Chronic Stress: A Significant Factor in the Development of Type 2 Diabetes

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In the modern context of increasingly prevalent chronic stress and its profound implications on health, coupled with the escalating incidence of type 2 diabetes, there is a need to explore the intricate relationship between diabetes and chronic stress.. This review explores how chronic stress affects glucose control and analyzed how genetics and epigenetics can help limit stress-related type 2 diabetes risk. Research studies have reported that long-term exposure to air pollution is associated with a significant elevation in the risk of developing type 2 diabetes. Our results showed a consistent link between forms of chronic stress and type 2 diabetes. For example, the NCD Risk Factor Collaboration (2016) highlighted that each 10 μg/m³ increase in PM2.5 concentration is associated with a 22% increase in type 2 diabetes prevalence. The presence of chronic stress was seen to disrupt insulin signaling, leading to insulin resistance,a decrease in insulin sensitivity through inflammatory processes, and hypothalamic-pituitary-adrenal (HPA) axis dysregulation.. These findings can be used to form stress management programs, lifestyle interventions, and combined interventions such as mindfulness-based stress reduction and cognitive-behavioral therapy to address the stress levels in patients. By addressing cultural and socioeconomic barriers of limited access to nutritious food, unsafe exercise environments, heightened crime and violence, cultural beliefs and practices, and economic disparities, we can reduce racial and ethnic disparities in type 2 diabetes. In sum, there is a need for effective interventions that limit the adverse effects of chronic stress on glucose metabolism and the formation of type 2 diabetes.