Role of Sirtuins in Diabetes and Age-Related Processes

Background

- Intermittent fasting is a widely adopted diet trend due to its feasibility and reported high success rate.
- Intermittent fasting → state of caloric restriction → ↑ sirtuin proteins (SIRTs).
- 7 isoforms of SIRTs exist in humans with a wide variety of functions.
- SIRTs = class of nicotinamide adenine dinucleotide (NAD) dependent lysine-specific deacetylases and represent homologs of yeast silent information regulator (SIR2).
- Evolving field with SIRT-specific activators are being revealed.

Methods

5 searches in PubMed:
“Sirtuin” and “Diabetes” in title
“Sirtuin” and “Fasting” in title
“Sirtuin” and “Vascular” in title
“Sirtuin” and “Age” in title
“Sirtuin” and “Review” in title
Total = 116 papers

Results

SIRTs appear to have a positive impact on the aging process in part by limiting the negative effects of inflammatory mediators and metabolic stressors. Positive implications of SIRTs in type 2 diabetes mellitus include decreased insulin resistance, maintenance of renal function, and minimal cognitive impairment.

Examples of SIRT Activators:
SRT1720 (1000x increase) & Resveratrol (13x increase) =
prevent cardiovascular disease, protect pancreatic cells, decrease chronic inflammation, and alleviate metabolic syndrome by acting as a free radical scavenger.

Discussion

An evolving understanding of SIRTs remains fundamental in providing potential treatment alternatives against age-related diseases.

7 SIRTs have been described in humans in different locations of the cell with corresponding functions including gene transcription, DNA repair, and protection against oxidative damage.

SIRTs play a controversial role in the progression of cancer as they normally protect against oncogenic transformation, but excessive activity can have potential tumorigenic properties.

Other SIRT activators are found in green tea, turmeric, kale, etc.

References

https://foodinsight.org/2020-food-and-health-survey/
https://perfectketo.com/types-intermittent-fasting/
https://www.nejm.org/doi/full/10.1056/nejmr1905136,