Injuries associated with recreational horse riding and changes over the last 20 years: a review

Nemandra Sandiford1 • Christopher Buckle2 • Uthman Alao3 • Jerome Davidson3 • James Ritchie3

1Department of Trauma and Orthopaedic Surgery, Conquest Hospital, The Ridge, Hastings TN37 7RD, UK; 2Department of Trauma and Orthopaedic Surgery, Tunbridge Wells Hospital, Pembury, Tunbridge Wells TN2 4QJ, UK; 3Department of Trauma and Orthopaedic Surgery, Kent and Sussex Hospital, Tunbridge Wells, UK

Correspondence to: Nemandra Sandiford. Email: nemsandiford@hotmail.com

Summary

Objective: To assess the incidence and distribution of recreational equestrian injuries seen in the Kent and Sussex region and review the available literature on this subject.

Design: This is a retrospective case series with historical controls.

Setting: Kent and Sussex region, England.

Main outcome measurement: Injuries related to horses in the recreational setting.

Methods: Subjects were selected from our acute injury database. Notes of all patients presenting with horse riding-related injuries between January and December 2010 were reviewed. Skeletal injuries were confirmed using our Picture Archiving and Communications Systems (PACS) system. Data were tabulated and grouped using Microsoft Excel software. Statistics were calculated using Graph Pad software.

Results: During the study period, 155 patients presented with a total of 199 injuries related to horses, accounting for 0.3% of all presentations; 69% were soft tissue injuries. The most commonly affected areas were the extremities (77 patients, 49.7%) followed by injuries to the head (38 patients, 24.5%) and trunk (36 patients, 23.2%). Seventeen patients (11%) were admitted. Patients presenting with head injuries suffered significantly more injuries compared to other groups (1.65 compared to 1.4 injuries, \( p < 0.0002 \)).

Conclusion: A larger number of persons were riding for a longer period of the year compared to previous studies in the United Kingdom. There was also a shift in the patterns of injury seen in this population over the last two to three decades.

Introduction

Equestrian activities are extremely popular in the United Kingdom. In Great Britain alone, approximately 4.3 million people ride horses. In the greater London area, 135,000 horses are registered, most being ridden for recreational reasons.

Added to this is the economic impact of the equestrian industry which is worth £7 billion and provides employment for 220–270,000 persons. Equestrian sports are thought to be more popular than rugby or cricket in the UK. Despite this, recently, there is little information on the rates
and patterns of injury occurring in this population.

The Sussex region is advertised as an area of outstanding countryside, and due to this, there is a large population of persons who ride horses recreationally. While the incidence and patterns of injury in professional jockeys has been well documented, there is a relative paucity of similar data in groups such as the population presented in this study. The Kent and Sussex Hospital is one of the largest hospitals in this region. It serves a primary local population and is a referral centre for several minor injury units. This study aims to assess the epidemiology of injuries associated with recreational horse riding in our region and provide an update on this subject.

**Patients and methods**

All patients presenting to our Accident and Emergency Department (AED) with horse riding (HR)-related injuries are logged as ‘horse-related injury’ and entered into our AED trauma registry. This retrospective study was performed between January and December 2010. Data were extracted from our Emergency Medicine database. All patients presenting with HR-related injuries during the study period were extracted and their notes were reviewed. Skeletal injuries were confirmed using our Picture Archiving and Communications Systems (PACS) radiology system, on which all radiographic images are stored.

Data were tabulated and analysed using Microsoft Excel software (Microsoft Corporation, WA, USA). Statistical analysis was performed using the chi-squared test (Graph Pad Prism software CA, USA).

**Results**

Between January and December 2010, 49,238 patients presented to our emergency department. Of these, 155 patients (144 women and 11 men) presented with a total of 199 injuries related to HR activities, accounting for 0.3% of all presentations for this period. The temporal distribution of injuries is illustrated in Figure 1. Injuries occurred most frequently as a result of falls from the animal followed by kicks, bites and two patients were...
trod on by the animal, one sustaining a fracture. In two cases, the horse fell onto the rider after they had fallen off resulting in a secondary crush injury (Table 1).

### Injury patterns

One hundred and six [see Table 2] patients (68% [i.e. 106/155]) suffered soft tissue injuries (STIs) (Table 2). Thirty-eight percent of injuries were right sided, 43% occurred on the left side and two patients (1%) had bilateral injuries. Other injuries were central, i.e. back, neck and head injuries. There were no fatalities.

#### Head injuries

Head injuries occurred in 38 patients (35 women and 3 men). The average age of this group was 24 years (range 3–64 years) (Figure 2). These were all due to falls. Two patients lost consciousness for <5 min and at presentation their Glasgow Coma Scores were 15. Eighteen patients in this group had other injuries. Of these, nine (50%) had neck injuries.

Three moderate head injuries occurred in children aged 3, 8 and 15 years secondary to falls from a horse. These patients were admitted and discharged after a 24-hour period of observation.

#### Limb injuries

These were the most common injuries, occurring in 77 patients (71 women and 6 men) and accounted for 39% of all injuries seen in this study; 33 injuries (43%) were left sided and 42 (55%) were right sided, and injuries were bilateral in two cases. Multiple injuries occurred in 21 (27%) patients. The average number of injuries in patients presenting with limb injuries was 1.4 (range 1–4 injuries). Fractures occurred in 14 (18%) cases. The mechanism of injury was a fall in 12 cases. Two patients were kicked by the animal, suffering orbital and pelvic fractures.

#### Truncal injuries

Thirty-six patients (23%) suffered injuries to the chest and abdomen. All patients were women. Injuries occurred to the chest (seven cases), back (26 cases), pelvis (two cases) and abdomen (one case). Multiple injuries occurred in eight patients (22%). The average number of injuries in this group was 1.4 (range 1–4).

**Table 1.** Mechanism of injury.

| Mechanism of injury | Men | Women | Total |
|---------------------|-----|-------|-------|
| Falls               | 8   | 129   | 137   |
| Kick                | 2   | 9     | 11    |
| Bite                | 1   | 4     | 5     |
| Trod on             | 0   | 2     | 2     |

**Table 2.** Distribution of injuries within this cohort.

| Pattern and distribution of injuries | STI | HI | Limb | Trunk | Fracture | Admissions |
|-------------------------------------|-----|----|------|-------|----------|------------|
| Total                               | 106 | 38 | 77   | 36    | 14       | 17         |
| Women                               | 99  | 35 | 71   | 36    | 12       | 16         |
| Men                                 | 7   | 3  | 6    | 0     | 2        | 1          |
| Children                            | 33  | 16 | 28   | 3     | 4        | 7          |
| Multiple injuries                   | 31  | 18 | 21   | 8     | 2        | 5          |
| Right side                          | -   | -  | 42   | -     | -        | -          |
| Left side                           | -   | -  | 33   | -     | -        | -          |
| Average number of injuries (range)  | 1.35 (1–4) | 1.65 (1–4) | 1.4 (1–4) | 1.4 (1–4) | 1.4 (1–4) | 1.55 (1–4) |

STI: soft tissue injuries.
Fractures

Fourteen patients (12 women and 2 men) suffered fractures. Ten (71% [i.e. 10/14]) of these were due to falls. Two patients were kicked and one suffered a fractured hallux after being trodden on.

Admissions

Seventeen patients (16 women and 1 man; 11% of all presentations) required acute admission. Five of these patients (29%) suffered fractures. Seven patients (41%) in this group were children. Sixteen cases resulted from falls and one suffered a head injury as a result of a kick from a horse. Two patients required surgery – one to have closure of a facial laceration and one required reduction of a fracture dislocation of their shoulder.

One patient required admission to the intensive care unit (ICU). This patient had multiple organ injury including a pneumothorax, splenic rupture and blunt hepatic injury. These injuries resulted from a fall from a jumping horse. The rider wore no body protection. This group is summarized in Tables 2 and 3.

Use of protective equipment

One hundred and fifty-two patients (98% [i.e. 152/155]) wore protective helmets. Of these, 95 were aware that their helmets met industry standards. These were also the patients who were aware of the existence of industry standards. One hundred and forty patients wore protective body armour and all wore riding boots.

Discussion

HR has been described as one of the most dangerous sporting or recreational activities. The risk of fatal injury is comparable to motorsports. Horse riders are one of the top four groups targeted for a reduction in sport and recreational injuries by the Commonwealth Injury Prevention Department.

During the period of our study, HR-related injuries accounted for 0.34% of all presentations to our AED. This is comparable to centres in the UK which contain professional horse racing circuits within their catchment areas. Most injuries

Table 3. Overview of patient population.

| Categories            | Men | Women | N  |
|-----------------------|-----|-------|----|
| Age                   |     |       |    |
| ≤16 years             | 6   | 44    | 50 |
| >16 years             | 5   | 100   | 105|
| Fractures             | 2   | 12    | 14 |
| Admitted              | 1   | 17    | 18 |
| Multiple injuries     | 3   | 36    | 39 |

Figure 2. Age distribution of our cohort.
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level of clinical suspicion when assessing these patients.

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