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Influence of AMY1A copy number variations on obesity and other cardiometabolic risk factors: A review of the evidence

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Abstract

The rising incidence of obesity and type 2 diabetes is contributing to the escalating burden of disease globally. These metabolic disorders are closely linked with diet and in particular with carbohydrate consumption; hence, it is important to understand the underlying mechanisms that influence carbohydrate metabolism. Amylase, the enzyme responsible for the digestion of starch, is coded by the genes AMY1A, AMY1B, and AMY1C (salivary amylase) and AMY2A and AMY2B (pancreatic amylase). Previous studies demonstrate wide variations in AMY1A copy numbers, which can be attributed to several genetic, nutritional, and geographical diversities seen in populations globally. Current literature suggests that AMY1A copy number variations are important in obesity and other cardiometabolic disorders through their effects on glucose and lipid homeostasis, inflammatory markers, and the gut microbiome. This review synthesizes the available evidence to improve understanding of the role of AMY1A in obesity and related cardiometabolic risk factors and disorders including insulin resistance and type 2 diabetes, cardiovascular risk and inflammation, and the gut microbiome.

Keywords: AMY1A; amylase; blood pressure; cardiovascular disease; cardiovascular risk factors; gut microbiome; inflammation; lipids; obesity; type 2 diabetes.