Synopsis of Original Research Paper

The role of transcription factor SOX2 in the regulation of cutaneous I/R injury

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Cutaneous ischemia-reperfusion (I/R) injury is engaged with the early pathogenesis of cutaneous pressure ulcers (PUs). Our previous work identified that the induction of genes that were consistently upregulated in the oral mucosa, especially transcription factor *SOX2*, accelerate wound healing in skin. The aim of this study was to investigate the effect of SOX2 on the formation of PUs after cutaneous I/R injury and determine the molecular and cellular mechanisms. We found that induction of SOX2 in the keratinocytes significantly suppress the formation of PUs. The induction of SOX2 in the keratinocytes suppressed the numbers of infiltrating inflammatory cells (MPO^+ neutrophils, $CD68^+$ macrophages) in the skin area after I/R injury. In SOX2 expressing ice, the number of $CD31^+$ endothelial cells was significantly increased, and hypoxic area was significantly decreased when compared with control mice. In SOX2/OKD-48 (Keap1-dependent oxidative stress detector, No 48-luciferate) mice, Nrf2 antioxidant response pathway was significantly enhanced with respect to control OKD-48 mice. *In vitro*, SOX2 expressing keratinocytes significantly decreased the numbers of apoptotic cells under H_2O_2 stimulation. These results suggest that the induction of SOX2 in the keratinocytes might protect against the development of PUs after cutaneous I/R injury by enhancement of anti-oxidative response, resulted in suppression of apoptosis, protection of vascular damages and inhibition of infiltration of inflammatory cells.