

From insulin sensitivity to anti-ageing benefits: a centennial of metformin evidence.

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Abstract

First reported in 1920 and followed by a paucity of reports, metformin's anti-ageing benefits became the focus of a skyrocketing pipeline of research only after 2010. Known to be associated with decreased inflammation, lower cardiovascular event rates and improved cancer outcomes, today's research enterprise surrounding metformin reveals unprecedented clues about its role in the ageing process. The drug is well tolerated, not metabolized and its effects include the inhibition of cholesterol and triglyceride synthesis, stimulation of fatty acid oxidation and systemic increase of insulin sensitivity. Metformin treatment results in phosphorylation and activation of hepatic AMP-activated protein kinase suppressing expression of key lipogenic transcription factors. Recent evidence also indicates a role in gut colonization and inflammation-regulated adipose tissue metabolism, leading to improved senescence. Therefore, owing to its increasing relevance, this review will focus on the role of the most sought after anti-ageing drug in improving insulin resistance, inflammation, as well as cardiovascular and cancer outcomes.