Fecal Microbiota Transplantation (FMT) For Management of Canine Atopic Dermatitis: Optimization of Fecal Storage Conditions

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BACKGROUND

- The prevalence of allergic disease has increased profoundly in the last 30 years, with strong evidence of correlations between altered gut colonization patterns and reduced gut microbial diversity. Studies have characterized differences in the skin microbiome between allergic and healthy dogs, and shown that different compositions of gut microbiota significantly impact the risk of developing allergic disease.

- Current methods to treat atopic dermatitis are limited by time, expense, and efficacy. The use of FMT is an emerging therapy that holds tremendous promise for restoring intestinal microbiota in affected people and animals, and provide a more cost effective, safe, and effective treatment compared to current therapeutic modalities.

- Preparation and storage of feces is variable and may affect efficacy of FMT at the clinical and molecular level. Studies have shown improved fecal bacterial DNA preservation with freezing and use of various buffers. A study combining temperature and buffer solutions may elucidate optimal fecal storage conditions for use in FMT, laboratory fecal studies, and field biology.

OBJECTIVES

1. To determine optimal storage conditions for fecal microbial DNA preservation
2. To evaluate the efficacy and role of FMT in clinical resolution of pruritus in dogs with atopic dermatitis
3. To assess the role of FMT in modulation of skin and intestinal microbiome

MATERIALS AND METHODS

(1) Determine optimal storage conditions for fecal microbial DNA preservation

(2) To evaluate the efficacy and role of FMT in clinical resolution of pruritus in dogs with atopic dermatitis

(3) To assess the role of FMT in modulation of skin and intestinal microbiome

RESULTS

- Gut microbiome analysis in human and animal health has become increasingly studied with recent technological advances, but there is little consensus on the optimal preservation method of fecal DNA. Our study showed that 70% ethanol yielded the highest DNA concentration, while RNA later yielded the lowest concentration compared to buffers across all temperatures.

- The complex microbial community in the skin and gut is critical to health and development of allergic disease. Ongoing work in the clinical trial, FMT, and microbial analysis will provide insight on the role of the intestinal microbiota in dysbiosis and efficacy of microbial therapy in human and veterinary medicine.

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References: