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Editorial

Diet and Chronic Diseases

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Let food be thy medicine and medicine be thy food

-Hippocrates

Diet, dietary changes and life-style variations that occurred with industrialization, urbanization, economic development and market globalization have accelerated the incidence and mortality rates due to non-communicable diseases such as some type of cancer, cardiovascular diseases (CVD), obesity, diabetes mellitus, hypertension and stroke, etc. This global burden is expected to rise by 57% by 2020. The problem of chronic diseases is cumulating in developing countries and would contribute to 60% of the global burden. Population-based epidemiological evidence has clarified the role of diet in preventing and controlling morbidity and premature mortality resulting from NCDs. Some of the specific dietary components increase the probability of occurrence of these diseases, while some prevent or reduce the risk of these diseases. Inappropriate dietary patterns, decreased physical activities, increased tobacco use are few factors that contribute to diet-related chronic diseases. Vitamins, minerals, fiber, lipids, antioxidants and phytochemicals combat most diseases and aid in creating a balanced and optimum health. Food additives (chemicals, herbicides, pesticides, flavors, colors, etc.) and process-induced chemicals contribute to NCD, majorly through genetic modifications.

Chronic diseases are largely preventable. Hence, beyond appropriate medical treatment, the public health approach of primary prevention is the most cost-effective, affordable and sustainable. Many countries have widely recognized the need to strengthen control and preventive measures to counter the spread of chronic diseases; nevertheless, the developing countries need to catch-up with this trend. Structured and intensive life-style interventions have helped in reducing the risk of diabetes. Dietary behaviors associated with decreased fat intake specifically saturated fat, increased fruit and vegetable, and fiber intake has shown promising results with reduced weight, reduced glycated hemoglobin, reduced blood pressure and cholesterol levels.

Diet-associated physiological and molecular mechanistic contribute towards the health conditions. Conjugated linolenic acid (CLA) modulate the expression of gene coding for enzymes known for macronutrient metabolism. Physical effects of dietary fiber such as appetite regulation, fecal bulking and less contact time, laxative effect, cholesterol lowering and improved glycemic control, drive metabolic health. Gut microbiota convert fiber to short chain fatty acids (SCFAs), and phenolics and biocomponents to other metabolites that are absorbed into the body; thus, influencing signaling molecules and the metabolism at cellular level. Fermentation of these also allows specific changes in the composition and activity of gastrointestinal flora. Micronutrients are essential for optimal physiological and neurological functioning including energy production, DNA/RNA synthesis/repair, genomic and non-genomic methylation and synthesis of signaling molecules.

Gene-diet interaction, gut microbiome and homeostasis are evolving areas of research. The interplay gene and dietary components at molecular level are under active pre-clinical and clinical investigations. Formation of biometabolites such as short chain fatty acids and its role in preventing chronic diseases, is yet another area that needs thorough investigation. Gut health an emerging research area, with its bacterial diversity might be associated with diet and improved health; and would be an interesting area to explore.

Figure: *Dietary components to prevent major non-communicable diseases.*

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