NLRP3 inflammasome: Potential role in obesity related low-grade inflammation and insulin resistance in skeletal muscle

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Abstract
Among multiple mechanisms, low-grade inflammation is critical for the development of insulin resistance as a feature of type 2 diabetes. The nucleotide-binding oligomerization domain-like receptor family (NOD-like) pyrin domain containing 3 (NLRP3) inflammasome has been linked to the development of insulin resistance in various tissues; however, its role in the development of insulin resistance in the skeletal muscle has not been explored in depth. Currently, there is limited evidence that supports the pathological role of NLRP3 inflammasome activation in glucose handling in the skeletal muscle of obese individuals. Here, we have centered our focus on insulin signaling in skeletal muscle, which is the main site of postprandial glucose disposal in humans. We discuss the current evidence showing that the NLRP3 inflammasome disturbs glucose homeostasis. We also review how NLRP3-associated interleukin and its gasdermin D-mediated efflux could affect insulin-dependent intracellular pathways. Finally, we address pharmacological NLRP3 inhibitors that may have a therapeutical use in obesity-related metabolic alterations.

Author keywords
Chronic inflammation
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