Effect of seaweed mixture intake on plasma lipid and antioxidant profile of hyperholesterolaemic rats

Abstract

Cardiovascular disease (CVD) is the leading cause of death in many countries. Hypercholesterolaemia is a recurring risk factor in CVD leading to coronary atherosclerosis, stroke and ischemic heart disease. Previous research has proven that seaweeds are highly nutritious, providing a good source of dietary fibre, minerals, proteins and vitamins as well as being high in antioxidants. Antioxidants have been known to retard low-density lipoprotein (LDL) oxidation to reduce CVD risk in hypercholesterolaemia. However, there is yet to be a study on the effect of a mixture of different seaweed species on cholesterol lowering properties. Therefore, this study was designed to investigate the effects of a mixture of extracts from two seaweed species, red seaweed *Kappaphycus alvarezii* and brown seaweed *Sargassum polycystum* on plasma lipid and antioxidant profiles of rats fed high-cholesterol diet. *S. polycystum* extract significantly decreased plasma cholesterol by 37.52 % over an 8-week treatment period compared to *K. alvarezii* and mixture groups. However, *S. polycystum* showed an increase in plasma triglyceride (TG) levels by 16.66 %. *K. alvarezii* extract most effectively decreased TG levels by 40.11 % and the mixture extract most effectively increased high-density lipoprotein cholesterol by 56.71 %. All treatment groups were able to reduce LDL cholesterol levels compared to the high-cholesterol group, with no significant differences between them. *K. alvarezii* and *S. polycystum* mixture extract had the best atherogenic index, which is an indicator of lipid disorder in coronary diseases, among treatment and high-cholesterol-fed groups. All treatment groups were able to restore enzyme antioxidant levels (superoxide dismutase and catalase) to normal.