Effects of Dietary Supplements on Simulated Arterial Plaque

Dellinger, Esme (School: Tavares High School)

Atherosclerosis causes millions of deaths worldwide and no known medications dissolve the plaques that build up inside arteries. Some proponents of alternative medicine claim that B-complex vitamins and the amino acid arginine will dissolve arterial plaque. However, there is very little evidence or research on these methods. Plaques were simulated by adding cholesterol and calcium phosphate to hydrogels based on the methods of Razzi et al. (2022). The plaques were dehydrated, then soaked in simulated blood plasma in one of three treatment groups: simulated blood plasma only, simulated blood plasma containing B-complex vitamins, and simulated blood plasma with arginine. They were soaked in the solutions for 4 days, then dehydrated again. The mass was compared before and after the treatments. The plaques in the control group lost an average of 17.1% of their mass, those in B-complex vitamins lost 13.5%, and those in arginine lost 23.4%. A one-way analysis of variance indicated that the mean change in mass differed among the three groups ($p = 0.02$). T-tests showed that the plaques in arginine decreased more than the control plaques ($p = 0.02$) and more than the plaques in B-complex ($p < 0.01$). The plaques in B-complex did not differ significantly from the control group ($p = 0.13$). These results provide evidence that arginine may be an effective natural treatment for arterial plaques but that vitamin B-complex had no effect.

Awards Won: