RESUMO

Introduction: Vegan diets, may have long-term positive health impact, reducing obesity and ischemic heart disease prevalence in general population. In this context, even considering that, when appropriately planned, vegan diets are appropriate for individuals during all stages of the life cycle, it is well know that, vitamin B-12 deficiency leads to elevated plasma homocysteine concentrations (hyperhomocysteinaemia), a risk factor for neurological disorders and cardio-vascular problems. Since stroke mortality has not been shown to differ between vegetarians and non-vegetarians, and, that the formers, mainly vegans, have high hyperhomocysteinaemia prevalence with eventual vascular endothelium adverse effects, mainly related to B-12 vitamin and creatine indisponibility in their daily diets, considering that creatine supplementation is able to reduce plasma homocysteine levels and enhance vascular reactivity in the microcirculation, it is reasonable to investigate the impact of this procedure in vegans individuals. The present study intends to investigate, in strict vegans with and with out hyperhomocysteinaemia, the effects of creatine supplementation at the systemic microcirculation and homocysteine blood levels. Materials and Methods: Endothelium-dependent microvascular reactivity was evaluated in the forearm skin of vegans volunteers using laser speckle contrast imaging coupled with cutaneous acetylcholine (ACh) iontophoresis and post-occlusive reactive hyperemia (PORH). Functional capillary density was assessed using high-resolution, intra-vital color microscopy in the dorsum of the middle phalanx. Capillary recruitment (capillary reserve) was evaluated using PORH. Microcirculatory tests were performed before and after a 3-wk (5g/day) micronized creatine monohydrate supplementation (CrS) with 99% purity (Bioderm, Rio de janeiro, Brasil). Results: After 3-week creatine supplementation, there was an increase in total body mass (66.1 ± 10.3 vs. 67 ± 10.5 kg, p<0.05), body mass index (23.3 ± 3.4 vs. 23.6 ± 3.5 kg/m2, p<0.05), creatinine (0.71 ± 0.08 vs 0.91 ± 0.19, p = 0.0001) and folic acid levels (13.3 ± 5.7 x 15.8 ± 6.6, p <0.05). Only CrS, but not Pla [10.58 (8,15-13,22) x 11,23 (8,46-13,32) μmol/L; p = 0,5169], significantly reduces homocysteine plasma levels [12,11 (8,57-17,12) x 10,58 (8,15-13,22) μmol/L; p = 0,0199]. Although it did not have a significant effect on normohomocysteinemic vegans, CrS reduced the homocysteine levels of hyperhomocysteinemic vegans by 39% (22,1 ± 16, 1 μmol/L x 13,4 ± 5,3 μmol/L, p = 0.0007). Vegans functional capillary density (basal capillary density) was significantly increased after 3-week of CrS (136 ± 8 x 147 ± 13 capillaries/mm2; p = 0.0001), but not in placebo group. An increase in capillary recruitment during post-occlusive reactive hyperemia (141 ± 9 vs 155 ± 14 capillaries/mm2; p = 0,0001) was also observed only in CrS group. After 3 weeks of CrS, hyperhomocysteinemic vegans, had a significantly higher vasodilation response to ACh infusions in relation to normohomocysteinemic individuals, as represented in área under de curve analysis (4435 ± 3463 x 8605 ± 4127 APU/s, p= 0,0050). Conclusions: The present study demonstrated that three weeks of creatine supplementation are sufficient to increase the perfusion response of capillaries and elevate those of folic acid between normal and hyperhomocysteinemic vegans, and to reduce homocysteine levels only among hyperhomocysteinemic

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