

MMP-8 activation by head and neck carcinoma radiotherapy

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Background

Radiotherapy (RT) to head and neck area has multiple side effects such as oral mucositis and clinical attachment loss (CAL)

The effect of RT on the oral fluid biomarkers is poorly known. Biomarkers could offer useful information about the side effects of RT on the head and neck area to the periodontium.

Matrix metalloproteinase (MMP) -8 have a key role in periodontitis progression (Figure 1). As such, it is an important diagnostic biomarker for periodontitis.

We investigated levels and molecular forms of the MMP-8 in mouth-rinse samples compared and the clinical periodontal status in head and neck carcinoma (HNC) patients receiving RT.

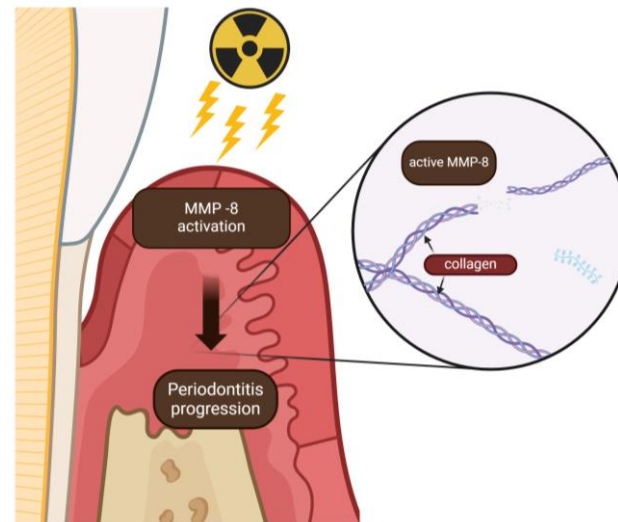


Figure 1. Created with BioRender.com

Materials and methods

21 HNC patients receiving RT from Başakşehir Çam and Sakura City Hospital, Istanbul, Turkey.

Periodontal examination was performed before RT and one month after RT.

Mouth-rinse samples were collected before RT, at the end of RT, and one-month after RT.

Mouth-rinse samples were assayed quantitatively by aMMP-8 point-of-care-kit (PerioSafe®/ ORALyzer®), ELISA analysis, and western immunoblot.

Original article:

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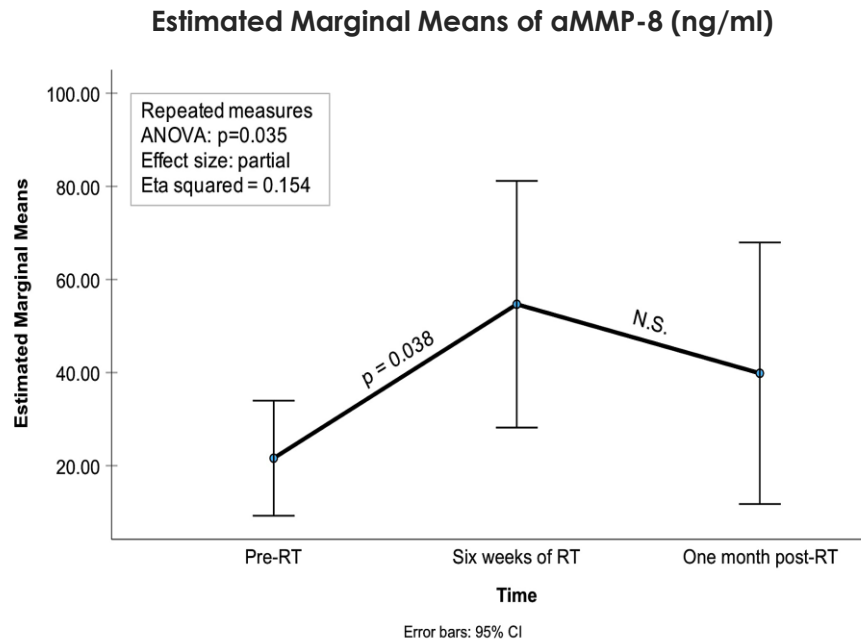


Figure 2: Mean levels of active (a)MMP-8 (ng/mL) ($n = 21$) with 95% confidence interval bars. N.S.=non-significant

Results

All patients were present/ex heavy smokers and had periodontitis (stage I: 4%, II: 38%, III: 33%, IV: 24%. Grade C: 100%).

The mean levels of aMMP-8 increased significantly during RT (21.6 \rightarrow 54.6 ng/ml) $p < 0.05$ (Figure 2).

Periodontal health worsened: clinical attachment loss (CAL), probing depths, and bleeding on probing increased between pre- and post-calculations in periodontal status. CAL was ranging 1–3 mm, on average 1.4 mm (SD=0.6), corresponding rapid progression of periodontitis.

Conclusions

Increased activation of MMP-8 may explain the worsened periodontal health as RT side effect.

aMMP-8 point-of-care mouth-rinse test could be an easy, early detection tool for alarming the risk for periodontitis progression in HNC patients with RT treatment.