Healthy Lifestyle, Healthy Diet, Physical Fitness: Cardiometabolic Diseases

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Editorial

As a member of the Editorial Board, it gives me great pleasure to write this Editorial for Series of Cardiology Research on my current research interest *i.e.*, prevention of metabolic diseases. Metabolic diseases are disorders that occur when normal metabolism is disrupted. Having said that, we are not referring here to inherited metabolic disorders. What we are referring in this article are the diseases of lifestyle, which are promoted by altered metabolism leading to oxidative stress, chronic inflammation, excess weight, obesity, endothelial dysfunction, subclinical atherosclerosis, type-2 diabetes, and various vascular diseases.

Cardiometabolic diseases (CMDs), such as hypertension, excess weight, obesity, diabetes (type-2), and vascular diseases are considered lifestyle diseases. In the last three decades, these diseases have reached epidemic proportions worldwide [1]. According to the results of a recent study published in the journal Circulation, adopting five low-risk lifestyle factors may be linked to longer life spans in Americans [2]. Metabolic diseases, which are lifestyle diseases are preventable. Many times I wonder, whether excess disease burden in such an advanced nation as the USA, may be due to the limited focus of the US healthcare system on drug discovery and development, risk factor identification and treatment, rather than prevention. Furthermore, the abundance of unhealthy life choices seems to be the driving force for the increased incidence and prevalence of chronic metabolic diseases. Using the data from two major ongoing studies *i.e.*, the Nurses' Health Study and the Health Professionals Follow-up Study and the National Health and Nutrition Examination Survey (NHANES), the researchers concluded that "Americans could narrow the life-expectancy gap between the USA and other industrialized nations by adopting healthy lifestyle". These investigators from the Departments of Nutrition and Epidemiology, Harvard TH Chan School of Public Health, Boston, Massachusetts, defined the following five low-risk lifestyle factors as the modifiable risk factors for improving longevity: i) never smoking; ii) body mass index of 18.5–24.9 kg/m^2; iii) 30 mins/day of moderate to vigorous physical activity; iv) moderate alcohol intake (5–30 g/day for men and 5–15 g/day for women); v) and a high-quality diet. Based on the data from 34 years follow-up the authors concluded, "Adopting a healthy lifestyle could substantially reduce premature mortality and prolong life expectancy in the US adults". One of the major take home message from this seminal study is that prevention should be a top priority for national health policy and preventive care should be an indispensable part of the US healthcare system.

In a retrospective cohort study, Mandsager and associates investigated the association between cardiorespiratory fitness and long-term mortality. These authors concluded that "Cardiorespiratory fitness is inversely associated with long-term mortality with no observed upper limit of benefit. Extremely high aerobic fitness was associated with the

greatest survival and was associated with benefit in older patients and those with hypertension. Cardiorespiratory fitness is a modifiable indicator of long-term mortality, and health care professionals should encourage patients to achieve high levels of fitness" [3]. In view of the fact, that some recent studies have described adverse effects related to exercise, the report in the Jama Network on the association of lifestyle factors on life expectancies is a welcome news [3, 4]. In a seminal study in 52 countries, representing every inhabited continent, Yusuf and associates from McMaster University, Canada demonstrated the potential benefits of managing modifiable risk factors in reducing premature mortality [6]. Similar to the Jama Network report, INTERHEART study showed that abnormal lipids, smoking, hypertension, diabetes, abdominal obesity, psychosocial factors, consumption of fruits, vegetables, and alcohol and regular physical activity account for most of the risk of myocardial infarction worldwide in both sexes at all ages and all regions [6].

It is of great interest, that a collaborative study by prestigious US and international institutions such as, Center for Human Genetic Research and Cardiology Division, Massachusetts General Hospital; Division of Preventive Medicine, Brigham and Women's Hospital; Program in Medical and Population Genetics, Broad Institute, Cambridge; Department of Clinical Sciences, Lund University, Sweden; The Cardiovascular Institute, Mount Sinai Medical Center, Icahn School of Medicine, Mount Sinai Hospital, New York; Department of Genetics, Perelman School of Medicine, University of Pennsylvania, Philadelphia; University of Texas Health Science Center, Houston, Texas, concluded, "Across four studies involving 55,685 participants, lifestyle factors were independently associated with susceptibility to coronary artery disease [7]. Among participants at high genetic risk, a favorable lifestyle was associated with nearly 50% lower relative risk of coronary disease than was an unfavorable lifestyle. These observations from large clinical studies and their conclusion fits very well with the observations of Prof. Frank Hu, of Harvard TH Chan School of Public Health, indicating that a healthy diet pattern, moderate alcohol consumption, non-smoking status, a normal weight and regular physical activity were each associated with a low risk of premature mortality [2].

In spite of the fact, it has been fairly well established by large clinical studies that robust management of modifiable risks or adherence to a low-risk lifestyle could prevent premature mortality and prolong life expectancy, these observations and recommendations seem to have not made a significant impact in stopping, reversing, reducing or prevention of cardiometabolic diseases worldwide. In this short overview, we are not in a position to provide all the answers to many questions that arise after reading the reports mentioned above. However, we certainly would like to emphasize that prevention should be a top priority for health policies in all the nations. Preventive care should be an indispensable part of all the healthcare systems. Just diagnosis of the risks and management of observed risks will not stop, reverse or reduce the incidence and prevalence of metabolic diseases, which have attained epidemic proportions worldwide. We should educate the population, change their attitude about the management of metabolic diseases. Time for action is now, not tomorrow.

References

1. Rao GHR. Global syndemic of metabolic diseases: Editorial Comments. J Diabetes Clin Res. 2019;1(1):02-04.

2. Li Y, Pan A, Wang DD, et al. Impact of healthy lifestyle factors on life expectancies in the US population. Circulation. 2018;138(4):345-55.

3. Mandsager K, Harb S, Cremer P, et al. Association of cardiorespiratory fitness with long-term mortality among adults undergoing exercise treadmill testing. JAMA Netw Open. 2018;1(6):e183605.

4. Merghani A, Malhotra A, Sharma S. The U-shaped relationship between exercise and cardiac morbidity. Trends Cardiovasc Med. 2016;26(3):232-40.

5. Lee DC, Pate RR, Lavie CJ, et al. Leisure-time running reduces all-cause and cardiovascular mortality risk. J Am Coll Cardiol. 2014;64(5):472-81.

6.   Yusuf S, Hawken S, Ounpuu S, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet. 2004;364(9438):937-52.

7.   Khera AV, Emdin CA, Drake I, et al. Genetic risk, adherence to a healthy lifestyle, and coronary disease. N Engl J Med. 2016;375(24):2349-58.