Efficacy of GcMAF in Treating Feline Immunodeficiency Virus in a Cat: a Case Report

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Abstract— **A male cat was diagnosed of FIV infection. After inefficacious antibiotics therapy, the owner treated the cat with Gc Macrophage Activating Factor (GcMAF), a protein responsible to induce macropaghe activation. After five weeks of treatment, the cat showed strong signs of improvement. As novel information, we indicate the possible use of GcMAF in FIV management..**

Keywords— **feline immunodeficiency virus,Gc Macrophage Activating Factor, cat.**

I. INTRODUCTION

Feline immunodeficiency virus (FIV) is a retrovirus of lentivirus subfamily responsible to an acquired immunodeficiency syndrome in cats (commonly known as feline AIDS). This virus infects domestic cats worldwide, the prevalence is increasing from an estimated 11% to the latest 15% [1,2].

Infected cats can show no evident symptoms for several years, although the virus is able to replicate and destroy the immune system [3]. A latent and progressive decline in immune functions is present, leading to the development of clinical symptoms.

The mortality due to direct viral effects is generally low, however, as infected cats undergo to increased susceptibility to opportunistic infections, mortality rate can be high.

By a cellular point of view, FIV is able to deplete the CD4+ T lymphocytes, as well as CD8+ lymphocytes, B lymphocytes, monocytes and macrophages, strongly affecting the immune system [4].

FIV is currently indicated as an incurable disease. Common prescribed therapeutical treatments for this immune-deficiency syndrome are: antibiotics to treat eventual secondary infections and, with a discretionary point of view from the caregiver, vitamins and natural drugs to increase the immune system responses.

Gc Macrophage Activating Factor (GcMAF) is a protein responsible for macrophage activation [5]. It has been demonstrated its role in treating autistic patients [6], and an in vitro study has demonstrated its involvement on macrophagic cell activation [7].

This case report shows the efficacy of GcMAF treatment in a case of FIV-infected cat.

II. CASE DESCRIPTION

A male domestic cat (*Feliscatus*), 5 years old, was diagnosed with FIV from a veterinary doctor. The cat, named Tigro, showed blood inside the mouth, saliva dripped continuously from the mouth. He had stopped eating and could not even lick the fur to keep clean (fig. 1,B-C). The cat underwent to prescribed antibiotic therapy, without success. The owner has an autistic son currently treated with GcMAF. So, she tried to use GcMAF also on her cat to treat FIV. The cat was treated with 100 ng of GcMAF in 0.05 ml, by inter-scapular injection, once per week for five weeks. After treatment, Tigro showed substantial signs of improvement (fig. 1,D-E). He now eats and licks normally, and his health seems to be almost the same of before the disease (fig. 1,A), as certified by a veterinary doctor. GcMAF was purchased by Immuno Biotech (St. Peter Port, Guernsey, UK).

III. DISCUSSION

We report here a remarkable and significant improvement after GcMAF treatment in a FIV-infected male domestic cat. This is the first observation on the use and efficacy of GcMAF to treat FIV. As case report, we only show our results to stimulate further research, also by a molecular point of view, on the possible use of this bio-molecule in FIV treatment.

GcMAF is a protein involved in regulating immune system. Early studies demonstrated anti-cancer effects of GcMAF [8]. The GcMAFtumor killing activity is due through the activation of macrophages [9]. Indeed, GcMAF-activated macrophages recognize abnormalities on the tumor cell surface, triggering tumor cell death.

Very interesting, in viral diseases, it has been demonstrated that GcMAF was effective as immunotherapeutic drug in Human Immunodeficiency Virus (HIV)-infected patients [10] HIV-infected cells show increased activity of alpha-N-acetylgalactosaminidase (Nagalase) [10], an enzyme responsible for catalyzing the deglycosylation of the GcMAF-

precursor Gc protein (also known as vitamin D3 binding protein) [7]. DeglycosylatedGc protein is incapable of being converted to the GcMAF. In this way, macrophagic cells of HIV-infected patients cannot be activated, leading to immunosuppression. GcMAF treatment was able to enhance immune response against infected cells through macrophage re-activation [10].

It is noteworthy to consider that FIV is closely related to HIV. Indeed, FIV is considered as model to study HIV [11,12]. Both these lentiviruses shares genomic organization, lymphocyte destruction, induction of immunodeficiency and way of growing inside the host. Even if not well clarified, Nagalase-like enzyme could be present also in FIV [13] indicating that this way of action may be the same.

IV. CONCLUSIONS

This case report shows the efficacy of GcMAF treatment in a FIV-infected cat. More and stronger research is needed to further confirm and clarify this result, as well as the cellular and molecular mechanisms of action. We would like to suggest and to stimulate further studies on this topic.

Conflict of interest

Authors declare they have no conflicts of interest.

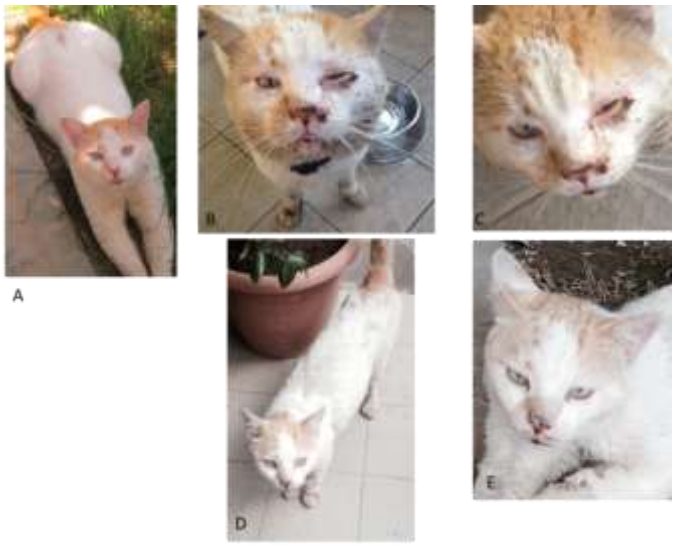

Fig. 1 The male cat object of this case report. 1A before being infected from FIV. 1B-C infected from FIV. 1 D-E after GcMAF treatment.

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