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Novel role of phytochemical and bioactive compounds in diabetic ulcer/ wound treatment: Current molecular approach

Abstract: Diabetes-related ulcers and slow-healing wounds offer a severe health danger to everyone due to their unknown aetiology. Diabetes foot ulcer (DFU) mortality rates vary from 10% after 16 months to 24% after 5 years. Therefore, using botanical medicines as a therapy technique is one way to address this issue, especially in places where resources are few. The process of repairing injured tissues by substituting malfunctioning wounded cellular components is known as wound healing. Natural materials, phytochemicals, bioactive compounds, and secondary metabolites have been widely utilised for wound care for millennia. Numerous scholarly investigations have examined the potential of natural chemicals in the process of wound healing. The compounds have been categorised in these studies according to their characteristics, bioactivities, and modes of action. However, current study is limited to assessing natural compounds that come from either plants or animals. Macrophages are necessary for tissue repair, the elimination of cell debris, and the lowering of inflammation during wound healing. More research is being done on macrophage activity inside the wound; it may be detrimental if improperly stimulated, as in fibrosis or chronic non-healing wounds. Recent developments in macrophage-specific deletions, in vivo and translational wound models, and methods for differentiating macrophage subsets have shown the wide range of macrophage activation and effector function. To improve wound healing, this research examines organic molecules from plants and animals that target many biological systems. Wound-healing macrophages are triggered by cytokines, apoptotic cells, nucleotides, and mechanical stimulation. Recent study suggests these traits improve wound healing.

Keywords: Diabetic ulcer, phytochemical, miRNA, Nanoparticle, Wound repair