Available online at www.sciencedirect.com

SciVerse ScienceDirect

British Journal of Oral and Maxillofacial Surgery 52 (2014) 124–127

BRITISH Journal of Oral and Maxillofacial Surgery

www.bjoms.com

Equine-associated maxillofacial injuries: retrospective 5-year analysis

Shofiq Islam [a,*], Benjamin Gupta [b], Christopher J. Taylor [c], Jeffrey Chow [b], Gary R. Hoffman [d]

[a] *Department of Maxillofacial Surgery, Leicester Royal Infirmary, Infirmary Square, Leicester LE1 5WW, UK*
[b] *Department of Oral and Maxillofacial Surgery, The John Hunter Hospital, Newcastle, New South Wales, Australia*
[c] *Wessex Deanery, Southern House, Ottobourne, Hampshire, UK*
[d] *University of Newcastle, Consultant Maxillofacial surgeon, The John Hunter Hospital, Australia*

Accepted 23 September 2013
Available online 26 October 2013

Abstract

We explored the relation between the causes of facial injuries in equestrians and the presence or absence of associated injuries. Over a 5-year period we retrospectively reviewed all patients who presented to the John Hunter Hospital, New South Wales, with facial injuries that had resulted from activity with horses. We analysed the rates of hard and soft tissue injuries, and of associated injuries by sex and mechanism. A total of 85 patients were included (50 female and 35 male) with an age range of 2–88 years. There was a significant difference in the rate of maxillofacial and associated injuries when groups were analysed for sex and mechanism of injury. Facial injuries caused by falling from a horse were more often associated with other injuries in men than in women ($p < 0.05$), and men were 4 times more likely to present with associated injuries than women (OR 3.9; 95% CI 1.1 to 14) We also found significant differences in the rates of facial fracture. Women who had been kicked by a horse were more likely to sustain bony injuries than men ($p < 0.05$). Our data confirm the association between kicks and facial fracture, and this may provide an impetus for the development of appropriate protective equipment. Patients who sustain facial injuries when falling from a horse often present with associated injuries and this has practical implications for clinicians involved in their management.

Keywords: Equine; Trauma; Facial fracture; Horse related; Maxillofacial injury; Australia

Introduction

The John Hunter Hospital is a tertiary referral trauma centre in the Hunter-New England region of New South Wales, Australia, with an urban and rural catchment area of roughly 130,000 km^2. It is the only level 1 trauma centre outside metropolitan Sydney, and serves a population of about 850,000. Horses are used recreationally and commercially in this region, and many of the injuries seen are caused by equestrian activities. These injuries can result in considerable morbidity, but rarely in death. Many papers have examined facial injuries caused by equestrian activity,[1–4] but few focus on the incidence of such injuries and those associated with them. This has potential relevance for the composition of trauma teams in departments that treat patients injured in this way.

We retrospectively explored patients' characteristics and the type of maxillofacial injuries caused by horses in those who presented to the John Hunter Hospital. We considered the mechanism, the resulting facial injury, and the rate of associated injury. In particular, we evaluated the relation between the mechanism (falls from a horse compared with kicks) and the presence, or absence of other associated trauma. We also looked at the relation between the mechanism and the characteristics of the corresponding facial injury (hard

* Corresponding author. Tel.: +44 0300 303 1573.
E-mail address: drshafiqislam@hotmail.co.uk (S. Islam).

0266-4356/$ – see front matter
http://dx.doi.org/10.1016/j.bjoms.2013.09.019

tissue compared with soft tissue), and considered potential differences in the rate of associated patterns of injury when stratified according to sex.

Method

We retrospectively analysed trauma data over a 5-year period of patients who presented to the John Hunter Hospital with maxillofacial injuries caused by horses. Patients who matched our inclusion criteria were identified using the International Classification of Diseases 10 (ICD-10) clinical coding system. Data were retrieved from medical records and included patients' characteristics, mechanism of injury, and injury pattern. From this dataset we explored 2 questions. The first concerned whether the mechanism of injury (fall or kick) was associated with other injuries, and the second asked whether the mechanism influenced the presenting injury pattern.

The main predictor variable was mechanism of injury; the other was sex. The first outcome variable was the presence or absence of associated injuries (head, back, chest, or limb). The second was whether or not patients sustained bony or isolated soft tissue facial injuries. Those who had facial fractures with or without soft tissue injury were placed in the bony injury group.

This study qualified for exemption according to the criteria of our local institutional review board. The data were analysed using SPSS version 10 for Windows (SPSS Inc, Chicago). Patients' characteristics were assessed using frequency and descriptive statistics. The chi square test was used to analyse categorical variables. Probabilities of less than 0.05 were considered significant.

Results

We identified 85 patients whose facial injuries resulted from activity with horses. There were 50 female and 35 male patients. The median age of male patients was 40 years and of female patients was 24 years. Of the study sample, 36 patients (42%) were female and under 30 years of age.

Most of our patients ($n = 53$, 62%) were injured during recreational activities. Only 13% ($n = 11$) were injured when working, and in all these cases horses were being handled without the use of protective equipment. The remaining 25% were unknown. A total of 35 injuries resulted from kicks and 39 from falls; 11 were caused by trampling, dragging, biting, or head butting.

Roughly one third of our group (34%, $n = 29$) sustained facial and associated injuries. The remaining 66% ($n = 56$) had isolated facial injuries. Associated injuries were seen in nearly half (46%, $n = 18$) of those who had fallen and in roughly a quarter (23%, $n = 8$) of those who had been kicked. Falls were associated with other injuries in 11 of the 17 men, and in 7 of the 22 women (Table 1).

Table 1
Mechanism of injury, sex, and associated injuries. Data are number.

	Men			Women		
	Falls	Kicks	Other	Falls	Kicks	Other
Associated injuries	11	2	3	7	6	0
No associated injuries	6	10	3	15	17	5

There was a lack of documentation on the use of helmets on presentation to the emergency department. Only 29% ($n = 25$) of the records reviewed had clear documentation, and use of a helmet was recorded in only 20% ($n = 17$) of cases.

There was a clear difference in the patterns of injury between men and women. Men had significantly more facial and associated injuries than women (11/17 in men compared with 7/22 in women, $p = 0.04$) when falls were compared, and were nearly 4 times more likely to present with associated injuries than women (OR 3.9; 95% CI 1.1–14).

There was no significant difference between the sexes with regard to maxillofacial and associated injuries in those who had been kicked. Based on mechanism, in men there was a marked difference between the incidence with which associated injuries occurred (11/17 for falls and 2/12 for kicks, $p = 0.01$). Men who had falls were 6 times more likely to have associated injuries then those who had been kicked (OR 6.5; 95% CI: 1.5–28; $p < 0.05$). In contrast, rates for maxillofacial and associated injuries in women were similar for falls (7/22) and kicks (6/23) (Table 1).

The most common facial injuries in our group were isolated soft tissue injuries ($n = 48$; 56%). The remainder were hard tissue injuries ($n = 37$; 44%). Most commonly, facial fractures involved the midfacial structures (maxillary or orbitozygomatic complex fractures) ($n = 36$; 58%). Mandibular fractures accounted for a further 24% ($n = 15$) and others accounted for the remaining 18% ($n = 11$) (Table 2).

There was a clear difference in injury pattern between men and women when mechanism was considered. Of those who had been kicked, 6/12 men and 19/23 women had hard tissue injuries ($p = 0.04$). In women, kicks were nearly 5 times more likely to cause bony injuries than in men (OR 4.7; 95% CI 1.1–23). Falls predominantly caused soft tissue damage and there was no significant difference between the sexes (Table 3).

Table 2
Number of maxillofacial fractures caused by activity with horses.

	No.
Mandibular	15
Dental	6
Maxillary	2
Zygomatic	9
Nasoethmoidal	2
Nasal	9
Orbital	14
Frontal	5