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The emerging role of the epigenetic enzyme Sirtuin-1 and high mobility group box 1 in patients with diabetic foot ulceration

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Diabetic foot ulceration (DFU) is a serious diabetic complication that can progress to amputation and since SIRT1 regulates glucose metabolism, inflammation and oxidative stress which are the major contributors in diabetic complications, So we aimed to discuss its role as an epigenetic biomarker in DFU and highlight its link to oxidative stress and inflammatory cytokines. 60 DM patients were enrolled in the study, 30 without DFU and 30 with DFU in addition to 15 healthy subjects (control group). SIRT1 mRNA relative gene expression was assessed. Catalase activity, advanced glycation end products (AGEs), tumor necrosis factor alpha (TNFα), interleukin 6 (IL-6) and High mobility group Box1(HMGB1) levels were measured. DNA fragmentation was also performed. SIRT1 expression and catalase activity were significantly decreased in diabetic patients compared to control group with the lowest levels in DFU patients, TNF α, IL-6, HMGB 1 and AGEs levels were significantly higher in the diabetic patients compared to control group with the highest levels in DFU patients. DNA fragmentation was more profound in DFU patients.The study revealed that SIRT1 mRNA expression can be considered as a novel biomarker in DFU being a major player involved in its pathogenesis.

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