Aspects morphological and morphometric liver and rats submited spleen the diet protein a swine meat, shrimp and casein

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Abstract

Introduction: Various cultures treating certain foods such as remosos, among which are the pig and shrimp are able to stimulate the proliferation of immune cells, which leads to exacerbation of inflammation, tissue damage. Objective: This study evaluated the performance of diets shrimp base, pork and casein in histomorphology hepatic and splenic tissue in an experimental model using Wistar rats. Material and Methods: For this we used male Wistar rats were divided into two groups: control nutritional group (fed Presence diet), protein nutritional group (fed diets swine meat, shrimp and casein), which received its corresponding diet for 30 days, then were euthanized and removed from the liver and spleen for morphologic and morphometric analysis. Results: The results showed that the protein nutritional group was observed the presence of a reasonable amount of fat, featuring moderate steatosis. Regarding the morphometric study of spleen lymphoid follicles showed no statistical difference when comparing their diets. Conclusion: The study showed that in the groups treated with different Hypercaloric protein diets were able to cause damage to liver tissue causing frames of hepatic steatosis.

Keywords: Diets, Shrimp, Pig, Fatty liver, Inflammation.

Introduction

According to popular culture, some foods are called remosos, or unfit for human consumption in certain physiological or pathological states of the organism to have the ability to interfere with the healing process, causing tissue damage or cause exacerbation of acute inflammation (COSTA NETO, 2000; BRITO-JUNIOR and ESTÁCIO, 2013). Some diseases may be caused by the presence of different substances in foods such as rich hypercaloric diet high in saturated fats that are capable of altering histophysiology liver causing nonalcoholic fatty liver disease (NAFLD) (Adams et al., 2005) characterized by the abnormal accumulation of triglycerides in hepatocytes (steatosis) (MARQUEZ, et al, 2006; BRUNA et al, 2013.). Given the complexity of the different diets adopted by individuals or populations of different cultures present study aimed to evaluate the possible influence of different protein diets of animal origin such as shrimp and pork on liver histomorphology. Because of the scarcity and literary evidence of the effects of food on remosos weakened body, it is relevant to an assessment of histopathological effects in the liver and spleen.

Material and Methods

The diets were prepared using a protein concentration of 12% proposed by Reeves et al, 1993. The diet based on casein (CAS) was prepared according to the recommended values for the AIN-93M. For the shrimp-based diet (CAM) was used Netuno® peeled shrimp and headless. For pork diet (SUI) was used Frimesa® pork tenderloin. 40 male Wistar rats were used, with 150 days (Presence diet), protein nutritional group (diets swine meat, shrimp and casein). The animals were individually housed in polypropylene cages, exposed to light and dark cycle at a temperature of 22 ± 2 °C with free access to water and received 30 days of their respective diet. Then the animals were euthanized (with the anesthetic association), to remove the liver and spleen, which were submitted to histological routine and stained with hematoxylin-eosin. For the splenic tissue was performed a morphometric study of lymphoid follicles by measuring area of these follicles using TCI-Pro® software and OPTIMASTM 6.1, to obtain area measurements in cm2 (magnification 200x) of lymphoid follicles, by analyzing four random fields per slide. The measurements obtained were subjected to statistical analysis using the ANOVA test and Tukey, p <0.05, using SPSS software.

Results

Histopathologic analysis of liver and animal nutritional control group fed a commercial diet Presence (PRES) were normal parenchymal and perportal spaces were fully preserved. In protein nutrition group, the animals fed the diet based
on casein (CAS), we observed the presence of a moderate amount of fat in hepatocytes, as the animals that received the diet shrimp base (CAM) and Pork (SUI), they observed the presence of fat in the whole liver tissue featuring a hepatic steatosis type macro and microvesicular, but no presence of inflammatory cells at the site. Regarding the splenic tissue was grossly and histologically preserved in all experimental groups compared to the morphometric analysis. By comparing the averages of lymphoid follicles in the spleen was found that casein diets, shrimp and pig (mean = 51,1cm²; 52,8cm²; 55,1cm² respectively) exhibited statistically similar average size while the Presence diet had a mean (average = 67,4cm²) in size of lymphoid follicles significantly higher than the other diets.

Discussion and Conclusion
Several animal models have shown that provided substances in food, such as, diets high in saturated fat may cause damage to liver tissue due to the increase in free fatty acids and their metabolites which are hepatotoxic leading to steatosis frames that are able to induce a response, changing both its histology as normal operation (BRITO-JUNIOR; ESTACIO, 2013; Michael et al, 2015.). Observed after the 30-day period that SUI diets, CAM or CAS, being diets rich in lipids, showed steatosis ranging from moderate to severe, when compared with the PRES diet, corroborating some studies also evaluated the performance of calorie diets and showed the presence of steatosis in liver of Wistar male rats were fed such diet for more than four weeks, in which this abnormal fat accumulation was directly proportional to the amount of saturated fats and the longer the treatment time with diet rich in saturated fat, can lead to fibrosis frames in tissue (ISHIMOTO et al., 2013). Regarding the morphometric study of the spleen where this type of analysis of the lymphoid organs is essential to the statement of defense mechanisms and to highlight the amendments thereto when the human or animal body is exposed to foreign agents (MELO-JR et al. 2001; MARIORBITO et al 2005). According to the results obtained in this study, spleen, there was no change in the lymphoid follicles, indicating that the use of these diets showing that did not stimulate a defense response able to change the area of the lymphoid tissues caused by immune cells recruitment. These findings suggest that these diets because they are high in fat increase the accumulation of fatty acids in the liver, causing fatty liver damaging the tissue.

References