In horses with osteoarthritis, is mesenchymal stem cell therapy more effective at managing lameness than intra-articular corticosteroids?

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This Knowledge Summary aims to determine whether mesenchymal stem cell products are more effective at managing lameness associated with osteoarthritis compared to intra-articular corticosteroids. Osteoarthritis is one of the most common causes of lameness and reduced athletic function in both sports and leisure horses, affecting up to 25% of horses in their lifetime. There are now two mesenchymal stem cell products licensed in the UK for mild to moderate recurrent lameness associated with osteoarthritis in the horse. Mesenchymal stem cell products are thought to have regenerative properties within the joint compared to symptom-relieving properties of traditional intra-articular corticosteroids. Even though there are no papers that directly compare stem cell products to intra-articular corticosteroid, a total of nine publications were critically appraised with two randomized controlled trials and seven experimental trials. In the experimental trials, osteoarthritis was artificially induced, either surgically or medically. The main limitation of these is that artificially induced osteoarthritis does not resemble naturally occurring osteoarthritis. Therefore experimental evidence cannot be fully extrapolated to naturally occurring osteoarthritis in the population. Furthermore, no studies sufficiently followed up the study populations for longer periods and therefore only short term effects of these treatments can be interpreted. The quality of evidence for corticosteroids is weak to moderate in strength, based on the study type, as they were all experimental trials published over 20 years ago. There were four publications studying the efficacy of intraarticular corticosteroids, the main limitation of these was that they were, small study population sizes and lack of power calculations. Meaning study populations were not likely to be representative of the general population. Furthermore, these studies only follow the horses for a maximum of 10 weeks. Three of the four studies showed that treatment with intraarticular corticosteroid in the carpal joint statistically and clinically led to lower lameness scores compared to the control group. Frisbie et al. (1997) and Kawcak et al. (1998) used intra-articular triamcinolone effect night, whereas Frisbie et al. (1998) used intra-articular methylprednisolone acetate.

There is moderate quality evidence for mesenchymal stem cell therapy. Evidence was made up of recent publications, including three experimental trials and two randomized controlled double-blinded trials. In a randomized control trial by Broeckx et al. (2019)b , 47% of the treatment group had returned to their previous level of work at one year compared to 0% of the control group, showing a likely clinical, as well as statistical, significance. However, the one year follow up was completed by owner questionnaire, which is likely to be biased and unreliable compared to a lameness examination. Another limitation was that there was no objective measure of lameness used. In an experimental study by Broeckx et al. (2019)a, a lameness locator was used to compare a group treated with mesenchymal stem cells, the control group. There was reporting bias because no vectors in data is shown for parts of the lameness examination that would have exacerbated lameness on the treated limb. This study did show a

statistically lower lameness score in the treatment group compared to the control. However, the objective measures found no statistical significance on the straight line or lunge.

In conclusion, in horses with mild to moderate lameness associated with osteoarthritis, there is moderate evidence to suggest that mesenchymal stem cell therapies are effective at managing lameness in the short term, but it remains undetermined whether they are more efficacious than intra-articular corticosteroids overall.