

Rogerson, Susan J. 2013. "The Milk Fat, Double Cream, as an Effective Anti-inflammatory in the Treatment of Acute Laminitis – 2 Case Studies." Open Science Repository Veterinary Medicine Online (open-access): e70081971. doi:10.7392/openaccess.70081971. <http://www.open-science-repository.com/the-milk-fat-double-cream-as-an-effective-anti-inflammatory-in-the-treatment-of-acute-laminitis.html>.

The milk fat, double cream, as an effective anti-inflammatory in the treatment of acute laminitis – 2 case studies

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Abstract

Equine laminitis is a complex and potentially fatal metabolic disease and the number of cases has risen dramatically within the last two decades. Research has shown that the laminitic inflammatory response involves elevated levels of prostaglandin E₂, leukotriene B₄, and thromboxane. Standard treatment with phenylbutazone is not always effective and can worsen the condition. One horse and one pony with acute laminitis were fed up to 3-5 tablespoons double cream mixed into a bran mash for between 5 days and 2 weeks. After 5 days the horse was sound at walk with only a slight near-fore limp at trot. He was turned out to grass and a few weeks later was completely sound. After 5 days the pony was walking more comfortably and her feet were cold. However, mild lameness persisted due to undiagnosed Cushing's disease. This was treated with Pergolide and the pony became sound. This study indicates that the milk fat, double cream, is an effective anti-inflammatory in the treatment of acute laminitis, and could offer a safe, natural alternative to current drug-based therapies.

Keywords: Laminitis, double cream, anti-inflammatory, prostaglandin E₂, leukotriene B₄, thromboxane.

Background

Equine laminitis is a complex and potentially fatal metabolic disease which can result in crippling lameness. The number of horses affected has risen dramatically within the last two decades.

Research has shown that the laminitic inflammatory response involves elevated levels of prostaglandin E₂ (PGE₂), leukotriene B₄ (LTB₄), and thromboxane (TX) ^[1, 2].

Standard treatment with phenylbutazone (bute) and cryotherapy, coupled with a restricted diet, is not always effective in reducing the inflammatory response, and in some instances can worsen the condition.

The purpose of this study is to investigate whether the milk fat, double cream, would work as an effective anti-inflammatory in acute laminitis cases.

Method

Case A - 16.2 h Irish sports horse gelding, 15 years old at start of study. Living out on grass, hay, carrots and broad spectrum vitamin and mineral supplement. Nervous disposition (possibly due to abuse). Slightly footsore (unshod) before purchase in 2000. Became sound after shoeing. Suspected borderline laminitic. Unshod at onset of laminitic episodes.

First Episode

In April 2004 the horse presented with acute laminitis (Obel grade III). He was stabled on woodchips and fed dry bran with added vitamin and mineral supplement once a day. Initially, 3 tablespoons (tbsp) of double cream were added to the feed. This was increased to 5 tbsp per day over 2 days and fed for 2 weeks in total. Hay was fed ad-lib. The horse was kept in for the first day then turned out for a short period daily. After 2 weeks the horse was turned out to grass.

Second Episode

In June 2004 the horse suffered a second laminitic episode (Obel grade II/III). He was fed dry bran with added vitamin/mineral supplement and 5 tbsp double cream 1 x daily for 5 days plus ad-lib hay, but was left out in the field.

Third Episode

April 2012. The horse – now 23 years old – was being fed on Dengie Alpha-A and Allen & Page Calm & Condition, in addition to grass, hay and carrots. He presented with acute laminitis (Obel grade IV), caused by a combination of spring grass and accidental carbohydrate overload. Normal feed was stopped. He was stabled on woodchips and fed a damp bran mash with 5 tbsp double cream 1 x daily for 5 days. No vitamin/mineral supplement was added. Hay was fed ad-lib and the horse was turned out for 1 hour daily, increasing to 3 hours plus from the fourth day. After 1 week the horse was turned out to grass and normal feed ration was gradually re-introduced.

Fourth Episode

In January 2013 the horse presented with mild laminitis (Obel grade II) after being stabled for 5 days due to severe weather conditions and given normal feed rations (due to age and condition). He also had a severely swollen sheath.

Dengie Alpha-A was stopped. He was fed a damp bran mash with 5 tbsp double cream 1 x daily plus A & P Calm & Condition at half the normal ration for the first 2 days, increasing to $\frac{3}{4}$ normal ration thereafter. Hay was fed ad-lib. Turnout was occasional, weather permitting, for no more than $\frac{1}{2}$ hour per day. The horse was bedded on barley straw. The double cream was continued for 2 weeks until the horse could be turned out regularly.

Case B - 11 hands Welsh Section A mare, 21 years old. One known previous laminitic attack.

On 26th May 2012 the pony presented with acute laminitis (Obel grade IV). She was brought in and bedded on wheat straw. She was given no hay but had access to a salt lick. She was given 1 bute plus 1ml Sedolin by her owner. On 27th May she was given 1 bute. On 28th May bute was discontinued and the pony was started on a bran mash with 1 tbsp double cream 1 x daily. The cream was increased to 2 tbsp on the fourth day, then 3 tbsp on the fifth day, and continued at that dosage for a further 3 days. After 8 days the cream was stopped and the pony was continued on bran and Topstraw chaff with access to a salt lick. In the absence of hay she ate her straw bed. Once able to walk she was led out to graze for short periods daily.

Results

Case A

First Episode

After 24 hours the horse was slightly more comfortable. Over the next 3 days walking improved steadily and by day 5 he was sound at walk with just a slight near-fore limp noticeable at trot. However, there were side-effects. The horse suffered mild tympanitic colic approximately 1 hour after bran feed, during which time he would be recumbent and show signs of discomfort. This lasted approximately 4 hours, after which he would release trapped intestinal gas, rise and eat his hay with no further discomfort. He also had fluid retention, increased thirst – drinking twice his normal amount of water, and increased urination. The cream appeared to have a calming effect on his nerves, but after a week he started to appear dreamy and then became increasingly sleepy. There seemed to be no further improvement in lameness after 5 days and after 2 weeks the treatment was stopped. Drinking and urination normalized, fluid was no longer retained and colic symptoms stopped. The horse became more alert and energetic. He was turned out to grass and over the next 3 weeks became completely sound.

Second Episode

After 24 hours walking had improved. There was a continued steady improvement over the next 3 days and by day 5 the horse was sound at walk. Apart from slight discomfort from trapped intestinal gas there were no side-effects. The horse became completely sound approximately 3 weeks later. He remained sound for the next 8 years.

Third Episode

After 24 hours walking had improved slightly. The rate of improvement increased significantly over the next 3 days and by day 5 the horse was sound at walk, with just a slight near-fore limp noticeable at trot. He became completely sound approximately 2 weeks later. There were no side-effects.

Fourth Episode

Improvement was rapid and by day 4 the horse was virtually sound at walk. His swollen sheath had reduced to normal size. There were no side-effects.

Case B

After treatment with bute and Sedolin (administered by owner) the pony was still reluctant to move and spent most of the day recumbent. Respiration was elevated and her feet were hot.

Double cream was started on 28th May. On 29th May (2pm) the pony was up and looking more comfortable. Respiration was normal. The pony was able to walk across the stable slowly and gingerly of her own free will. Over the next 3 days improvement was minimal, but after the cream was increased to 3 tbsp there was an overnight vast improvement. The pony was no longer recumbent during the day and her feet were cold. After 1 week she was able to walk around the yard with only mild discomfort, most marked when turning. There were no side-effects, although the owner noticed increased use of the salt lick.

However, mild lameness persisted over the next few weeks and on some days the pony did not look well. She had not lost her winter coat. A test for equine Cushing's disease (Pituitary pars intermedia dysfunction or PPID) was positive and the pony was prescribed Pergolide by the vet. Several weeks later the pony became sound.

Discussion / Limitations of Study

- 1) This study was carried out over two periods, 8 years apart (Case A). The basic treatment of bran and double cream was the same for each laminitic episode but there were many variables i.e.: age of horse, feeding regime, daily routine and grade of laminitis. However, rate of improvement was similar throughout all four laminitic episodes.
- 2) For Case A, the positive effects of the double cream were seen mostly in the first 5 days, after which it seemed to be of little or no further benefit. However, during the fourth laminitic episode when the horse was mostly confined to his stable and fed near-normal feed rations, continued use may have prevented a further laminitic attack, although this cannot be proved.
- 3) It was observed that at least 3-5 tbsp double cream per day (depending on size of horse or pony) were needed for rapid improvement. At levels below 3 tbsp per day improvement was recorded in respiration, but improvement in lameness was minimal (Case B). Levels above 5 tbsp were not tested.
- 4) The side-effects experienced by Case A are thought to be due to the combination of dry bran and vitamin/mineral supplement. When the supplement was removed and the bran was fed as a mash all side-effects were eliminated.

- 5) Because Case B had secondary laminitis caused by undiagnosed PPID, recovery was only partial. However, once the PPID was treated, complete recovery occurred.
- 6) Before treatment with the double cream, bute and Sedolin were administered to Case B by the owner. It is not known whether or not these drugs affected the results, and if so by how much. This was beyond the control of the author.
- 7) In Case A, the double cream also reduced the inflammation of the horse's sheath, suggesting that it could be used for a range of inflammatory conditions.
- 8) Although it is not scientifically proven that it was the double cream that effected the improvement, it was the only constant in the study other than the bran. In the author's experience, the feeding of bran alone could not account for such a dramatic reduction in the inflammatory response, therefore it is reasonable to conclude that the improvement must be due either to the double cream alone, or to the combination of bran and double cream.
- 9) Proving the exact reason for the anti-inflammatory effect of double cream is beyond the scope of this study. However, a study conducted on Wistar rats which were fed the anhydrous milk fat, ghee ^[3], found that levels of PGE₂, LTB₄, and TX decreased when increased amounts of ghee were included in the diet. It is hypothesized by the author that the double cream had the same or similar effect on the laminitic inflammatory response in the two horses studied.
- 10) Improvement in respiration (Case B) could simply be due to a reduction in inflammation and associated pain. However, it is hypothesized by the author that it might also, in part, be due to the alkaline cream acting as a buffer, thereby ameliorating the symptoms of metabolic acidosis and possible secondary respiratory alkalosis.
- 11) Further studies need to be carried out to determine whether the above hypotheses are correct, but the author does not have the facilities to undertake such studies.
- 12) Further studies also need to be conducted to test the effectiveness of this treatment on other acute laminitis cases, and also to discover whether it could be of benefit in cases of chronic laminitis.
- 13) The Veterinary Declaration states: ".....ABOVE ALL, my constant endeavour will be to ensure the health and welfare of animals committed to my care."
If any vets, scientists or other persons or organizations undertake research based on the above studies and/or hypotheses, it is the author's strong wish that no horse or pony is subjected to experimentally-induced laminitis, nor any other method which causes suffering and/or death, and that no horse or pony is euthanized for the purpose of collecting data. It is the author's firm and deeply held belief that these methods would be completely unnecessary, inhumane, unjustifiable and morally wrong, and the author does not want to be a catalyst for any research practices which bring about such suffering or the death of any animal.

As Hippocrates said: "First, do no harm."

Conclusions

This study indicates that the milk fat, double cream, is an effective anti-inflammatory in the treatment of acute laminitis.

When laminitis is the primary disease, the average time of recovery to soundness at walk is just 5 days, with complete recovery in 3-5 weeks. In cases where PPID has resulted in

secondary laminitis, treatment is highly beneficial, but the underlying cause also needs to be treated before full recovery can occur.

The double cream is thought to function as an anti-inflammatory by reducing levels of PGE₂, LTB₄, and TX.

These conclusions have potentially major implications for the treatment of acute laminitis, which is still on the increase. Current treatment usually consists of bute, cryotherapy and a restricted diet, which is often ineffective and can worsen the condition.

Double cream could offer a safe, natural, cheap and more effective alternative to drug-based therapies, whilst eliminating the need for cryotherapy and prolonged dietary restrictions. It has the potential to provide a new way forward for laminitis treatment and alleviate the suffering of many horses, now and in the future.

Acknowledgements

The author would like to thank Jo Errington for testing the treatment on her pony and recording the results. Thanks also to the staff of Felixstowe Library, Suffolk, England, for their technical help (and patience) as I grappled with the computer. Finally, thank you to everyone at Open Science Repository for the extra help they gave me, which has enabled me to publish my research.

This paper is dedicated to Sparky.

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