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INNATE IMMUNOLOGICAL MECHANISMS PLAY IMPORTANT ROLES IN WOUND HEALING

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The molecular pathogenesis of chronic wounds is acknowledged to be multifactorial, and often associated with a sustained inflammatory response. The impact of bacteria present in chronic wounds and their perpetuation of local immune responses, though, remains unclear.

Toll-like receptors (TLR) and antibacterial peptides are important participants of the innate immune system. In our study, we investigated wound fluids from chronic venous leg ulcers, comparing healing and non-healing wounds through a period of 8 weeks. We demonstrated a significant decrease in the levels of the antibacterial peptide Lipocalin-2 in healing wounds compared to non-healing wounds. By stimulating transiently transfected Human Embryonic Kidney (HEK) 293 cells we also demonstrated a correlating decrease in TLR-2 and TLR-4 stimulating properties in healing wounds compared to non-healing wounds, and found the TLR-activity to be possibly caused by a resident microbial flora in these wounds.

Further, we investigated innate immune stimulatory properties of six bacterial species cultured from chronic venous leg ulcers: *Staphylococcus aureus*, *Streptococcus* species, *Pseudomonas aeruginosa*, *Citrobacter diversus*, *Peptoniphilus asaccharolyticus* and *Eubacterium lentum*. We measured TNF α inducing properties in monocytes, and TLR-2 and TLR-4 stimulating properties of these bacteria on transiently transfected HEK 293 cells. The results demonstrated new mechanisms of how the chronic bacterial flora may contribute to the chronicity of these wounds by being able to alternate between immune evasion and stimulation of the host innate immune system.

References:

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