Introduction and objective: Leukocyte recruitment to adipose tissue is involved in several pathological conditions such as obesity [1]. We have shown that in the context of food allergy there is an increase in the monocyte recruitment to adipose tissue [2]. The aim of this study was to investigate whether prolonged ingestion of antigen by previously sensitized mice would revert the adipose tissue inflammation caused by experimental food allergy. Leukocyte recruitment is a hallmark event of inflammation and happens as a cascade of steps. The leukocytes first roll in the vessels, then adhere to them and it results in the transmigration of leukocytes to the tissue [3].

Methods: Male BALB/c mice were sensitized with Ova in Al(OH)3 on day 0 and received a booster on day 14. The control group (Ova-) wasn’t sensitized with Ova. After day 21 all animals received an Ova diet for 7 (Ova+ 7 days) or 14 days (Ova+ 14 days) (n=8).

Results: The allergic process, that happened after 7 days of Ova ingestion by sensitized mice, was evidenced by a significant increase in the anti-Ova IgE level measured by ELISA. This process resulted in a significant body weight and adipose tissue loss that had the peak 7 days after the challenge with progressive recovery after this day. This loss was followed by a decrease in the area of adipocytes and an increase in the level of cytokines involved in the cellular recruitment such as IL-6 (Fig. 1A) and TNF-alfa (Fig. 1B) in the adipose tissue. Also in this tissue there was an increase in the leukocyte recruitment, rolling cells (Fig. 2A) and adhesion events (Fig. 2B) in the microvasculature of the adipose tissue, visualized by intravital microscopy. After 14 days of oral challenge, sensitized mice showed an anti-Ova IgE level similar to the mice that were only sensitized. With this developed desensitization to Ova all parameters analyzed were significantly improved although they did not reach the basal levels.

Conclusion: Our data suggest that the continued ingestion of Ova by sensitized mice leads to a desensitization to this antigen with a reduction in the leukocyte recruitment to adipose tissue caused by experimental food allergy.

References:

Acknowledgement: Financially supported by CAPES, CNPq and FAPEMIG.
Fig. 1: Kinetics of IL-6 (A) and TNF-α (B) production in epididymal adipose tissue in non-sensitized or sensitized after Ova challenge. Data are reported as means ± SEM for six mice in each group. * P < 0.05 compared to Ova - group and # P < 0.05 compared to Ova + after 7 days of Ova consumption.

Fig. 2: Intravital microscopy was used to assess the rolling (A) and adhesion (B) of leukocytes in microvasculature of epididymal adipose tissue in vivo. Data are reported as means ± SEM for six mice in each group. * P < 0.05 compared to Ova - group and # P < 0.05 compared to Ova + after 7 days of Ova consumption.