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2997 Expression of Human β -Defensins-1 and -2 in Periodontal Health and Disease

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Human defensins are a group of small cationic cysteine-rich peptides with potent antimicrobial activity against both Gram-positive and Gram-negative bacteria, fungi, and viruses. Their expression has been found in the epithelia of a variety of human tissues such as skin, trachea and gingiva. Objectives: To assess the expression of human β -defensin-1 (hBD-1) and β -defensin-2 (hBD-2) in human gingiva and their relations with periodontal conditions. Methods: Gingival tissue biopsies were collected from 22 patients with advanced chronic periodontitis, including periodontal pocket tissues and the adjacent clinically healthy tissues. Seven gingival biopsies were obtained from 7 periodontally healthy subjects as controls. The expressions of hBD-1 and hBD-2 were detected by immunohistochemistry and quantitatively analyzed with a computerized image processing system. Results: Both defensins were detected in all healthy controls, while hBD-1 was detected in all patients and hBD-2 in most of the patients. The expressions of hBD-1 and hBD-2 were mainly confined to the granular and spinous layers of gingival epithelium, with hBD-1 in cytoplasm and intercellular space while hBD-2 only in cytoplasm. Healthy control tissues showed higher hBD-2 expression than clinically healthy tissues from patients ($p < 0.05$). Within the patients, periodontal pocket tissues exhibited significantly higher expression of both defensins than the adjacent clinically healthy tissues ($p < 0.05$). Conclusions: With the findings of a decreased expression of hBD-2 in patients compared to healthy subjects and a relatively higher expression of both defensins in periodontal pocket tissues than the adjacent clinically healthy tissues, this study suggests that hBD-1 and hBD-2 play an important role in local host responses to microbial challenge, and hence contribute to the maintenance of periodontal homeostasis. Supported by the Hong Kong Research Grants Council (RGC No. HKU 7310/00M).

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