research Centre. Data were extracted for 439,834 admissions to 210 ICUs from the Case Mix Programme Database, covering the period from January 2006 to December 2010. Admissions with rhabdomyolysis were identified from the reported primary (mandated), secondary (optional) and ultimate (optional) reasons for admission to the critical care unit and other conditions in past medical history, all coded using the Intensive Care National Audit & Research Centre Coding Method [5]. Survival data were extracted at discharge from the Case Mix Programme unit and hospital. Length of stay in the ICU was calculated in fractions of days from the dates and times of admission to and of discharge from the Case Mix Programme unit. Length of stay in hospital was calculated in days from the dates of original admission to and ultimate discharge from an acute hospital.

Table 1. Data for admissions with rhabdomyolysis to adult general ICUs in England, Wales and Northern Ireland

Number of admissions	733
Age (years)	
Mean (standard deviation)	54.5 (19.6) (*n* = 733)
Median (IQR)	56 (38, 71) (*n* = 733)
Gender, number of males (%)	552 (75.3) (*n* = 733)
Critical care unit mortality, deaths (%)	157 (21.4) (*n* = 733)
Acute hospital mortality,[a] deaths (%)	221 (31.1) (*n* = 710)
Unit length of stay (days), median (IQR)	
Unit survivors	4.6 (2.1, 8.9) (*n* = 576)
Unit nonsurvivors	2.0 (1.0, 7.4) (*n* = 157)
All	4.0 (1.8, 8.8) (*n* = 733)
Total acute hospital length of stay (days),[a] median (IQR)	
Unit survivors	26 (14, 49) (*n* = 489)
Unit nonsurvivors	6 (2, 15) (*n* = 221)
All	20 (8, 40) (*n* = 710)

IQR, interquartile range. [a]Excluding readmissions to the critical care unit during the hospital stay.

*Correspondence: c.a.hutchison@bham.ac.uk
[1]Department of Nephrology, University Hospital Birmingham, Birmingham B15 2WB, UK
Full list of author information is available at the end of the article

Demographic and outcome data were available for 733 admissions to ICUs with rhabdomyolysis (Table 1). The ICU and hospital mortality rates for those admissions with rhabdomyolysis are high (21% and 31%, respectively). Additionally the median duration of hospital admission was substantial at 26 days (Table 1). Interventional studies are now required to determine whether providing a rapid removal of myoglobin to reduce the duration and severity of acute kidney injury in rhabdomyolysis will translate into improving these outcomes.

Competing interests

The authors declare that they have no competing interests.

Author details

[1]Department of Nephrology, University Hospital Birmingham, Birmingham B15 2WB, UK. [2]Intensive Care National Audit & Research Centre (ICNARC), Tavistock House, Tavistock Square, London WC1H 9HR, UK. [3]Department of Critical Care, University Hospital Birmingham, Birmingham B15 2WB, UK.

References

1. Bosch X, Poch E, Grau JM: **Rhabdomyolysis and acute kidney injury.** *N Engl J Med* 2009, **361**:62-72.
2. Gondouin B, Hutchison CA: **High cut-off dialysis membranes: current uses and future potential.** *Adv Chronic Kidney Dis* 2011, **18**:180-187.
3. Basnayake K, Cockwell P, Hutchison CA: **Rhabdomyolysis and acute kidney injury.** *N Engl J Med* 2009, **361**:1411-1413.
4. Heyne N, Guthoff M, Weisel KC: **Rhabdomyolysis and acute kidney injury [letter].** *N Engl J Med* 2009, **361**:1412.
5. Young JD, Goldfrad C, Rowan K: **Development and testing of a hierarchical method to code the reason for admission to intensive care units: the ICNARC Coding Method. Intensive Care National Audit & Research Centre.** *Br J Anaesth* 2001, **87**:543-548.