

The modern way of life is inflammatory!

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A comparison of the metabolism of Tanzanians living in town or in the countryside, published in the prestigious Nature Immunology, shows that urbanization is associated with dietary changes that lead to damaging overactivation of the inflammatory immune system.

Several developing countries are currently experiencing a very rapid transition from their traditional way of life to that typical of western industrialized countries, with in particular a significant migration of the population to the cities (urbanization) which coincides with the abandonment of traditional dietary habits (fruits whole grain, vegetables, tubers and cereals) for a diet mainly based on the consumption of processed industrial foods high in sugar and fat.

Unfortunately, this nutritional transition has catastrophic effects on health: all countries, without exception, which adopt this type of Western diet, have seen a sharp increase in the incidence of obesity in their population as well as of several diseases that were once very rare among them, especially cardiovascular disease, type 2 diabetes and certain types of cancer.

These diseases add to the burden associated with the many infectious diseases that still ravage these countries, creating unsustainable pressures on their health systems.

THE EXEMPLE OF SUB-SAHARAN AFRICA

Sub-Saharan Africa (the set of 48 countries south of the Sahara Desert) is one of those regions of the world that is currently experiencing an unprecedented wave of urbanization and rising incidence of chronic disease.

This rapid transition in the way of life of the inhabitants of these countries therefore gives scientists the opportunity to examine in real time the biochemical impacts associated with urbanization and their contribution to the development of these diseases.

According to the results of a study carried out in one of these sub-Saharan countries, Tanzania, this increase in the incidence of chronic diseases is largely caused by an excessive stimulation of the inflammatory immune system associated with urbanization (1).

Analyzing the blood of 323 Tanzanians who lived either in the town of Moshi (at the foot of Kilimanjaro) or in the countryside, the researchers noted that immune cells in the blood of city dwellers showed a stronger expression of several genes involved in the inflammatory response, especially those associated with the interferon pathway.

Urbanization therefore appears to reprogram circulating immune cells to a more inflammatory phenotype, which can create a climate conducive to the development of several chronic diseases that depend on inflammation to progress.



ANTI-INFLAMMATORY DIET

Participants in rural areas ate a traditional diet rich in whole grain cereals like millet and sorghum, tubers, and fruits and vegetables and had greater amounts of certain anti-inflammatory molecules found in these foods in their blood, in particular the polyphenol apigenin, of plant origin.

Townpeople, on the other hand, consumed more saturated fat and ultra-processed foods, and mostly had increased levels of metabolites involved in cholesterol metabolism.

Further analysis indicates that these differences in metabolites have a measurable impact on the development of an inflammatory climate. For example, when the researchers isolated immune cells from the two groups studied, they noticed that cells in the blood of city dwellers responded much more strongly to inflammatory stimuli than those isolated from the blood of rural residents.

The researchers also showed that the simple act of adding apigenin to the immune cells of city dwellers was enough to block this inflammatory response, which strongly suggests that it is the absence of metabolites from the traditional diet, rich in plants, which is largely responsible for the creation of the inflammatory climate observed in city dwellers.

The modern way of life obviously provides multiple benefits in terms of quality of life, but it is unfortunately often associated with a deterioration in the health of populations. These diseases are linked to the new modern way of life.

It is the excessive industrialization of food that is largely responsible for these harmful effects, in particular the many ultra-processed products overloaded with sugar and fat that promote excess weight and the development of chronic inflammation.

Favoring a more traditional diet, rich in plants that provide protective phytochemical molecules, remains the best way to benefit from the advantages of modernity while minimizing its negative impacts.

- (1) Temba GS et al. Urban living in healthy Tanzanians is associated with an inflammatory status driven by dietary and metabolic changes. *Nat. Immunol.* 2021; 22: 287-300.