

Background/Aims: It is known that the number of microorganisms in the intestinal tract ranging from 10^{13} - 10^{14} has a function in many metabolic events such as the synthesis of carbohydrates, amino acids and vitamins and this makes intestinal microbiology the center of attention. Menaquinones (vitamin K2) are synthesized in the gastrointestinal mucosa, particularly Bacteroides, Enterobacter, Veillonella, and Eubacterium lentum. Fat-soluble vitamin K is critical for healthy bone development, as well as its role in coagulation. Few studies in recent years have shown that cardiovascular exercises such as jogging, ski cross, cycling, aerobic exercise or swimming cause changes in body homeostasis and thus alter microbiotic content. In this study, we investigated the effect of exercise on vitamin K2 synthesized by intestinal bacteria in ski crossers before and after two weeks of intensive exercise.

Materials and Methods: A total of 31 ski crosser (15 female/16 male) with a mean age of 22 (21-23) years were included. Vitamin K2 levels were measured by high performance liquid chromatography (Shimadzu Corporation, Kyoto, Japan). Wilcoxon sign rank test was used for comparisons. $p < 0.05$ was considered statistically significant. The analyses were performed with NCSS 11 (Number Cruncher Statistical System, 2017 Statistical Software).

Results: There was a statistically significant difference between vitamin K2 levels before and after exercise ($p = 0.001$). The median vitamin K2 level of 12.17 (6.68-23.29) mcg/mL after exercise was found higher than the level of before exercise [4.35 (3.02-8.08) mcg/mL].

Conclusion: Cardiovascular exercise results in electrolyte changes, increased oxidative stress, intestinal permeability, muscle damage and increased systemic inflammatory response. Intestinal microbiota content may vary when trying to adapt to body changes. Exercise and microbiology studies in humans are limited. In a study performed in rats was shown that Lactobacillus, Bifidobacterium, Blautia, Eubacterium genus increased while Clostridium and Enterococcus bacteria decreased. In our study, it was shown that the level of vitamin K2 increased in ski crosser after exercise and this is thought to be achieved by regulating the intestinal microbiota and changing the bacterial content.

Keywords: Ski Cross, vitamin K2, exercise

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Early gastrointestinal effects of lipopolysaccharide-induced sepsis in a rat model

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Background/Aims: Sepsis is an important clinical problem, not yet solved in our society. Mortality is high, particularly if accompanied by septic shock. The aim of this research was to characterize the early gastrointestinal effects of sepsis associated with lipopolysaccharide (LPS) administration in an animal model.

Materials and Methods: Adult male Wistar rats received an intraperitoneal injection of LPS (5 mg/kg) or saline (0.9% NaCl, 1 mL/kg). Different parameters were evaluated: bedding intake (as a marker of nausea in non-vomiting animals) and water ingestion for 2 hours (experiment A); colonic sensitivity to mechanical stimulation (experiment B); colonic motility in organ bath (experiment C). Weight and size of the stomach and caecum, and consistency of small intestinal contents were also determined at sacrifice.

Results: Compared with control animals, rats treated with LPS increased bedding and water intake for 1 and 2 hours, respectively (experiment A). Colonic sensitivity to mechanical stimulation was not modified by LPS at 2-3 hours after administration (experiment B). In experiment C, the most outstanding effects of LPS were a decrease in frequency and an increase in the colonic peak pressure associated with peristaltic contractions. At sacrifice (around 3.5 hours after administration), stomach and caecum weights were higher in LPS-treated than in control animals. The small intestinal contents were mostly liquid in LPS-treated rats.

Conclusion: Our results suggest that nausea and thirst are early signs of sepsis, associated with water accumulation within the gastrointestinal tract (stomach, small intestine and caecum) and alterations in colonic motor activity. In contrast, changes in colonic