

Decision of Diagnostic Criteria of Feline Obesity Disease

Abstract of Doctoral Thesis

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Obesity is one of the most widespread social problems facing our society health problem. The incidence of obesity in dogs and cats has increased. Prevention of obesity is very important for the health maintenance of dogs and cats. In this study, we settled the diagnostic criteria for obesity disease for cats based on visceral fat accumulation investigated by computed tomography (CT) images and biochemical markers.

In this study, we developed the criteria for determining feline obesity based on computed tomography (CT) images and biochemical markers, and discussed the veterinary medical system to promote the prevention of feline obesity based on the criteria.

We investigated body condition scores (BCS) of clinically healthy dogs and cats, which went to the hospital for health examination at two animal hospitals in Tokyo metropolitan for the past three years. Over 40% of cats were diagnosed as overweight or obese, and its proportion was higher than that of dogs. In obese individuals, excessively accumulated visceral fat secretes free fatty acids (FFA) and some inflammatory cytokines and induces chronic systemic inflammatory. These changes are called lipotoxicity. Similar changes seem to be induced in obese cats, and visceral fat accumulation should be studied.

We divided examinee cats into three groups with different BCS values, BCS 5, BCS 6~7, and BCS 8~9, and measured their plasma metabolites and hormone concentrations, and mass and distribution of subcutaneous and visceral fat (visceral fat /subcutaneous fat ratio, VS ratio) by computed tomography (CT). Plasma triglyceride and FFA concentrations increased accompanying the increase of BCS, adiponectin concentrations were changed among three groups. Plasma SAA concentrations increased with visceral fat accumulation, but BCS did not always reflect changes in the mass of visceral fat.

Simple obesity is not always classified as a disease. JASSO defined pathological obesity which needed medical treatment as 'obesity disease'. Feline obesity should be classified into simple and pathological obesity referring to the criteria for human medicine. Pathological obesity is further divided into with and without visceral fat accumulation. And obesity disease may be diagnosed if overweight cats with BCS >7/9 show two or

more of the following, low adiponectin, hypertriglyceridemia, and high SAA values. Obesity disease cats according to these criteria showed significantly higher plasma triglyceride and SAA concentrations and lower adiponectin concentrations than the control (ideal weight) cats. These criteria may be useful for the detection of the early stage of inflammation and prevention of the progress of obesity disease.

Obesity is categorized as chronic systemic inflammation induced by aberrant secretion of inflammatory cytokines from increased visceral fat accumulation. Settlement of appropriate diagnostic markers at each stage of obesity is needed to suppress obesity disease. The new criteria for feline obesity disease proposed by our present research may be a useful tool for progressing preventive medicine for dogs and cats.