



Studies on the management of acute and chronic gastrointestinal sensitivities

Acute and chronic gastrointestinal sensitivities in dogs

The gastrointestinal tract is not only the organ of digestion and absorption. It is also the largest immune organ in the body – as a point of entry for infectious diseases and potential allergy-causing proteins. When healthy gut function is disrupted, animals may suffer a range of debilitating clinical signs that include diarrhoea, vomiting, abdominal cramps, loss of appetite and weight loss.

These symptoms are distressing for animals and frustrating for owners. Treatment may be challenging, expensive and time-consuming. Conventional drug therapies also carry the risk of unpleasant and damaging side effects.

Protexin Veterinary offers a range of products designed to support healthy gut function, helping to alleviate acute and chronic gastrointestinal sensitivities. These products are positioned as a safe and natural alternative to regular treatment, or to complement standard therapies, helping to reduce their period of administration and the likelihood of recurrence of clinical signs.

Protexin is committed to a programme of continuous research and development, and has commissioned independent research that has been central to the growing scientific awareness that probiotics can make an effective contribution to good health. The studies presented here explore the efficacy of a number of products designed to assist in the management of both acute and chronic canine gastrointestinal sensitivities.

Protexin Pro-Kolin+ administration accelerates recovery from acute diarrhoea in dogs

Abstract

Fifty-one dogs took part in a double-blinded, placebo-controlled, multi-centred, randomised study to assess the efficacy of Protexin® Pro-Kolin®+ on the incidence of acute diarrhoea. Pro-Kolin+ contains the EU registered probiotic *Enterococcus faecium* (NCIMB 10415) E1707, Preplex® prebiotic (fructooligosaccharide and gum acacia), kaolin and pectin. Faecal consistency and general activity levels returned to normal twenty-four hours sooner in those dogs receiving Pro-Kolin+ compared to the control group. This trial illustrates the potential value of using Pro-Kolin+ for the management of acute diarrhoea.

Introduction

Acute, non-specific diarrhoea is one of the most common reasons a dog is presented to the veterinary surgeon. With clinical signs ranging from diarrhoea, vomiting, abdominal cramps, inappetence and weight loss, it can be as distressing for the owner as it is for the dog.

The main causes of acute diarrhoea include:

- Changes in diet
- Scavenging / dietary indiscretion
- Gastrointestinal disease such as parasites
- Antibiotic or other drug therapy
- Stress – i.e. through travel, kennelling, post-surgery or weaning.

In many cases the diarrhoea is associated with an intestinal dysbiosis, which is defined as an alteration or imbalance of the intestinal microbiota.

Probiotics are live microorganisms which when consumed in adequate amounts confer a health benefit to the host. Probiotics work by competitive exclusion, by enhancing the intestinal immune system and through the production of lactic acid.

Anti-diarrhoeals such as kaolin and pectin have been used for many years as part of diarrhoea management. Kaolin is recognised for its absorbent abilities and pectin has been shown to have soothing properties.

Pro-Kolin+ is the one of the market leading probiotic products used for the management of acute diarrhoea. The product combines probiotics, Preplex prebiotics, kaolin and pectin in an easy to administer syringe.

Method

The objective of this study was to compare the effect of using Pro-Kolin+ versus a placebo as a treatment for dogs with acute diarrhoea in veterinary practice. The study used the Acute Diarrhoea Activity Index (ADAI) to assess the severity of acute diarrhoea cases. The ADAI is calculated as the sum of the scores within the following four headings:

Activity level	0 = Normal 1 = Slightly reduced 2 = Reduced 3 = Very low
Food intake	0 = Normal 1 = Slightly reduced 2 = Reduced 3 = Very low
Faecal consistency	0 = Normal 1 = Slightly soft 2 = Soft 3 = Very soft 4 = Viscous 5 = Diarrhoea 6 = Watery diarrhoea
Frequency of defaecation	0 = Normal 1 = Slightly increased (2-3 times per day) 2 = Increased (4-5 times per day) 3 = Markedly increased (>5 times daily)

Study Design

The study consisted of a double-blinded, placebo-controlled, multi-centred, randomised trial conducted at veterinary practices within the United Kingdom and Spain. The study consisted of fifty-one dogs (twenty-five in the treatment group and twenty-six in the placebo group).

Inclusion criteria:

- Dogs older than one year of age
- Dogs with acute diarrhoea (this is defined as the presence of at least three diarrhoea-like stools in a period of less than twenty-four hours)
- The duration of diarrhoea must be less than seventy-two hours
- ADAI score of greater than four at the time of inclusion.

Notes

Results

The study showed that faecal consistency returned to normal twenty-four hours quicker in those patients receiving Pro-Kolin⁺ compared to those patients receiving the placebo. In addition, the general activity and feed intake of dogs in the treatment group returned to normal twenty-four hours quicker than the dogs within the placebo group.

It was also found that the treatment group had statistically significant improvements in the ADAI compared to those in the placebo group. The study showed that half of the patients receiving Pro-Kolin⁺ had normal faeces by Day 2 and 70% had recovered by Day 3.

Conclusion

Pro-Kolin⁺ is a safe and effective product for the management of acute diarrhoea. This study shows that dogs receiving Pro-Kolin⁺ recover quicker than dogs administered a placebo.

Efficacy of Protexin Pro-Kolin Enterogenic in dogs with chronic enteropathies: a prospective observational study

Abstract

Twenty-eight dogs took part in this questionnaire-based, retrospective study looking into the clinical outcome of cases of chronic diarrhoea (diarrhoea lasting greater than three weeks) treated with Pro-Kolin® Enterogenic®. Pro-Kolin Enterogenic contains alpha-glucan butyrogenic, MPS Protect, beta-glucans, the EU registered probiotic *Enterococcus faecium* (NCIMB 10415) E1707, Preplex® prebiotic (fructooligosaccharide and gum acacia) and mannanoligosaccharide. Dogs were given Pro-Kolin Enterogenic once daily for thirty days. Those dogs treated with Pro-Kolin Enterogenic showed significant improvement in faecal consistency, defaecation frequency, vomiting and the Canine Inflammatory Bowel Disease Activity Index (CIBDAI). This trial illustrates the value of using Pro-Kolin Enterogenic in cases of chronic diarrhoea.

Introduction

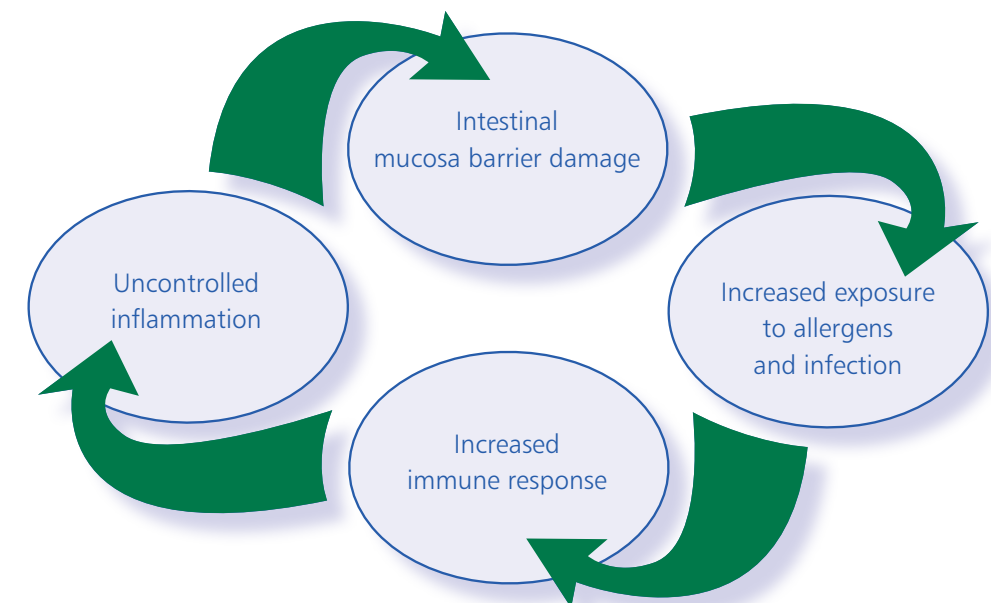
Chronic enteropathies can occur for a variety of reasons, but the underlying cause can be attributed to one or more of the following factors:

- Disruption of the mucosal barrier
- Dysregulation of the immune system
- Disturbances in the intestinal microflora.

In the case of chronic diarrhoea, healthy gastrointestinal tract function is compromised, and long-term management must be implemented to prevent a damaging cycle from becoming established (see illustration, below).

Pro-Kolin Enterogenic aims to manage long-term gastrointestinal sensitivities by reinforcing the mucosal barrier, modulating the intestinal immune system and normalising the microfloral balance.

Pro-Kolin Enterogenic is supplied in a 4g sachet and can be sprinkled onto food. It should be administered for at least 30 days, depending on the severity of the symptoms.



Method

The product was distributed among several veterinary clinics in Spain accompanied by a thorough questionnaire to monitor the clinical signs of dogs suffering with chronic enteropathies. Dogs presenting with chronic diarrhoea (≥ 3 weeks; $n=28$) were included in the study. Fifteen dogs were females and thirteen were males, they were on average eighty-three months old (ranging from 12-198 months), and their averaged body weight (BW) was 15.6kg (range 2.5-31.8kg).

Pro-Kolin Enterogenic was administered orally once a day, for thirty days. Although it is recommended to mix Pro-Kolin Enterogenic with food, some owners ($n=4$) preferred mixing it with water. Dosage changed according to BW, being half a sachet for less than 5kg BW, one sachet for 5-15kg BW, and two sachets for 15-35kg BW dogs. Diets fed to dogs enrolled in this study were strictly maintained and unchanged throughout the whole experimental period (30 days), most of them specific to gastrointestinal conditions.

The current therapy at the moment of inclusion (anti-inflammatory, immunosuppressive or antibiotic drugs) was discontinued from the first day of Pro-Kolin Enterogenic administration ($n=12$) or reduced from Day 15 of therapy ($n=4$). In certain cases, Pro-Kolin Enterogenic was added to the current therapy ($n=12$).

Clinical signs, including general attitude / activity levels, vomiting, weight loss, abdominal pain, faecal consistency, defaecation frequency, borborygmi / flatulence and the presence of blood in faeces were made at Day 0 and again at 15 and 30 days after starting the therapy. All dogs were also evaluated using the CIBDAI scoring system¹ at Day 0, Day 15 and Day 30 of the treatment schedule.

Results

Pro-Kolin Enterogenic administration significantly improved most of the clinical signs shown by dogs suffering from chronic enteropathies (Figure 1). Most of the dogs presenting with frequent or sporadic vomiting at the start of the trial (57% of total, $n=16$) had a significantly reduced frequency of vomiting throughout the 30 days of Pro-Kolin Enterogenic administration (Figure 1B). The percentage of dogs showing chronic and recurrent diarrhoea ranged from 22%, at the start of the trial, to 0% at Day 30 of the treatment. Moreover, the percentage of dogs showing soft faeces decreased from 74% to 59% during the same period of time. Thus, the number of dogs with a normal consistency of faeces was significantly increased from Day 0 to Day 30 of Pro-Kolin Enterogenic treatment (Figure 1C).

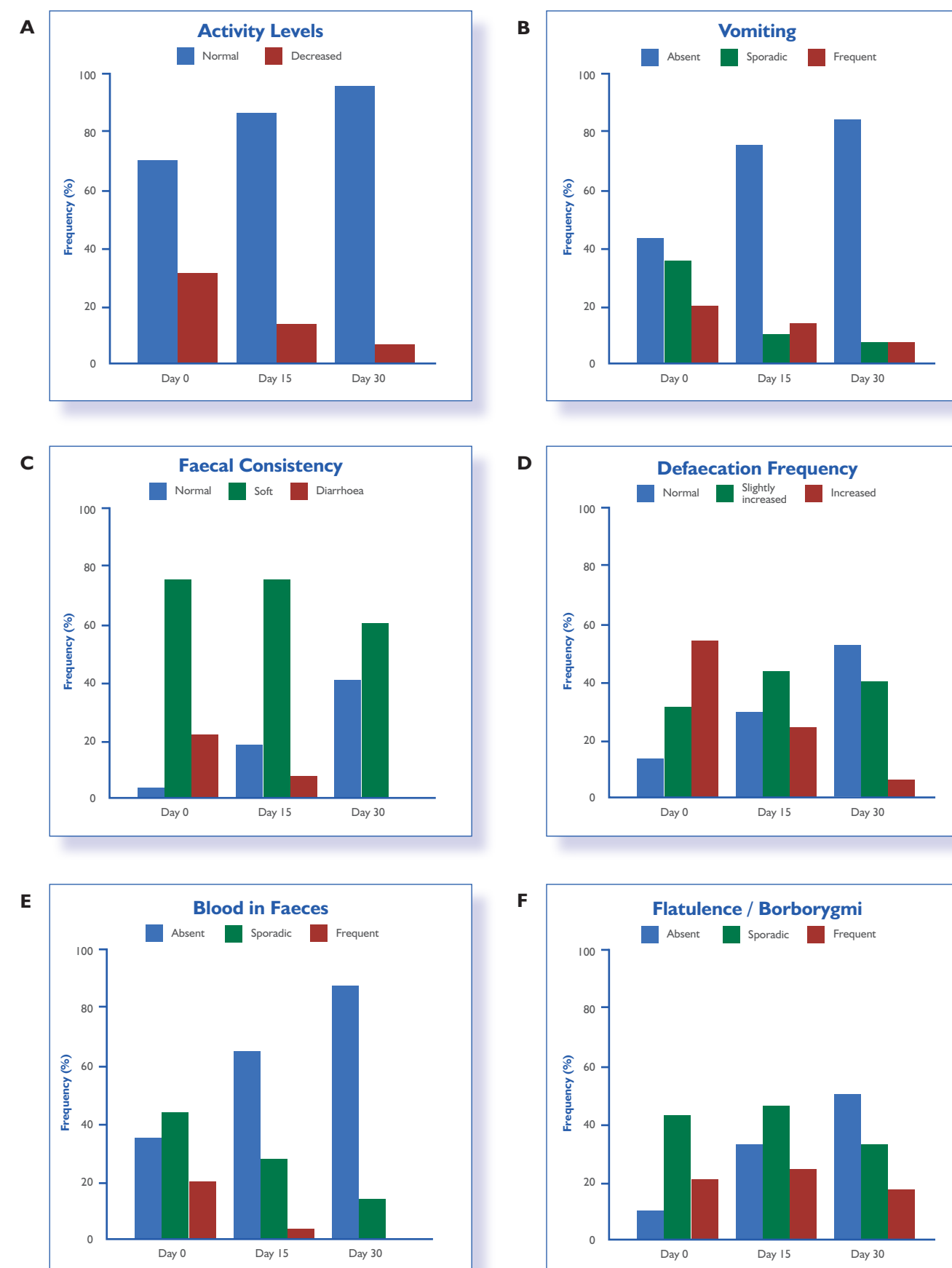
As with faecal consistency, the cases showing an increase in the frequency of defaecation at the start of the trial (54%) were significantly improved by Day 30 of treatment (7%, $p<0.001$; Figure 1D). Thus, the number of dogs showing normal defaecation frequency increased significantly during the study period ($n=4$ at 15 days and $n=11$ at 30 days of treatment). The presence of blood in the faeces was also reduced throughout the therapy period. At the end of the study, there was an absence of bloody faeces in 85% of dogs and the remaining 15% only showed sporadic bloody faeces (Figure 1E).

Borborygmi and flatulence, which are common clinical signs of chronic enteropathies, were present in most of the dogs enrolled in the study (64% of total). Administration of Pro-Kolin Enterogenic helped to reduce the clinical signs in these cases during the 30 day treatment period (Figure 1F). A few dogs (17.8% of total, $n=5$) showed no improvement in the level of borborygmi or flatulence during the whole study period.

The presence of abdominal pain was observed in 38% of dogs ($n=11$) at the start of the trial but decreased to reach 19% at Day 30 of Pro-Kolin Enterogenic administration ($p=0.22$).

Figure 1

Effects of Pro-Kolin Enterogenic administration on activity levels (A), vomiting (B), faecal consistency (C), defaecation frequency (D), blood in faeces (E), and flatulence and borborygmi (F) in dogs suffering from chronic enteropathies.



All dogs were also evaluated using the CIBDAI scoring system proposed by Jergens¹. The number of cases with clinically significant disease decreased from the start of the trial to Day 30 of treatment, and all cases of serious disease resolved by Day 15 of the trial (Table 1 and Figure 2).

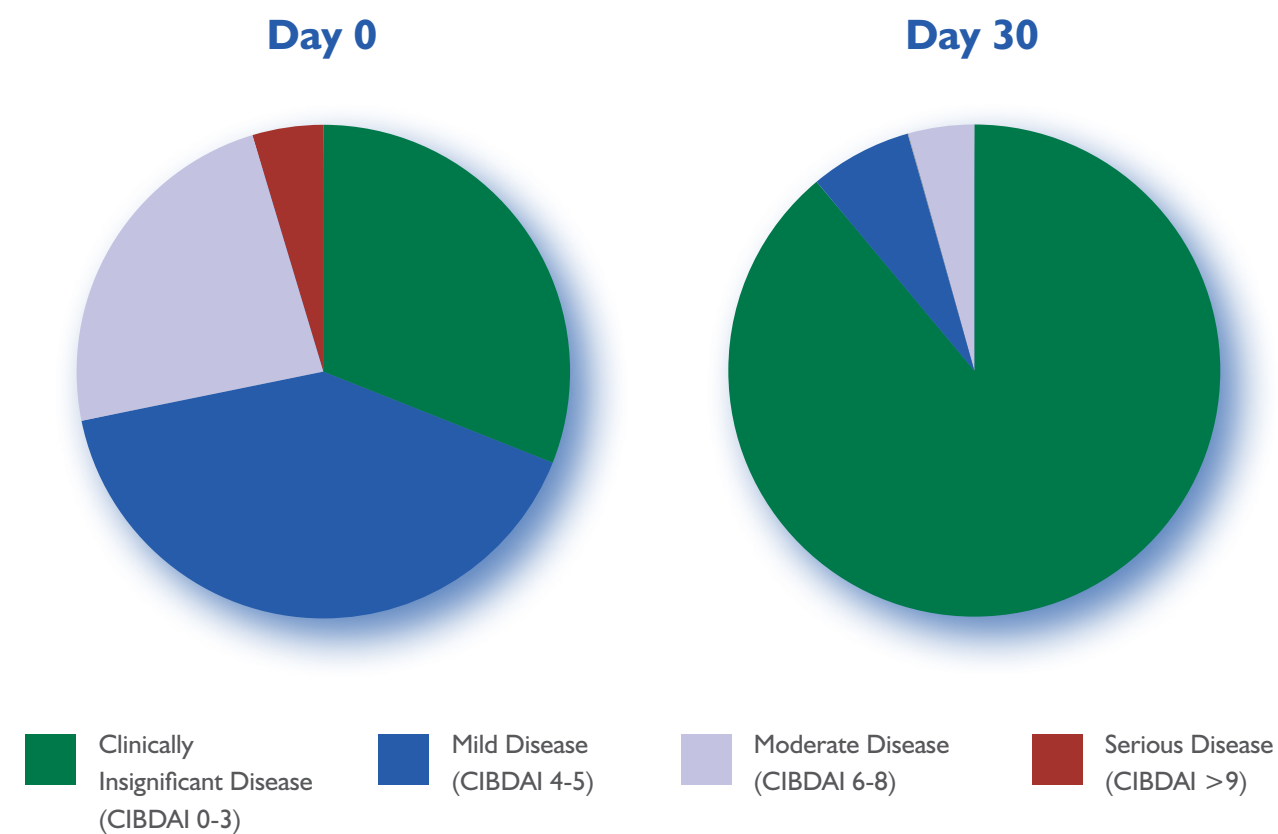
Table I

Classification of studied dogs according to their Canine Inflammatory Bowel Disease Activity Index (CIBDAI) at Day 0, Day 15 and Day 30 of Pro-Kolin Enterogenic administration.

	Clinically Insignificant Disease (CIBDAI: 0-3)	Mild Disease (CIBDAI: 4-5)	Moderate Disease (CIBDAI: 6-8)	Serious Disease (CIBDAI: >9)
Day 0	32.14%	39.29%	25.00%	3.57%
Day 15	78.57%	7.14%	14.29%	0.00%
Day 30	89.29%	7.14%	3.57%	0.00%

Figure 2

The effect of Pro-Kolin Enterogenic on CIBDAI score.



Opinions of dog owners and veterinarians were registered at the end of the study in order to test the acceptability of Pro-Kolin Enterogenic in both populations. Most of the owners and veterinarians had a positive opinion on Pro-Kolin Enterogenic (66% and 71% of total, respectively) or a very positive opinion (19% and 14% of total, respectively). These results were mainly due to the good response to treatment shown in dogs and observed by owners (improvement in faecal consistency, in body weight gain and in activity for example).

Conclusion

Pro-Kolin Enterogenic administration for a 30 day period resulted in an improvement in vomiting and defaecation frequency, faecal consistency and borborygmi or flatulence in dogs suffering from chronic enteropathies.

These results suggest that Pro-Kolin Enterogenic could be a suitable product to help manage chronic enteropathies in dogs, potentially allowing the reduction or even the cessation of other more aggressive treatments used in these chronic diseases (anti-inflammatory, immunosuppressive or antibiotic drugs).

Implications

Pro-Kolin Enterogenic is the first nutritional supplement designed to treat chronic enteropathies in dogs. The positive effects seen in this study, highlight the potential benefit of Pro-Kolin Enterogenic as a tool for reducing the clinical signs caused by chronic enteropathies.

References

- I. Jergens A. 2004. Clinical assessment of disease activity for canine inflammatory bowel disease. *J Am Anim Hosp Assoc.* **40**: 437-445.

Notes

The effect of Protexin Synbiotic on the incidence of diarrhoea in dogs in a canine re-homing centre

Abstract

Eighty-one dogs at the Dogs Trust re-homing centre in Salisbury, United Kingdom, took part in a placebo-controlled, double-blinded and randomised study to assess the efficacy of Protexin® Synbiotic™ on the incidence of diarrhoea within the centre. Protexin Synbiotic contains the EU registered probiotic *Enterococcus faecium* (NCIMB 10415) E1707 and Preplex® prebiotic (fructooligosaccharide and gum acacia). Dogs were given 2×10^9 colony forming units (CFU) daily, from admission to the centre, for a period of six weeks, or until re-homing. The incidence of diarrhoea was significantly lower ($p < 0.05$) in the active group compared to the control group. This trial illustrates the value of using probiotics as a preventative to stress-related diarrhoea.

Introduction

Within the gastrointestinal (GI) tract of animals there are millions of microflora, creating a symbiotic relationship with the host. It is when an imbalance (dysbiosis) occurs that gut disturbances are seen. The normal intestinal microflora plays a crucial role in the host's defence against pathogens as demonstrated by their ability to modulate both innate and acquired immunity at the local as well as systemic levels¹.

Probiotics are defined as "live microbial supplements that beneficially affect the host animal by improving its intestinal balance"², or "live microorganisms which when administered in adequate amounts confer a health benefit on the host"³.

Many factors can cause an imbalance in the gut microflora: a change of diet, the use of antibiotics, stress and disease to name a few. Stress reduces the number of *Lactobacillus* spp. within the gut microflora and increases the number of pathogenic bacteria such as *E. coli* and *Pseudomonas* spp.⁴.

Prebiotics are also of benefit to the host and are defined as "a non-digestible food ingredient that beneficially affects the host by selectively stimulating the growth and / or activity of one or a limited number of bacteria in the colon to improve host health"⁵.

Synbiotic formulations consist of probiotics and prebiotics together, which in combination can improve the longevity of the probiotic by providing a substrate which can be used immediately.

Method

This placebo-controlled, double-blinded and randomised study was designed to evaluate the efficacy of Protexin Synbiotic as a preventative to digestive upsets that commonly occur in canine re-homing centres. The trial ran over a fourteen week period.

Dogs already resident at the re-homing centre were randomly assigned to Group A or Group B using a randomisation table. New dogs entering the centre were randomly assigned to either group on the day of entry. All newly admitted dogs were given a veterinary examination within forty-eight hours of arrival at the centre. The veterinary history of the dog was also recorded along with age, breed and sex of the dog. The average age of the dogs in the trial was four years and the dogs were of varying breed types. Information from the centre indicated that the average residency time for each dog is 3.5 weeks before being re-homed.

Dogs were given either active product at a concentration of 2×10^9 CFU once daily, in accordance with the manufacturers feeding guidelines, or placebo, for up to six weeks, with their morning meal. Faecal grading was carried out twice daily on a scale of 1 to 4.

The scale was a modified and simplified version of the clinical scoring indexes which have been used in canine chronic enteropathies^{6,7}. A grade of 1 represented watery diarrhoea, 2 represented soft to pasty diarrhoea, 3 represented normal faeces and 4 represented hard faeces.

Exclusion criteria included antibiotic usage throughout the trial period or removal from the trial at the request of the Dogs Trust Veterinarian or staff due to medical reasons.

Results

A total of eighty-nine dogs took part in the trial. Eight dogs were subsequently excluded as they required antibiotic therapy during the trial. Of the eighty-one dogs which yielded results: forty-one were in the placebo group and forty in the treatment group. There were no reported incidents of adverse reactions.

Faecal grading was analysed twice daily looking at the episodes of diarrhoea, and time to first incidence of diarrhoea. Faecal grading was recorded using a scale of 1 to 4 as detailed above. There was no recording of faeces graded as 4 in any of the trial dogs.

Statistical evaluation was carried out using generalised Wilcoxon and Chi squared tests.

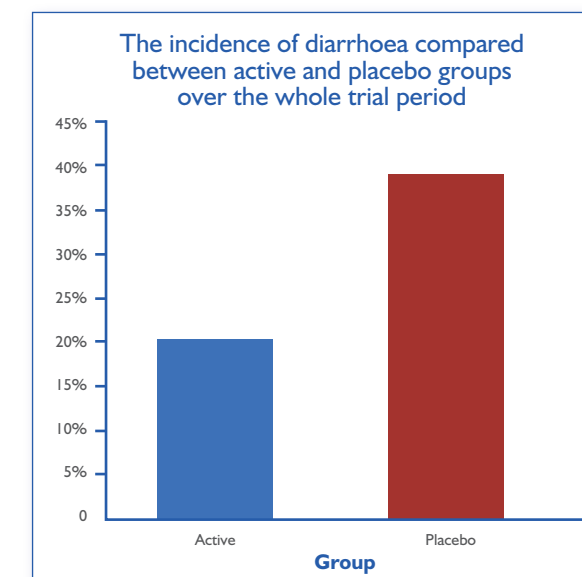


Figure 1

The incidence of diarrhoea was statistically significantly lower in the active (Protexin Synbiotic) group ($p < 0.05$) compared to placebo. Nearly double the number of dogs in the placebo group suffered from an incidence of diarrhoea compared to the active group.

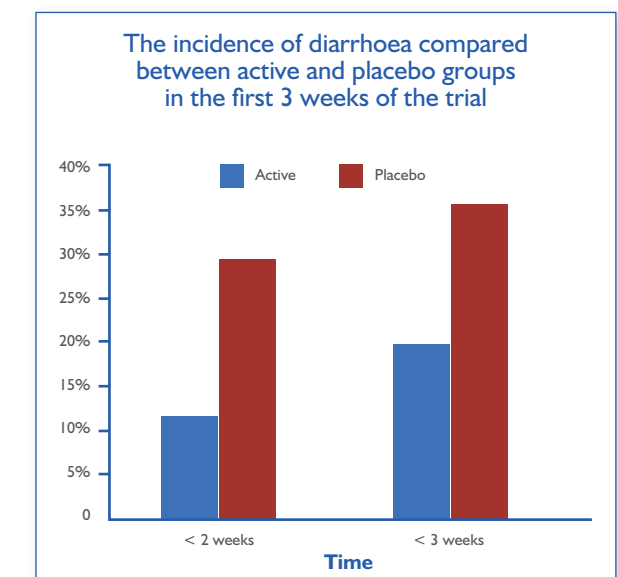


Figure 2

The occurrence of diarrhoea was significantly higher in the placebo group between weeks 0-3 ($p < 0.05$). Dogs in the placebo group were more likely to suffer from diarrhoea within the first 3 weeks of being enrolled in the centre, compared to the active group.

Conclusion

These results support the theory of using probiotics for prevention against stress-related diarrhoea. To the author's knowledge, this is the first study of its kind looking at the benefits of probiotics to reduce the incidence diarrhoea in dogs at re-homing centres. Further studies are needed looking at the prophylactic use of probiotics in expected times of stress.

Acknowledgements

Probiotics International Ltd. would like to thank Salisbury Dogs Trust management and staff for their commitment to this trial.

References

1. Cobra J. 1999. Influence of microbiota on intestinal immune system development. *Am J Clin Nutr.* **69**:1046-1051.
2. Fuller R. 1992. *Probiotics – The Scientific Basis*. Chapman & Hall, London.
3. World Health Organisation. 2001. *Consultation of Health and Nutritional properties of powdered milk with Live Lactic Acid Bacteria*. [online]. [September 2008]. Available from: <ftp://ftp.fao.org/docrep/fao/meeting/009/y6398e.pdf>
4. Lutgendorff F, Akkermans LM, Soderholm JD. 2008. The role of microbiota and probiotics in stress-induced gastro-intestinal damage. *Curr Mol Med.* **8**(4): 282-298.
5. Gibson GR, Roberfroid MB. 1995. Dietary modulation of the human colonic microbiota: introducing the concept of prebiotics. *J Nutr.* **125**:1401-1412.
6. Jergens AE. 2004. Clinical assessment of disease activity for canine inflammatory bowel disease. *J Am Anim Hosp Assoc.* **40**(6):437-445.
7. Allenspach K, Wieland B, Grone A, Gaschen F. 2007. Chronic enteropathies in dogs: evaluation of risk factors for negative outcome. *J Vet Intern Med.* **21**(4):700-708.

Pro-Kolin⁺

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