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Archives of Emergency Medicine and Critical Care

Research Article

Concussion Management in the Paediatric Emergency Department

Charles G Stewart[1]*, Nour Houbby[2], and Jaya Chawla[2]

[1]Chelsea and Westminster Hospital NHS Foundation Trust, UK
[2]Imperial College Healthcare NHS Trust, UK

*Corresponding author
Charles G Stewart, Chelsea and Westminster Hospital NHS Foundation Trust369 Fulham Road, London SW10 9NH, UK, Tel: 02033158600; Fax: 02033158121

Submitted: 09 January 2025
Accepted: 23 January 2025
Published: 26 January 2025

ISSN: 2476-2016

Keywords
• Concussion; Paediatric emergency; Medical training; Patient support

Abstract

Objectives: The aim of this study was to evaluate the quality of advice given to patients and their carers in the PED with a diagnosis of concussion and the extent that correct practices were utilised. A secondary aim was to characterise concussion symptoms and duration in our study population.

Methods: Data were extracted from our hospital Electronic Patient Record (EPR) between 1/6/22 and 1/6/23 for patients 0-15 years with a discharge diagnosis of concussion.

Patients/carers were telephoned and invited to answer a questionnaire pertaining to discharge advice, management of concussion at home, symptom type and duration. A maximum of three attempts at making contact via telephone were made.

Results: 49 patients were identified with concussion. Sports were implicated in 25 (51%) with school the second most common medium (n=10, 20%). The most common symptoms were headache, nausea and dizziness which made up 72(64%).

When discharged 30 (61%) were given patient information leaflets and a further 5 (10%) were given verbal advice on rest and a graduated return to play. 14 (29%) were given incomplete or incorrect advice29 patients were contacted by telephone. The mean duration of symptoms was 27 days with a median of 14. 12 (41%) had symptoms for 7 days or less. 13/29 (48%) telephone respondents stated misleading or incorrect advice

Conclusion: While it is encouraging that concussion literature was given to the majority of patients on discharge, the recognition, discharge advice and patient support post discharge needs to be improved.

INTRODUCTION

Concussion is a complex injury for physician, patients and their carers to understand, interchangeably referred to as minor traumatic brain injury (mTBI) [1,2]. It is defined as 'a traumatically induced transient disturbance of brain function' however several other definitions exist as clinicians struggle to agree on how best to describe the condition [3-6]. The diagnosis of concussion, once moderate or severe brain injury has been ruled out, is challenging and relies on observed features, such as loss of consciousness, patient declared symptoms and examination findings all of which are entered into one of several algorithms to confirm or refute the diagnosis. There is no single blood test or radiological scan to make the diagnosis and uncertainty results in up to 50% of concussions going undiagnosed [7-9].

Head injuries pose a significant challenge to the paediatric population with subsequent concussions an unwanted complication [9]. It is thought that up to a third of children will sustain a head injury by the age of 13 [10], with an estimated 35,000 children presenting to hospitals in England annually, giving and estimated head injury incidence of 400/100,000 [11]. Consequently, concussion represents a large proportion of paediatric emergency department (PED) presentations with sports related events the leading cause [12].

The management of concussion is poorly understood by physicians, generally, and advice given to patients and their carers is often inconsistent and not aligned to current recommendations [13]. Return to play protocols require a period of rest, both physical and cognitive, with a graduated return to play based on reported symptoms. There are several concussion protocols originating from medical and sporting sources and the UK government has published a unifying document in 2023 [14].

The aim of this study was to evaluate the quality of advice given to patients and their carers in the PED with a diagnosis of concussion and the extent that

correct practices were utilised. A secondary aim was to characterise concussion symptoms and duration in our study population

METHODS

Patients were identified from our hospital Electronic Patient Record (EPR) between 1/6/22 and 1/6/23 with a discharge diagnosis of concussion aged 0-15 years. Data were extracted for demographics, sex, race, mode of injury, place of injury, investigations and discharge advice.

Patients/carers were then telephoned and invited to answer a questionnaire pertaining to discharge advice, management of concussion at home, symptom type and duration. A maximum of three attempts at making contact via telephone were made. There were three different callers in this study to limit bias

Basic statistical methods were used to analyse data.

RESULTS

At total of 49 patients were diagnosed with concussion during the study period with 33 (67%) male and 16 (33%). Sports of all disciplines were implicated in 25 (51%) of concussions, however, school was the single most common medium for concussion (n=10, 20%) usually sustained during non-organised play either in the classroom or school yard (Figure 1).

The majority of patients (n=29, 59%) presented 2 or more days after the initial head injury. The most common symptoms were headache, nausea and dizziness which made up 72(64%) of presenting features with many patients stating more than one (Figure 2).

When discharged 30 (61%) were given patient information leaflets on concussion and a further 5 (10%) were given verbal advice on rest and a graduated return to play. 14 (29%) were given incomplete or incorrect advice (Figure 3).

29 patients were successfully contacted by telephone. The mean duration of symptoms was 27 days with a median of 14. 12 (41%) of patients had symptoms for 7 days or less (Figure 4).

When asked to recall, 13/29 (48%) of respondents stated misleading or incorrect advice (Table 1).

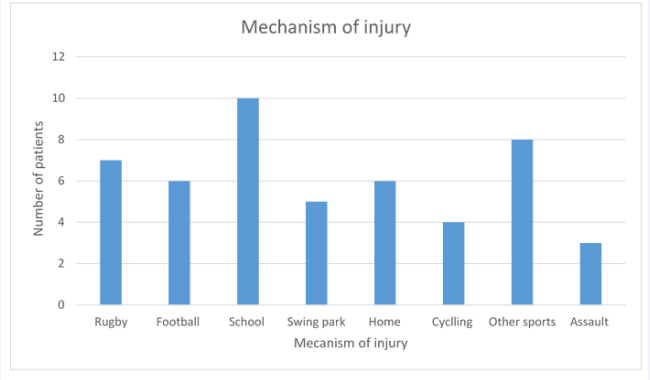

Figure 1 Mechanism of Injury.

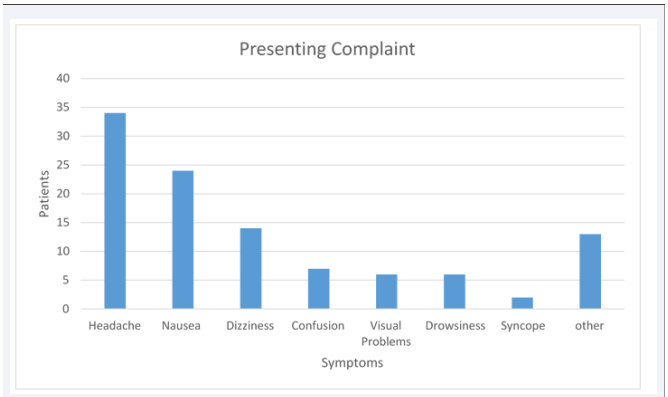

Figure 2 Symptoms.

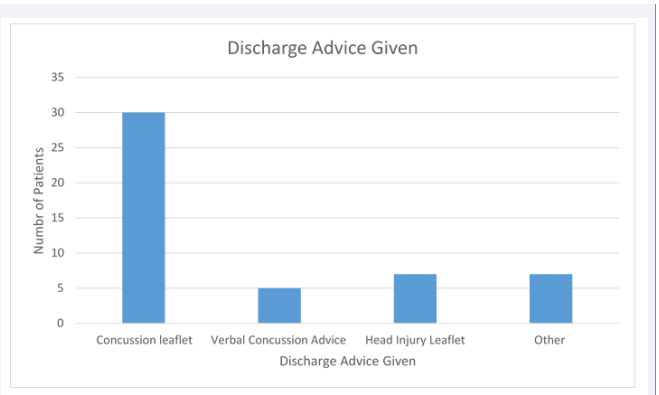

Figure 3 Advice given to Patients.

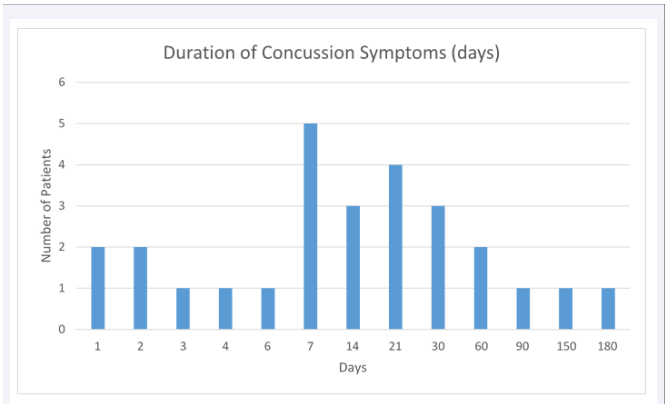

Figure 4 Duration of Concussion symptoms.

Table 1: Discharge advice given to patients contradictory to standard concussion protocol

Patients	Patients' Account of Advice Given on Concussion
1	Was given head injury leaflet, advised to stay off sports but was not given time frame for how long, told to limit screen time
2	No sport and check for symptoms of concussion, with vomit and vision loss.
3	Told to monitor daughter and was told it was a mild concussion, to remain off screens (couldn't remember how long), had a sports competition next week and was told could participate as long as she was feeling well
4	Stay in a room with no light, no TV, mobile phone for 2 weeks. Stayed off school for 2 days. Hospital said when he returned to school, to go in for half days and this was done for about 1 weeks. Stayed off sports for 1 week - excluded from PE
5	Told it was not concussion as he did not black out. Don't play rugby for 2 weeks and take paracetamol for headache. Take it easy
6	Brain rest (no screens) for 1 week, attend headache clinic if concerns, if symptoms worsen or develops more serious symptoms such as vomiting to return
7	Lie flat, stay away from physical activity - no specific time frame
8	Not to play football or sports for a couple days, avoid screens as much as possible - no clearly defined period of time. Father felt he had to decide
9	Provided with a leaflet, 1 month off sports, off screens 1 day
10	Off physical education at school for 2 weeks, off school for 1 week, do not watch screens for 24 hours
11	No rugby for a while, stay away from sports
12	Stay at home, not to attend school for 2 weeks
13	Not to look at screens

DISCUSSION

Head injuries are common with an incidence of approximately 3.4% of all PED patients [15]. Our department receives a total of 42,000 patients per annum which would predict around 1400 children with head injury. Training in the diagnosis and management of head injury is important for PED staff including all potential outcomes such as concussion. The 49 patients with concussion in our cohort likely represents an underdiagnoses of the condition confirming findings in previous studies [7-9].

Children and young people are prone to concussion in sports [15], and this is reflected in our data with 51% of concussions occurring during sporting events. Anatomical differences, risk taking behaviour and skills acquisition all play a role in sustaining a head injury as a child. If we analyse play as a broader category including the school yard, home and play parks this accounts for 21/49 (43%) of concussions, the second biggest category. Children remain vulnerable in all situations [16]. The classic triage of headache, nausea and dizziness accounted for 64% of symptoms although it remains important to recognise the many physical, emotional, cognitive and mental health aspects of concussion symptomatology [17,18].

Regarding advice given to patients and their families on discharge, 35/49 (71%), of families received a patient information leaflet or documented verbal advice consistent with current concussion protocol. However, of the patients contacted by telephone, 13/29 (45%) recounted incorrect or contradictory advice. The subsequent median duration of symptoms was 7 days with a mean of 27 days which is broadly in keeping with current literature [19]. It is a concern, though, that symptom severity and duration may have been impacted by misinformation.

Results from our study indicate that physicians may lack a basic understanding of concussion management even when supplying patients with written information. Parents and carers should not be expected to verify advice. In a large cosmopolitan city less than fluent English language proficiency in immigrant groups adds to the challenge of understanding patient information literature.

While it is encouraging that literature on the management of concussion was given to the majority of patients, the recognition, discharge advice and patient support post discharge could to be improved.

Regular repeated teaching is required to tackle this gap in training amongst the PED team. Post discharge patient support must be developed to ensure adherence to protocols at home via the general practitioner service by the creation of a concussion clinic in PED. Such a hub in support of families, health professionals, schools and sports communities would be a boost in the management of concussion

LIMITATIONS

While this study is small it is encouraging that results for symptom duration and the prevalence of sports concussion agree with current literature. As a retrospective study we were reliant on documentation for data extraction which is sometimes incomplete. Also the telephone respondents may not have remembered details of their children's presentations accurately up to a year post injury. There is always the potential for bias with human contact and while utilising three callers for the telephone survey will hopefully have limited this, the potential for bias remains

CONTRIBUTORSHIP

Dr Stewart designed the study, gathered data, co-wrote and edited the submission

Dr Houbby gathered data and co-wrote the submission

Dr Chawla gathered data and co-wrote the submission

ETHICS

This service evaluation was registered locally in keeping with the General Medical Council's Good Practice in Clinical Governance Guidelines. The project was undertaken in accordance with the Trust Research and Development guidelines; ethics approval was not required by the hospital trust Research and Ethics Committee which approved the study.

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