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Effect of high fat diet and moderate exercise on T-lymphocytes of Peyer's patches mice

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Moderate physical exercise alone has a positive influence on the immune system[(1)] but the effect of a high fat diet (↑LIPIDS)[(2)] combined with moderate physical exercise in young people has not been established; the objective of this study was to assess whether a high fat diet and moderate physical exercise modifies the T-lymphocyte (TLc) population of Peyer's patches (PP) of young Balb/c mice. Thirty-two 21-d-old male mice were divided into four groups, two groups swam for 30 min, 5 d per week during 9 weeks (E groups) and two groups were left without exercise; one of the exercise and one without exercise were fed a standard diet (CONTROL) and the other two groups were fed a high fat diet (↑LIPIDS) (DIO Rodent Purified Diet, Cat. 58V8; energy: 3.78 kcal/g (15.81552 kJ/d)). Small intestines were dissected, PP were cut, macerated, filtered and centrifuged to obtain the lymphocyte pellet, cells were stained with anti-CD3+, CD4+ and CD8+ antibodies. The diet only increased the weight of mice who made exercise (25.7, SD 0.0) compared with non-exercise group (21.5, SD 2.8) and the control group (20.2, SD 1.4), $P<0.005$. CD3+ TLc (25.6, SD 1.0), CD3+/CD4+ (20.8, SD 1.3) and CD3+/CD8+ (2.62, SD 0.3) decreased significantly in the group ↑LIPIDS/E (in comparison with CONTROL/E: 38.8, SD 2.5, t 13.87; 33.5, SD 2.0, *t* 15.01; 4.93, SD 0.5, *t* 10.96, respectively), $P \leq 0.001$. Thus, the diet did not change the weight of the animals but significantly altered the amount of T-cells, this probably due to the high content of saturated fat in the diet (2.91% from soya oil; 20.69% from lard) (Fig. 1).

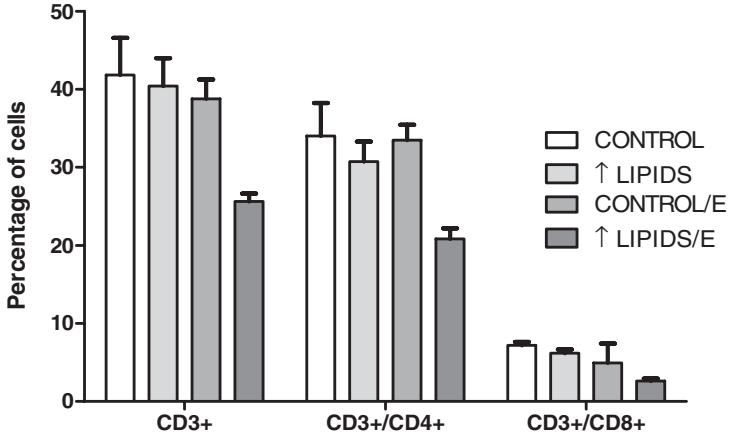

Fig. 1. Percentage of lymphocytes CD3+, CD3+/CD4+ and CD3+/CD8+ from PP of Balb/c mice, feeding with standard diet (CONTROL) or high fat diet (↑LIPIDS); with 30 min exercise (/E), or without it. Values are show in means (SD) (*n* 8), differences were statistically significant by Student's *t* test at $P \leq 0.001$. CONTROL: group with standard diet without exercise; ↑LIPIDS: group with high fat diet; CONTROL/E: group with standard diet with exercise; ↑LIPIDS/E: group feeding with high fat diet and with exercise.

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1. Pedersen BK & Hoffman-Goetz L (2000) *Physiol Rev* **80**, 1055–1081.
2. Kaminogawa S & Nanno M (2004) *Altern Med* **1**, 241–250.