Fakulta agrobiologie, potravinových a přírodních zdrojů

DOKTORSKÝ STUDIJNÍ PROGRAM/*DOCTORAL STUDY PROGRAM*

VYPSÁNÍ TÉMATU/*LISTING OF TOPIC*

Studijní program/*Study Program*: **Vědy o zvířatech**

Katedra/*Department of*: **veterinárních disciplin**

Školitel, email/*Supervisor, emai*l: **prof. MVDr. David Modrý, Ph.D.**

Konzultant, email/*Co-supervisor, email*: **MVDr. Martina Načeradská, Ph.D.**

Forma studia/*Form of Study*: **kombinovaná**

Téma/*Topic*: Therapeutic Efficacy of Autologous Mesenchymal Stromal Cells and its impact on inflammatory conditions and oral microbiome in cats with Feline Chronic Gingivostomatitis

Hypotézy/*Hypotheses*:

- Mesenchymal Stromal Cells (MSC) therapy could be the effective and long-term solution in treatment of cats with Feline Chronic Gingivostomatitis (FCGS) show minimal or no improvement after full mouth extraction
- MSC therapy will help reduce the gum and systemic inflammation in FCGS
- MSC therapy will improve the microbial dysbiosis in oral microbiome in cats. The increased abundance of pathogenic bacteria will reduce and shift in higher abundance of beneficial microbes
- Evaluation of Serum amyloid A (SAA) as a useful clinical, prognostic and therapy response marker in cats with FCGS treated with MSC

Anotace/*Summary*:

The PhD thesis is aimed to evaluate the therapeutic effects of autologous adipose-derived stromal cells (adMSC) in FCGS management in cats. FCGS is an inflammatory disease of the oral cavity in cats, often associated with immune-mediated destruction of the tissues, causing pain, inflammation and difficulty eating. The prevalence of FCGS ranges from 0.7 to 12.0 %. The full mouth extraction provides the best long-term results in FCGS treatment. However approximately 20 % to 30 % of cats showing minimal or no improvement after extraction.

MSC therapy could be the effective and long-term solution for these cats. adMSC have the ability to modulate the immune response. In the case of FCGS adMSC could help reduce inflammation by promoting a shift from a pro-inflammatory to an anti-inflammatory environment. adMSC can also differentiate into various cell types, such as osteoblasts, chondrocytes, and fibroblasts and could contribute to tissue repair and regeneration.

In cats Serum amyloid A (SAA) concentration is currently applied clinically as the most sensitive and useful acute phase protein. It is known to be increased in immune-mediated diseases and infections. The SAA concentration measurement could be a useful clinical and prognostic marker in cats with FCGS and could provide supporting evidence of a therapeutic response of adMSC treatment.

The oral microbiome in cats with FCGS plays a significant role in the disease's pathogenesis and progression. The overall results show the microbial dysbiosis is characterized by an overgrowth of pathogenic bacteria and a reduction in beneficial microbes that typically help maintain oral health. To our knowledge there is no such a study to date about the impact of adMSC therapy on the oral microbiome in cats. We are suggesting the improvement of microbial dysbiosis which is described as increased abundance of pathogenic bacteria abundance and reduced abundance of beneficial microbes.

This study aims to evaluate whether SAA levels could serve as a useful clinical and prognostic marker in cats with FCGS, and could provide supporting evidence for the therapeutic response to adMSC treatment. The next phase of the study will focus on the effect of adMSC treatment on the oral microbiome in cats with FCGS. Microbial dysbiosis is thought to be one of the key factors in the pathogenesis of FCGS. The experimental part of the study will be conducted in collaboration with clinical veterinarians and cat owners. The overarching goal of the study is to assess this novel therapeutic approach for managing FCGS, with the aim of improving clinical outcomes and enhancing the quality of life for cats with severe FCGS unresponsive to standard treatments.

V/*In* Praze dne/*Date*: 26.01.2025

Podpis školitele/*Signature of the Supervisor*:

Podpis konzultanta/ *Signature of the Co-supervisor*:

Podpis vedoucího katedry/*Signature of the Head of the Department*:

Příloha/*Attachement*: Finanční plán u témat vypsaných pro prezenční formu studia/*Financial plan for topics listed for full-time study*