A preliminary retrospective survey of injuries occurring in dogs participating in canine agility

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Keywords
Sports medicine - general, Sports medicine - small animal, Epidemiology - general

Summary
Objectives: Little is known about the risks of injury to dogs participating in the relatively new sport of canine agility. The purpose of this study was to identify the factors that put the participating dog at risk as well as determine the anatomical sites that were most commonly injured.

Methods: A retrospective survey using a paper and web-based data collection instrument was used to evaluate dogs participating in the sport of canine agility.

Results: Of the 1627 dogs included in the study, 33% were injured, and of those 58% were injured in competition. Most injuries occurred on dry outdoor surfaces. Border Collies were the most commonly injured, and injuries were in excess of what would be expected from their exposure. For all dogs, soft tissue injuries were most common. The shoulders and backs of dogs were most commonly injured. Dogs were most commonly injured by contact with an obstacle. The A-frame, dogwalk and bar jump obstacles were responsible for nearly two-thirds of injuries that resulted from contact with the obstacle.

Conclusions: Border Collies are at higher risk for injury than would be expected from their exposure. The A-frame, dogwalk and bar jump obstacles put the shoulders and backs of dogs at risk.

Clinical Relevance: For the first time, this study gives us insight into injuries occurring in dogs participating in canine agility. This will help direct prospective studies that evaluate the safety of individual obstacles, direct rule changes and enable practitioners to understand the risks of the sport.

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Introduction
Since its beginnings as an event at the 1978 Crufts Dog Show in England, the sport of dog agility has become the fastest growing sport of canine agility. The purpose of this study was to identify the factors that put the participating dog at risk as well as determine the anatomical sites that were most commonly injured.

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Materials and methods

Agility handlers were asked to fill out a one-page web-based or paper injury data collection instrument (DCI) (Appendix 1, viewable online at www.vcot-online.com). An instruction sheet was included and handlers were asked to complete the DCI regardless of whether their dog had been injured or not. Handlers were instructed to fill out a separate form for each injury to a given dog. The DCI included questions on age, size and breed. Owners were asked to report whether a dog was able to continue at the time of the injury, required time off from the sport, or needed medical attention. Dogs were considered to have been injured if they had to discontinue practice or leave a competition course (time-loss). Owners were asked the anatomical location and type of injury, field conditions at the time of injury, and the cause of injury. If the injury was considered to have been a contact injury, the obstacle causing the injury was reported. Chronic and overuse injuries were recorded as well.

The paper and web-based DCI were identical in content and similar in format. Distribution of the DCI was managed with the help of Clean Run magazine, a monthly publication with a subscription base of 10,000, a web site and a very active web group; all three dedicated exclusively to the sport of canine agility. An initial posting was placed on the web group on November 2, 2005 notifying handlers that the survey was on the web site. The paper format DCI was included in the January 2006 issue of Clean Run. A second posting appeared on the web site in January of 2006 reminding handlers of the survey. Handlers were asked to record all events that had occurred in the two years prior to the survey. The collection period ended on February 1, 2006. The data from the completed electronic and paper forms were recorded and then managed using computer software. Descriptive statistics were calculated, and charts were constructed using data management software.

Results

One thousand six hundred and twenty-seven DCIs were completed. Sixty-seven percent (n=1098) of the respondents indicated that their dog had participated without injury. Of the 529 reported injuries, 58 % of them occurred during competition with the remainder occurring during practice. The weight, height and age of the dogs did not statistically correlate with the rate of injury. Of the injured dogs, Border Collies, Australian Shepherds and Shetland Sheepdogs were most commonly injured (Fig. 1). While Border Collies accounted for 17 % (n=134) of uninjured participants, they made up 25 % (n=105) of the injured population. Using the Pearson chi-squared test it was determined that this variance from expected was significant to a p value of 0.0005.

Seventy-eight percent of dogs had their diagnosis confirmed by a veterinarian. Of the

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a Microsoft® Access 2003
b Microsoft® Office Excel 2003
dogs that were not brought for veterinary attention (and where time-loss was recorded), 71% had injuries that required less than four weeks to resolve (the vast majority being one or two weeks).

Soft tissue injuries including sprains, strains and contusions, were the predominant injury type. The shoulders (20%, n=107) and backs (18%, n=99) of dogs were most commonly injured. The stifle (12%), hip (6%), carpus (6%) and phalanges (6%) were injured less frequently. Border Collies injured their shoulders (15%), backs (13%), hips (10%) and carpi (9%) most frequently. Australian Shepherds injured their shoulders (26%), backs (21%), stifles (19%) and the phalanges (9%) most frequently. The shoulders (24%), backs (17%), carpi (7%) and thighs (7%) were most commonly injured in Shetland Sheepdogs.

Dogs were injured more frequently by direct contact with an obstacle (35%, n=193) than they were by contact with the ground (18%, n=98), slips and loss of footing (18%, n=100) or chronic and overuse injuries (17%, n=89). Slipping was the most common cause of non-contact injury. Respondents indicated that 64% (n=338) of the dogs were injured in obstacle related activities including 23 obstacle related injuries that were attributed to overuse. The vast majority of injuries (66%) occurred on dry surfaces. Thirteen percent of injuries occurred on rubber mats, while 11% occurred on wet and soft surfaces.

Time-loss (severity) was reported for 483 dogs. One hundred and ninety dogs sustained minor injuries (defined as loss of time from practice or competition of 6 weeks or less), 236 dogs sustained major or chronic injuries (time-loss greater than six weeks) and 57 dogs sustained injuries that forced their retirement from the sport. Three hundred and seven time-loss events were attributed to performance of an obstacle (not all of the 338 reported obstacle-related injuries recorded time-loss). Of those 307, 141 dogs (46%) had minor injuries and 128 (42%) were reported to have major or chronic injuries. Thirty-eight dogs (67% of the dogs retiring from the sport) retired as a direct result of an injury from performance of an obstacle. Of the dogs with obstacle-related minor injuries, 29% (n=41) occurred on the A-frame, 16% (n=23) on the dog walk and 16% (n=23) on a bar jump. Of the 128 dogs with obstacle related major or chronic injuries, 24% (n=31) were injured on the A-frame, 16% (n=21) on the dog walk and 11% (n=14) were injured on a bar jump. Thirty-four percent (n=13) of the dogs retiring because of an injury due to an obstacle were injured on the A-frame while seven dogs (18%) retired from the sport because of an injury on a bar obstacle. None of the retiring dogs were injured on the tyre. The majority (60%) of minor injuries occurred in competition as did half (51%) of the major (or chronic) injuries. Sixty-five percent of injuries that forced a dog to retire occurred in competition. Eight percent (n=15) of all reported minor time-loss injuries, 20% (n=48) of all major or chronic time-loss injuries, and 25% (n=14) of all retirements were considered to be the result of overuse. Twenty-three of
the 77 (30%) time-loss reported overuse injuries were related to the obstacles, particularly the weave poles and the A-frame.

The A-frame (29%), dog walk (19%) and bar jumps (17%) were responsible for nearly two-thirds (65%) of injuries resulting from contact with an obstacle (Fig. 2). The weave poles caused nine percent of injuries attributed to the obstacles while the seesaw and tyre obstacles were responsible for seven and six percent, respectively.

The A-frame, bar jump and dog walk obstacles most frequently caused injuries to the shoulders and backs of dogs (Fig. 3). Twenty-seven percent (n=26) of all injuries on the A-frame and 17% (n=10) of injuries on the bar jump were to the shoulder. Twenty-three percent (n=15) of all injuries on the dog walk and 17% (n=17) of all injuries on the A-frame were to the back. The phalanges and metatarsus were injured on the A-frame less than half as often as the shoulder (but a combined total of 23%). The thigh was the third most common anatomical site of injury on the bar jump and dog walk. Injuries to the carpus, stifle and neck were frequently seen on the bar jump.

In this study, the majority of dogs participated without injury. Border Collies, Shetland Sheepdogs and Australian Shepherds were injured most frequently but Border Collies were injured more frequently than would have been predicted by their exposure. The speed, agility and drive of the Border Collie may put it at risk of injury. While injuries occurred in greater numbers than would be predicted by exposure for the Great Dane, German Shepherd Dog and Labrador Retriever, the numbers of dogs of these breeds were too small for statistical validation. The A-frame and dog walk appear to stress the forelimbs of competing dogs. The number and location of injuries attributed to the bar jumps were unexpected. The A-frame and weave poles appear to be responsible for a larger proportion of overuse injuries. This survey did not support the concerns regarding the tyre.

In summary, this study is the first of its kind to evaluate injuries to the musculoskeletal system in a large population of dogs participating in agility. It was conceived as an attempt to uncover areas of concern, rather than to draw definitive conclusions regarding risks, and therefore, all conclusions must be considered to be preliminary. We recognise the possibility that misdiagnosis and faulty recollection may have influenced the accuracy of reporting and that it was not possible to correct for the possible bias inherent in self-selection. However, the findings of the study have enabled us to elucidate injury trends and thereby move on to directed evaluations of training techniques, breed vulnerability, and the risk of injury from the obstacles themselves. Finally, the fact that some possible areas of concern have been identified should motivate a proper prospective study that avoids the potential sources of bias and has the power to either confirm or disprove the findings reported here.

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References