Common injuries in athletic horses at riding clubs in Tehran, Iran

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Abstract

Various forms of intensive sport place stress on the musculoskeletal system of the horse, during both racing and training. The musculoskeletal system of the horse has an inherent ability to adapt to the demands of high speed exercise, but exceeding the threshold of adaptive capacity may result in some form of damage. Continuing racing or training may delay the repair process and put the horse at risk of more serious musculoskeletal injury. This study investigated injury in different breeds of horses involved in various types of activity in riding clubs in Tehran. Of the 400 horses that took part in various events during the race season from March 2008 to September 2009, 26 were injured. The most common injury was to the musculoskeletal system of the fore limbs (64%). The hind limbs suffered 16% of the injuries and the head and neck 4%. From a gender aspect, incident rates were higher in mares (54%) than in stallions (46%). From a breed point of view, Thoroughbred and Arab horses had higher incident rates (100% and 85% respectively) than a hybrid horse (50%). Findings of this study also showed the relationship between gender, breed and age of the horses to the injury site, type and outcome, and type of the events.

Introduction

Injuries and accidents to horses are common, especially in high-speed sports such as racing and eventing (williwms *et al*., 2001, Perkins *et al*., 2005). In racing, horses can gallop at up to 65 km/h, which may contribute to the rate of injury. Equine injury has a high rate of morbidity and mortality, and this rate is increasing (Turner *et al*., 2008).

The most common type of injury is musculoskeletal damage in the forelimbs (Bailey *et al.,* 1998; Ueda *et al.,* 1993), which has been reported worldwide (Bathe 1994). Different climatic conditions may influence the type of injury; for example in Australia, injury rates were found to be especially high in tendons and ligaments of the forelimbs (Boden *et al.,* 2006), whereas sesamoid bone injuries are the most common type in the USA (Pelosoet, 1994). These differences may be due to the various methods in preparation of surfaces of the training field.

According to finding of the researches conducted on horse riding injuries, the events have been divided in to Voluntary Events (VE) and Involuntary Events (IVE) (Perkins 2005). Voluntary Events (VE) means that, the horse had no injuries so there is no prevention of training or racing.

Involuntary Events (IVE) refer to those events in which the horses affected with injuries during the training or race and the trainer forced to expel the horses from race-course or annihilated them. Types of injuries in IVE classified to musculoskeletal, respiratory and all other systems. Proportions of musculoskeletal injuries, respiratory and other injuries in the IVE events (78.8%, 15.6%, 5.6%, respectively), shows that injuries of musculoskeletal systems are important reason for the involuntary break in the training and participation's process. The present study was performed to explore the effects of gender, breed, age and weight of the horse on injury criteria.

Materials and Methods

A total of 400 horses of different breeds (Thoughroughbred, Torkman, Arab and Dokhon) and of both sex (mare and stallion) between two and 16 years old were selected for this experiment. The horses were pre-checked (by physical examination specially in the head and neck and in the limbs region) for any injury or physical abnormalities. During the race season (March 2008 – Sept 2009) data were collected from 26 riding clubs in the Tehran province of Iran through questionnaires. First, redundancy of questions was accounted for and then questionnaires were cross-indexed. The data were analyzed to investigate the relationship between criteria such as type of competition, horse age, breed, gender and weight with the injury location, type and outcome.

Results

Of the 400 horses studied, 26 (7%) suffered injury. The most common site of injury in the forelimbs (64%), (Figure 1), followed by the hind limbs and abdomen (16% each) and 4% in the head and neck.

The highest proportion of forelimb injuries occurred in hybrid horses (Figure 2) while the lowest rate was reported in the Torkman breed.

Figure 1: The incidents were mostly reported in the fore limbs of the injured horses.

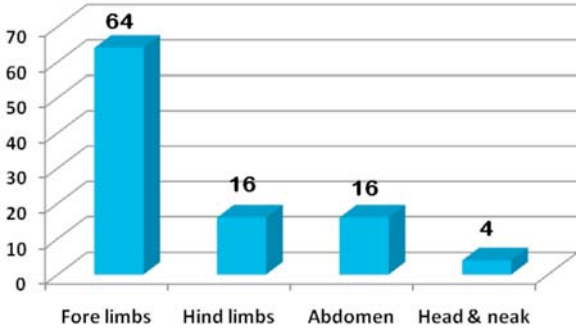
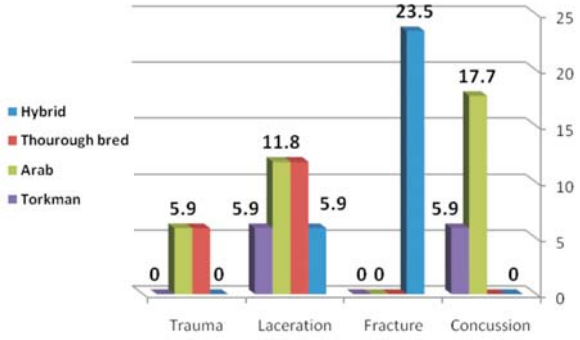


Figure 2: Types of the injury, fracture and laceration were mostly seen in Hybrid (Dokhon) and Arab breeds respectively.



Relationship between gender, injury location, type and outcome, climate and type of the event

Forelimb injury was most prevalent in mares (71 %) (Figure 3). Mares were most commonly injured in a mild climate, were most frequently injured in showjumping events (Figure 4) and also showed a higher degree of laceration and fracture than stallions (Figure 5).

Relationship between breed and injury location, type and outcome and type of event

Forelimbs fracture was most common in hybrid horses (Figures 2 and 6). In hybrid horses, balance of obliterate is more than other breed. Arab horses were mostly injured in showjumping events compared to hybrid horses, which were mostly injured during racing (Figure 7).

Figure 3: Most of the incident rates were observed in mares when compared to stallions.

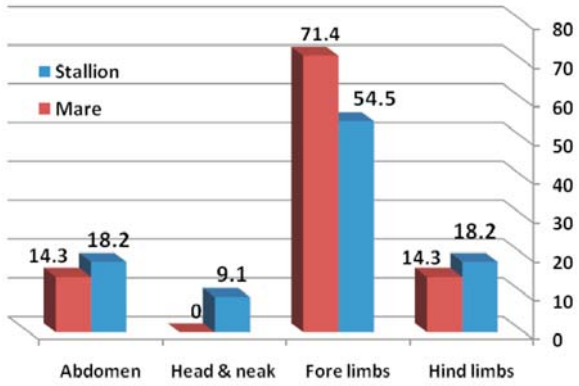


Figure 4: The proportion of sex to type of the event.

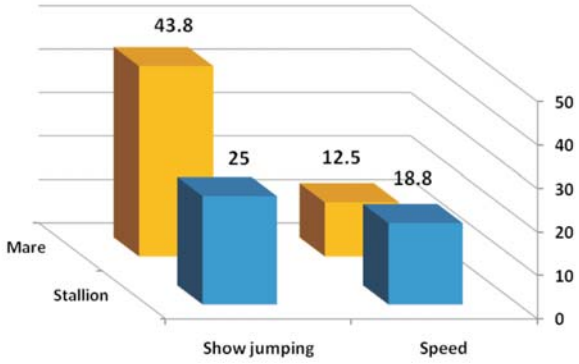


Figure 5: From the gender point of view, laceration and fracture were mostly seen in mares.

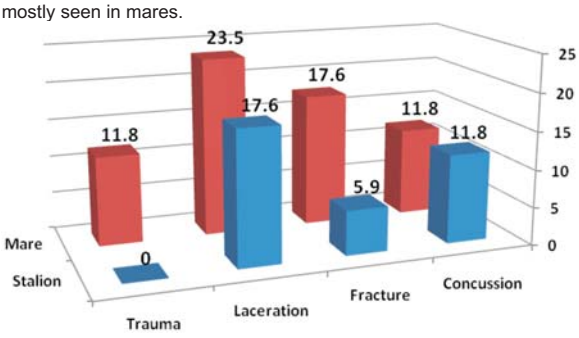


Figure 6: Proportion of breed and site of injury, hybrid (Dokhon) were injured more in forelimbs than other sites.

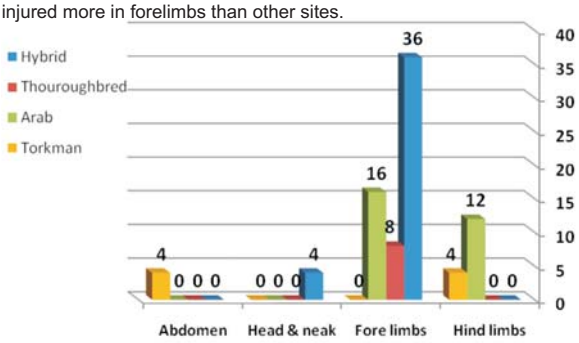


Figure 7: The proportion of the breed to type of the event.

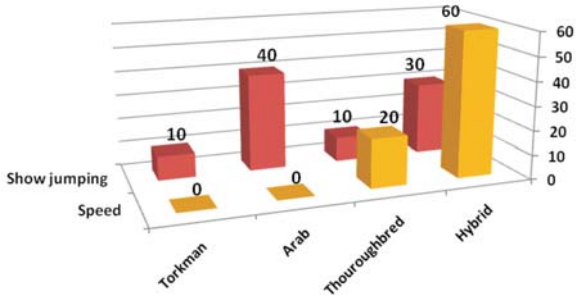


Figure 8: Young horses (2-5 years old) were injured more in their forelimbs when compared to other age groups.

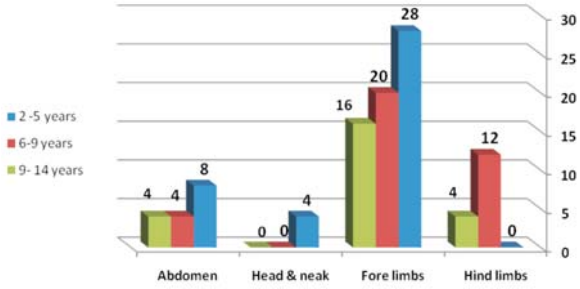


Figure 9: The proportion of the horse's age to the types of the injury.

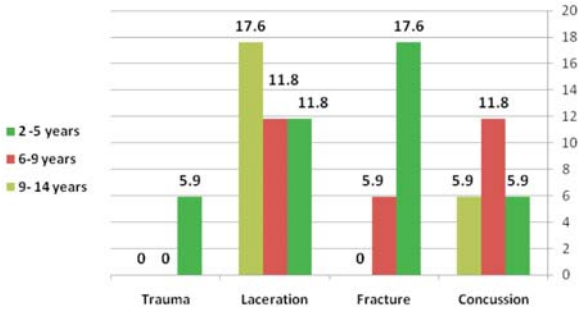


Figure 10: Horses weighted 400-500 kg, were more injured when compared to horses of other weight groups.

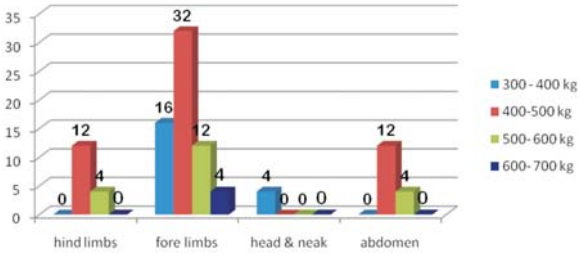


Figure 11: The proportion of horse's weight to the types of the injury.

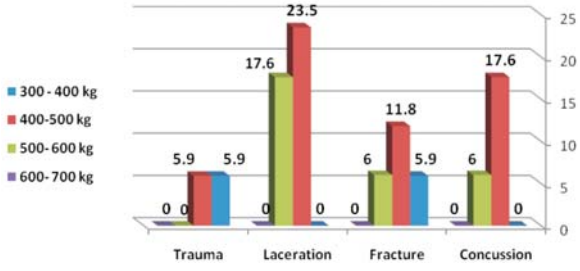
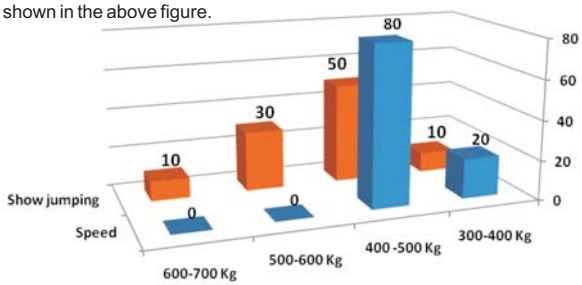


Figure 12: The proportion between the weight and type of the event is shown in the above figure.



Relationship between age and injury location, type and outcome, climate and type of event

Forelimbs were the most common site of injury in horses between two and five years old (28%) (Figure 8). In terms of injury type, fracture and laceration were most commonly seen in horses aged between 2 and5 years, and 9 and 14 years (Figure 9). Euthanasia was most frequent in the youngest horses, and horses aged 6 to 9 years old were mostly injured in a mild climate.

Relationship between weight and location, type and outcome of injury, and type of event

Forelimb injuries were mostly seen in horses that weighed between 400 and 500 kg (Figure 10), and in these horses the most common type of injury was laceration (Figure 11) in racing (Figure 12). Complete recovery, interim effect and euthanasia is most common in 400 to 500 kg horses (83%).

Discussion

Unfortunately, horses are commonly injured during racing and jumping events. Finding the mechanisms that lead to injury is important to minimize the relative risks and causes of horse injuries. Another possible factor in reducing or preventing injury could be to change stockyard or racecourse design, or to alter horse training methods. The percentage of musculoskeletal and respiratory IVE injuries from the current study (71% and 19% respectively) was similar to other reports (Williams *et al.,* 2001; Perkins, 2005). The former study stated that the percentage of days of training lost due to musculoskeletal injuries (MSI) and respiratory problems in Britain were 68% and 22%, respectively. In this study, the veterinarian was responsible for 100% of the diagnoses associated with fractures, 75% of bruises, 65% of tendon and ligament injuries, 61% of lameness with no fracture and 45% of cases of back disorders. Trainers appeared to be less likely to request veterinary assistance for more common conditions that were less likely to required comprehensive treatment, and more likely to request veterinary assistance for more serious injuries requiring surgical treatment. Horses coming back into work after

MSI had a fairly high risk of re-injury (55%). These horses were also more likely to suffer from non-fracture-related lameness compared to those horses that had not suffered any previous injury, consistent with the findings of Perkins *et al.* (2005). Age was influential on injury rates, with the highest rates occurring in horses two to five years old. This finding is consistent with work by Rossdale *et al.* (1985), Lepage *et al.* (2001) and Perkins *et al.* (2005). The gender of the horse was found to affect the type of injury. Results showed that mares were more likely to incur fracture and rupture, is in contrast with the finding of Perkins *et al.* (2005), where male horses were more likely to incur tendon and ligament injuries. Euthanasia of a horse because of an MSI depends on the type of injury; the worst case is a fracture or damage to tendon or ligament, followed by laminitis and osteomyelitis (Moyers *et al.,* 1991; Young *et al.,* 1991).

Equine injury is most frequently caused by an unsuitable surface, road accident, an unsuitable temperament and poor management. A fall, which can occur for a number of reasons, can result in a wide range of injuries from bruising and grazing to broken bones, spinal injuries and brain damage. Of all horse riding activities, race jumping is the most likely to produce musculoskeletal injuries, especially in young horses aged between two and three years old horses (Mores, 1999). Leg pain is common in young horses of both sexes, whereas injuries to tendons and ligament are more common in older stallions than in mares. Horses require veterinary attention from humans for optimal health and a long life. This is especially true in performance horses that experience a high degree of stress in their bones and joints during jumping and galloping. In this study, a high percentage of performance horses developed MSI, especially if they were worked intensely when young or on a poor surface. Horses that had previously been injured showed a higher risk of re-injury compared to horses that were not previously injured. One important aspect of equine management is post-injury care of joints and limbs to reduce the progression of MSI. The horse's schedule can be altered to reduce the number of days on which jump training occurs. A trainer can also reduce injury by avoiding work on hard ground, and conditioning and training the horse in such a way that he "peaks" before a competition rather than keeping him in intense work year-round. This tactic can help increase the useful working life of the horse.

Horses subjected to hard work may need additional attention, such as routine observation of the limbs to detect lacerations or swelling. Husbandry such as hosing the leg to remove dirt and ease any minor inflammation to the tendons and ligaments may be of use, and impact injury can be reduced with the use of boots or bandages. If the horse has been overworked, injured, or is to travel, a standing bandage or shipping boot may be placed on the horse's legs for protection, to hold a wound dressing, or to provide support.

References

1. Bailey, C. J.; Reid, S.W.J.; Hodgson, D.R.; Bourk, J.M. and Rose, R.J. (1998) Flat, hurdle and steeple racing: Risk factors for musculo-skeletal injury. Equine Vet. J., 30 (6): 498-503.
2. Balendra, G.; Turner, M.; McCrory, P.M. and Hallay, W. (2007) Injuries in amateur horse racing (point to point racing) in Great Britain and Ireland during 1993-2006. Br. J. Sports Med. 41 (3): 162-166.
3. Bathe, A.P. (1994) Fractures in Thoroughbred race horses: Results of a 2 year prospective study in Newmarket. Proc. Am. Assoc. Equine Pract. 40: 175-176.
4. Boden, L.A.; Anderson, G.A.; Charles, J.A.; Morgan, K.L.; Morton, J.M.; Parkin, T.D.H.; Slocombe, R.F. and Clarke, A.F. (2006) Risk of fatality and causes of death of Thoroughbred horses associated with racing in Victoria, Australia: 1989-2004. Equine Vet. J., 38: 312-318
5. Johnson, B.J. (1991) A look at racetrack break bones. J. Equine Vet. Sci. 13: 129-132.
6. Lepage, O.M. Carstanjen, B. and Uebelhart, D. (2001) Non-invasive assessment of equine bone: an update. Equine Vet. J., 161: 10-22.
7. Mores, S.J. (1999) A longitudinal study of racing Thoroughbreds: Performance during the first years of racing. Aust. Vet. J. 77: 105-112.
8. Moyers, W.; Spencer, P.A. and Kallish, M. (1991) Relative incidence of dorsal metacarpal disease in young Thoroughbred racehorses training on two different surfaces. Equine Vet. J. 23: 166-168.
9. Parkin, T.D.H.; Clegg, P.D.; French, N.P.; Proudmann, C.J.; Riggs, C.M.; Singer, E.R.; Webbon, P.M. and Morgan, K.L. (2004) Race course level risk factors for fatal distal limb fracture in racing Thoroughbreds. Equine Vet. J. 36: 521-526.
10. Peloso, J.G.; Mundy, G.D. and Cohen, N.D. (1994) Prevalence of, and factors associated with, musculo-skeletal injuries of Thoroughbred. J. Am. Vet. Assoc. 204: 620-626
11. Perkins, N.R.; Reid, S.W.J. and Morris, R.S. (2005) Profiling the New Zealand Thoroughbred racing industry I: training, racing and general health patterns. NZ Vet. J. 53 (1): 23-39.
12. Rossdale, P.D.; Hopes, R.; Digby, N.J. and Offord, K. (1985) Epidemiological study of wastage among racehorses 1982 and 1983. Vet. Rec. 116: 66-69.
13. Turner, M.; Balendra, G. and McCrory, P. (2008) Payments to injured professional jockeys in British horse racing (1996-2006). *Br. J. Sport Med.* 42 (9): 763-766.
14. Ueda, Y.; Yoshida, K. and Oikawa, M. (1993) Analysis of race accident conditions through use of patrol video. J. Equine Vet. Sci. 13: 707-710.
15. Young, D.R.; Nunamaker, D.M. and Marked, M.D. (1991) Quantitative evaluation of the remodeling response of the proximal sesamoid bones to training-related stimuli in Thoroughbreds. Am. J. Vet. Res. 52: 1350-1356.