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Editorial

Genome-based nutritional strategies to prevent chronic liver disease



Currently, the world's population is aging because older people are living longer. This fact also places them at risk of living unhealthy more years compared to our ancestors due to non-communicable diseases such as diabetes, cardiovascular diseases, chronic liver diseases and cancer. These unhealthy conditions will soon be accountable for 73% of all deaths and 60% of the global burden of disease by the year 2020 and will mainly occur in the developing countries [1]. However, these diseases can be preventable by assessing the genetic and lifestyle risk factors which include diet, physical activity, and emotional stress.

As for chronic liver diseases, alcoholic liver disease, viral hepatitis, and most recently non-alcoholic fatty liver disease (NAFLD) are challenging the health care systems worldwide. Therefore, novel strategies are warranted to prevent these diseases by identifying and controlling the predisposing factors. One such factor is bad nutrition, a key player involved in the onset and progression of obesity as well as other nutrition-related co-morbidities that lead to liver damage. Thus, nutritional changes could have a favorable impact on liver health. Several studies in distinct countries with traditional food cultures have reported a nutrition transition whereby a shift towards a westernized diet has raised the rate of chronic diseases. Paradoxically, the same studies suggest the use of a Mediterranean-type diet in non-Mediterranean cultures to halt these trends. Although this proposal may be uptaken by some people at a personal level, this strategy is not feasible as a general public health policy in all regions of the world. On the contrary, nutritional changes need to be tailored based on the actual gene-environmental interactions sustained by each regional population [2]. Therefore, in case of Latin America, our Amerindian ancestry is a genetic aspect that needs to be considered as a potential risk factor for chronic diseases among the contemporary admixed populations (mestizos). On the other hand, this region also contains a rich ambient biodiversity and cultural history of staple foods that can undoubtedly be promoted as healthier food choices.

Therefore, in alignment with the worldwide claim that prevention plays a key role to diminish the rising trend of chronic diseases together with the advent of genomic sciences [3], a line of translational research in Genome-based Nutrition for the Prevention of Chronic Liver Disease was developed at the Department of Molecular Biology in Medicine, Civil Hospital of Guadalajara, Fray Antonio Alcalde-University of Guadalajara in Guadalajara, Jalisco, Mexico. Recently, we have described the characteristics of the unhealthy diet consumed by the Mexican population defined as

hepatoprogenic due to the high prevalence of dyslipidemia, insulin resistance and liver inflammation in the form of non-alcoholic steatohepatitis (NASH) [4,5]. We provide strategies to maintain a healthy liver and avoid chronic liver disease. These genome-based strategies take into account three interrelated aspects, (i) the prevalence of the risk alleles of polymorphic genes among the admixed Mexican population related to food preferences, lipid and carbohydrate metabolism, alcohol metabolism, hunger-satiety circuit and brain reward system; (ii) the habitual food items; and (iii) the food culture and dietary habits. These factors are assessed to elaborate a basic and correct Mexican diet tailored by region for each person's nutritional needs and food preferences. In other words, the aim is to restore the balance between the individual's genetic background, the nutrients found in the regional staple foods and the traditional and healthy ways of cooking.

Additionally, we have taken a step forward to adjust this basic Mexican diet with specific modifications for patients with alcoholic liver disease, hepatitis C and NASH, respectively [6,7]. Our experience with these genome-based nutritional strategies is improving the metabolic conditions of liver-diseased patients at early stages and promoting the consumption of traditional, healthy regional dishes that are at risk of being forgotten due to the acculturation process that has occurred in the last 50 years. These strategies intended to reduce the obesity epidemic and the risk of liver damage may be developed in most regions of Latin America and worldwide by searching for the main population's genes that co-evolved with the regional foods and food culture [8–11]. Therefore, each population could develop a regionalized genome-based nutritional strategy inspired by its own local biodiversity as mentioned before.

We recently celebrated the first anniversary of a renovated editorial stage aiming Annals of Hepatology to be the best hepatology journal in the Latin American region [12]. A new Aim and Scope was announced seeking studies in this field of Genome-based Nutrition to combat chronic liver disease. Therefore, the editorial board encourages the scientific and medical communities to submit nutrigenomic studies from populations at risk of chronic liver diseases that establish genome-based nutritional interventions, and at the same time, are contributing to rescue the Latin American heritage of healthy staple food resources and traditional cooking. These nutrigenomic studies are needed to guide the implementation of prevention strategies aimed at maintaining a healthy liver and avoiding liver damage.

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