



Is inhaled immunotherapy more effective than environmental management when treating equine asthma?

Amy Leather

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Equine asthma syndrome is commonly diagnosed among the population of horses in the UK. Most treatments recommended involve the use of inhaled corticosteroids, altering management to minimize allergen exposure, or a combination of the two. There is the need for an alternative treatment for equine asthma syndrome in the instances where corticosteroids may be contraindicated or where it is not possible to maintain appropriate environmental modifications.

The aim of this Knowledge Summary is to determine if inhaled immunotherapy or environmental modification is more effective in disease modification of equine asthma. There are currently no studies with a direct comparison relevant to the PICO. So, studies comparing immunotherapy or environmental modification to an alternative treatment were included. Following a literature search, 12 papers were identified and critically appraised, five papers investigated the use of inhaled CPG immunomodulators in horses with asthma using placebos corticosteroids, or varying doses of CPG as the comparators. Outcomes measured included bronchoscopy, BAL fluid analysis, clinical exam scoring, arterial blood gas analysis and pulmonary function tests.

Four studies found inhaled CPG to improve the clinical signs of asthma and a significant improvement in clinical score was found following treatment with CPG compared to Beclomethasone inhalation. Two studies investigated the effects of CPG on immunomodulation. CPG significantly reduced the expression of matrix metalloproteinases, tissue inhibitors of metalloproteinases and interleukins in tracheal wash fluid. The authors, Barton et al., suggest it indicates CPG may be able to prevent the formation of pulmonary fibrosis and modify the disease course of equine asthma. In these studies, horses were only assessed up to eight weeks after the treatment period. And so, none is able to determine the long-term effect of inhaled immunotherapy, but together they provide mild evidence supporting the use of inhaled immunotherapy as a treatment for equine asthma.

The remaining seven papers were included as they investigated the effect of environmental modification on horses with equine asthma, it was found that outdoor turnout with no access to hay improved lung function and clinical signs, and at 12 months of environmental management resulted in a significant improvement in the airway, smooth muscle mass of asthmatic courses. However, evidence was also found to show that environmental management alone is insufficient to permanently alter the disease course of asthma. One paper found after six years of outdoor management with no access to hay, a group of asthmatic horses still have reduced pulmonary function compared to age-matched healthy horses. Another study showed contact with hay brought asthmatic horses out of remission. The papers

reviewed in this Knowledge Summary all had limitations. The management of horses was heterogeneous within the immunotherapy studies, making it difficult to assess the effect of treatment.

All of the studies had low populations with no details given on power calculations. Some studies lacked control groups and the immunotherapy papers share many of the same authors with no publications available from a separate research group, which may create author bias. In conclusion, there is low level evidence to support the use of inhaled immunotherapy alongside environmental modification as a treatment for equine asthma. The long-term effect of immunotherapy is yet to be assessed, but these papers find it to be effective for up to eight weeks. Following a treatment period. There is also the need for further research into the effect of immunotherapy when environmental factors, including housing, bedding and forage are controlled in order to determine if immunotherapy can be recommended as a sole treatment for equine asthma.

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