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Role of Fish Oil in Preventing Cardiovascular Diseases

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Letter to Editor

Cardiovascular disease is caused by disorders of the heart and blood vessels, and includes coronary heart disease (heart attacks), cerebrovascular disease (stroke), raised blood pressure (hypertension), peripheral artery disease, rheumatic heart disease, congenital heart disease and heart failure. The major causes of cardiovascular disease are tobacco use, physical inactivity, an unhealthy diet and harmful use of alcohol. According to World Health Organization (WHO) there is rising burden of Non-Communicable Diseases (NCD) and burden of NCDs is one of the major challenges of twenty first century. Cardiovascular Diseases (CVDs) are one of the common non-communicable diseases and are number one cause of death globally. According to World WHO an estimated 17.5 million people died from CVDs in 2012, representing 31% of all global deaths. Of these deaths, an estimated 7.4 million were due to coronary heart disease and 6.7 million were due to stroke. Furthermore, 82% of CVD deaths occur in low-and middle-income countries and occur almost equally in men and women. It is estimated that by 2030, almost 23.6 million people will die from CVDs, mainly from heart disease and stroke. These are projected to remain the single leading causes of death. The largest percentage increase in morbidity will occur in the Eastern Mediterranean Region, while largest increase in mortality will occur in the South-East Asia Region [1]. Coronary heart disease burden is projected to rise from around 47 million DALYs (Disability-Adjusted Life Years) globally in 1990 to 82 million DALYs in 2020 [2].

Considering the high burden of CVDs, it is highly important to find out strategies to prevent it. Most cardiovascular diseases can be prevented by addressing behavioral risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol using population-wide strategies. In addition to these strategies, role of fish oil has been highlighted in literature to reduce the burden of CVDs. Epidemiologic studies have showed an inverse relation between fish and fruit and vegetable intake and mortality due to Coronary Artery Disease (CAD). The beneficial effects of fish

oil have been attributed to Eicosapentaenoic Acid (EPA) and Docosahexanoic Acid (DHA), present in fish oil, and to alpha-linolenic acid (the precursor of n-3 long chain fatty acids) and antioxidant vitamins found in vegetables and fruits. Omega-3 fatty acids can protect against thrombosis and arrhythmias, especially ischemia-induced ventricular fibrillation [3]. EPA is the precursor to a group of eicosanoids including series-3 prostaglandins and series-5 leukotrienes. The series-2 prostaglandins and series-4 leukotriene are involved in intense actions (such as accelerating platelet aggregation and enhancing vasoconstriction and the synthesis of inflammatory mediators) in response to physiological stressors. Adequate production of the series-3 prostaglandins, which are derived from the omega-3 fatty acid, EPA, may protect against heart attack and stroke as well as certain inflammatory diseases like arthritis, lupus, and asthma. In addition, animal studies, have demonstrated that omega-3 LC PUFAs (Polyunsaturated Fatty Acids), such as EPA and DHA, engage in multiple cytoprotective activities that may contribute to anti arrhythmic mechanisms. Arrhythmias are thought to be the cause of "sudden death" in heart disease. Studies have reported that omega-3 fatty acids decrease Triglycerides (Tg) and Very Low Density Lipoprotein (VLDL) in hypertriglyceridemic subjects, with a concomitant increase in High Density Lipoprotein (HDL), thus reducing the risk of CVDs [4].

References

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