Radiotherapy for oral cancer decreases the cutaneous expression of host defence peptides.

Abstract:
Bacterial resistance against antibiotics has become an increasing challenge in the treatment of cutaneous infections. Consequences can be severe, especially in infected wounds following previous local radiotherapy. Certain endogenous peptide antibiotics, the host defence peptides (HDPs), exhibit broad-spectrum antimicrobial activity and promote wound healing. Their use as supplements to conventional antibiotics is a current topic of discussion; however, knowledge of their quantities in healthy and compromised tissue is a prerequisite for such discussion. To date, no data concerning HDP quantities in irradiated skin are available. Expression profiles of the genes encoding HDPs, namely human beta-defensin-1 (DEFB1, hBD-1), beta-defensin-2 (DEFB4A, hBD-2), beta-defensin-3 (DEFB103, hBD-3) and S100A7, were assessed in samples of non-irradiated and irradiated neck. A reduction in the expression of all of the examined genes was observed in irradiated skin when compared with non-irradiated skin (statistically significant in the case of S100A7, \( P = 0.013 \)). Immunohistochemistry revealed differences in HDP distribution with respect to the epithelial layers. The study demonstrates a significant reduction in HDP gene expression in neck skin as a result of radiotherapy.
These findings might represent a starting point for novel treatments of cutaneous infections in irradiated patients, such as topical supplementation of synthetic HDP.