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Short Communication

Childhood obesity and overweight in extreme cold climates, myth or reality?

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Introduction

The World Health Organization (WHO) has consistently reported that overweight and obesity are causing a significant weakening in the health of the world's population [1]. Obesity has nearly tripled to date, in 2019 it was estimated that 38.2 million children aged 5-19 years were overweight or obese, being a problem in high, middle and low-income countries, particularly in urban settings, this increase occurred similarly among boys and girls [2]. There is research that in cold environments obesity can develop more easily because this climate influences hormones related to hunger, increasing appetite towards excessive intake and inactivity [3].

In this regard, it has been reported that Eskimos, whose land is located in regions such as Russia, Alaska, northern Canada and Greenland, are more likely to be obese than other populations worldwide [4]. Exposure to cold temperatures generates variations at the hormonal level, with an increase in ghrelin and cortisol, which have been associated with appetite and mechanisms that facilitate lipid storage [5]. Among the coldest and windiest countries in the world are Russia, Canada, the United States (northern regions), Iceland, Finland, Estonia, Norway, Sweden, Denmark, Latvia, France, New Zealand and in southern regions of the Americas, Chile and Argentina [6].

In Chile, There are Two Regions With Extreme Cold Weather Conditions, Which are Closely Reflected in the High Rate of Obesity and Overweight:

a) The Magallanes Region: 27.1% total obesity. Of these, 19.6% have obesity and 7.5% severe obesity. In addition, 63.6% of fifth grade students are overweight or obese.

b) The Aysén Region: 26.6% total obesity. Of these, 18.7% obesity and 7.9% severe obesity [7].

Is Cold Certainly a Direct Predictor of Obesity?

The physiological answer is no, as brown adipose tissue is activated by exposure to cold and generates heat to increase body temperature. This process is triggered by specific receptors (TRPA1) on nerve endings that sense cold. A similar response can be initiated by capsaicin, a natural compound. Based on this fact, the project "Stimulation of energy expenditure and brown adipose tissue in humans" suggested that activation of brown adipose tissue could be considered as a promising strategy to increase energy consumption in humans [8].

So, Why do Cold Climate Regions of the World have so much Obesity?

Although it is correct that in cold weather our body raises its temperature and thus metabolizes fats, one way to do this is by ingesting food, this does not imply that our choices when eating during the cold season should provide an excess of fat and calories to our body; excess that can be translated into weight gain and, what is even worse, in the incorporation of bad eating habits [9].

Busnelli remarked that "many people, once winter arrives, tend to leave salads or fresh fruits aside, because they consider them to be typical of summer and associate them with a refreshing feeling that is not typical of the winter season" [9]. Water is another fundamental nutrient that is often abandoned in the winter, which could put us at risk of dehydration [10]. The fundamental cause of childhood overweight and obesity is the imbalance between caloric intake and caloric expenditure.

The Worldwide Increase in Childhood Overweight and Obesity is Attributable to Several Factors, such as:

a) The global dietary change where there is an increase in the intake of hypercaloric foods with abundant fats and sugars, but with few vitamins, minerals and other healthy micronutrients.

b) The trend of declining physical activity due to the increasing sedentary nature of many recreational activities, changing modes of transportation, and increasing urbanization [11].

In relation to how to approach the treatment of childhood obesity and overweight, there are many interventions with

different proposals, the most effective being those that combined the components of physical activity, nutrition, education and behavioral therapy and that are aimed at children and their parents as participants in the interventions [12].

Conclusion

In conclusion, it is possible to show that overweight and obesity are directly related to extreme cold weather, which is the trigger of a physiological, hormonal and habit change in human beings and especially in children, since they cannot choose the environment in which they live or the food they eat, extreme cold temperatures cause a decrease in physical activity in families as mobility tends to be mostly in private vehicles or public transport, children stop playing in parks or sports fields and stay more time at home doing sedentary activities such as the use of screens and social games without vigorousness. Another fundamental aspect is the change of eating habits, decreasing the intake of water, fruits and vegetables and increasing the intake of hypercaloric and fatty foods.

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