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Original Research

Willingness of a Convenience Sample of Horse Owners to Use Stem Cell Therapy for the Treatment of Equine Tendon Injury and Factors that Influence This Decision



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ABSTRACT

Stem cell therapies offer huge potential for the treatment of tendon injury in horses. However, the factors influencing clients' willingness to use these therapies have not yet been investigated. This study examines the willingness of a population of horse owners to choose stem cell therapy for the treatment of equine tendon injuries and the factors that may influence this choice including treatment cost and efficacy, veterinarian advice, client knowledge, and success stories. A short, anonymous questionnaire was delivered to a convenience sample of equine owners. Questions related to (1) respondent background; (2) prior experience with tendon injuries and their treatment; (3) willingness to use equine stem cell therapy; and (4) the importance of factors that may affect their decision to use the therapy. Responses were summarized using graphical methods and compared using Fisher exact test where appropriate. Fifty-four percent of our cohort ($n = 113$) reported they would be willing to use equine stem cell therapy, 6% were not willing, and 40% were unsure. When asked to rank factors that would influence their decision, scientific proof that the therapy works was ranked highest followed by veterinarian advice. This result may have been influenced by the high proportion of tertiary-educated respondents recruited in this study. This is the first reported study to investigate the willingness of a population of horse owners to use stem cell therapy for their horses. Results suggest that the majority of these equine owners may consider using stem cell therapies for their horses given a larger positive evidence base was provided for the therapy.

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1. Introduction

Damage to tendons and ligaments constitute some of the most common soft tissue injuries presenting to the equine clinical practice [1,2]. They are observed across all

riding disciplines and are a source of considerable functional and economic loss in racing and high-level performance horses [1,2]. As such, the development of novel treatments with higher reliability and efficacy is an important ongoing area of research to improve outcomes for equine athletes suffering tendon injuries.

Recently, stem cell therapies have been advocated for the treatment of equine tendon injuries based on their reported ability to regenerate functional tendon tissue in vivo [3,4]. Despite considerable advances in the science of stem cell biology, the efficacy of stem cell-mediated repair of injured equine tendons is controversial with the

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current evidence base for clinical efficacy of the therapy showing conflicting results [5]. Some studies have shown that reimplantation of autologous mesenchymal stem cells into artificially induced tendon lesions encourages improved tendon healing [6–11], although others have shown no improvement over untreated controls [5,12]. However, variation between trials is unclear and may, in part, be because of the variable nature of the technique itself as it relies on isolation of such a discrete cell population in sufficient numbers to induce a positive outcome in the injured tissue [6–10,12]. As such, strong evidence supporting the efficacy of stem cell-mediated healing of equine tendon is currently lacking, and this is expected to be a significant factor in creating client skepticism of the therapy [5].

The objective of this study was to investigate the current willingness of a population of horse owners from Charles Sturt University (CSU), Australia, to use this therapy on their horses and to define the factors that would influence this decision. Understanding these elements is a key to effectively assisting clients in their decision to use, or decline stem cell treatment. Ultimately, the client will bear the cost of both the treatment and recovery and potential loss of earnings, value, or use if their equine athlete fails to return to the original level of performance after therapy. Therefore, the client plays the definitive role in the decision to treat or not to treat. The results of this study may aid in improving client–veterinarian relations in regards to the treatment decision-making process and in supporting the uptake of effective research in this area.

2. Materials and Methods

2.1. Survey Design

An anonymous questionnaire was designed to analyze the willingness of participants to use equine stem cell therapies. The questionnaire consisted of 24 questions relating to four main areas of interest: respondent's equine background; respondent's history with equine tendon injuries; respondent's knowledge of and willingness to use equine stem cell therapy; and the importance of factors identified by the authors that may affect respondent willingness. Questions relating to respondent's knowledge about the therapy were included to gauge whether lack of knowledge was influencing client willingness to use stem cell therapies. A copy of the questionnaire is available on request to the corresponding author. The short questionnaire was delivered in either a hard copy paper format or online via SurveyMonkey and consisted of mostly closed-ended questions with one open-ended question which asked respondents to clarify their reason for being unsure, willing, or unwilling to use stem cell therapy. This study was undertaken with the approval of the CSU School of Animal and Veterinary Science Human Research Ethics Committee.

2.2. Respondent Recruitment

Recruitment was aimed at individuals that currently own or have owned horses in the past attending CSU (Wagga Wagga, Australia) or equine clients that present to the CSU Veterinary Clinical Centre (VCC) (Wagga Wagga,

Australia). Recruitment was carried out using a convenience sampling method either by general request via CSU's staff and student communication sites or by direct recruitment of clients presenting horses to the CSU VCC, the University's primary accession clinic for equine cases. Friends, relatives, or colleagues of respondents were also recruited via word of mouth.

2.3. Data Analysis

All data were collated within SurveyMonkey with completed hard copy surveys being entered into the system by hand. Graphical methods and pivot tables were used for data summary and comparisons between results from selected questions were performed using Fisher exact test to identify any relationship in the data. Statistical analysis was carried out using SPSS and significance was set at $P < .05$.

3. Results

3.1. Respondent Demographics

A total of 113 respondents completed the questionnaire in its entirety. Eighty-seven percent (98/113) of respondents were staff or students of the School of Animal and Veterinary Sciences at CSU. Only 8% (9/113) of respondents were clients of the VCC alone, and 5% (6/113) were friends, relatives, or colleagues of staff, students, or clients. Of our cohort, 105 respondents currently own or had previously owned horses. Eighty-nine percent (93/105) of these acted as both the primary carer and owner of the horse(s). Eleven percent (12/105) of our respondents were simply caring for the horse and were not responsible for financial transactions relating to the animal. Only the 105 respondents that currently or have previously owned horses were asked to answer background questions relating to riding discipline, breed owned, income status, and past experiences with tendon injuries.

The most popular riding discipline was pleasure riding (28%; 29/105). Show jumping, racing, trotting, and other (campdrafting and mounted games) were represented least, with sporting, eventing, and dressage ranking intermediately in our demographic (Fig. 1A). Thoroughbreds were the most commonly owned breed (33%; 34/105), followed by stock horses (19%; 20/105), other (16%; 17/105), Quarter Horses (10%; 11/105), Warmbloods (10%; 11/105), Arabian (7%; 7/105), and Standardbreds (5%; 5/105) (Fig. 1B). Eighty-seven percent (91/105) of the horse-owning respondents reported that their horses were not a source of income (data not shown).

3.2. Respondents' Past Experiences With Tendon Injuries

When asked if their own, or horses in their care, had suffered a tendon injury in the past, 41% (43/105) of respondents reported that they had some experience, with 3% (3/105) reporting they had dealt with many (more than three) tendon injuries in the past. The remaining 56% (59/105) reported that they had no experience with tendon injuries (Fig. 2A). Of the 44% (46/105) of respondents that

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