Insulin Like Growth Factor Receptor 1 (IGF-1R) and Radiotherapy Resistance in Laryngeal Squamous Cell Cancer (LSCC)

Ali Qureishi (ST7) ORL-HNS
aliqureishi@googlemail.com

Co-authors: K Shah, T Aleksic, S Winter, H Moller, V Macaulay

Kings College London/Oxford University/ Oxford University Hospitals NHS Trust

Introduction:
Salvage surgery is the only option for radiotherapy failure LSCC, but is associated with high morbidity. There is a need to identify biomarkers of radioresistance, to inform treatment decisions. Epidermal growth factor receptor (EGFR) associates with radioresistance in head and neck cancer (HNSCC), and type 1insulin-like growth factor receptor (IGF-1R) correlates with radioresistance in other tumour types. We recently reported that IGF-1R associates with advanced T-stage, HPV negativity and adverse survival in HNSCC. Here, we evaluated IGF-1R and EGFR in predicting radiotherapy failure in LSCC.

Methods:
We scored membrane, cytoplasmic and total (membrane plus cytoplasmic) EGFR and IGF-1R using immunohistochemistry on biopsies and salvage laryngectomies from 63 LSCC patients, including 41 treated with radiotherapy (23 long-term remission, 18 local recurrences) and 22 with primary laryngectomy.

Results:
IGF-1R scores were higher in the biopsies of the radiotherapy failure group, with scores in the membrane of 3.07 vs 1.0 ($p=0.004$), cytoplasm 3.36 vs 2.17 ($p=0.18$) and total IGF-1R 6.43 vs 3.17 ($p=0.01$) compared with those achieving long-term remission. IGF-1R expression was positively associated with tumour size and EGFR expression and was unchanged following radiotherapy. EGFR scores did not correlate with radiotherapy outcomes. Patients undergoing primary laryngectomy had higher T and N stage ($p<0.05$) and higher tumour IGF-1R (8.3 vs. 3.17, $p=0.02$) than those achieving long-term postradiotherapy remission.

Conclusions:
These results suggest that IGF-1R associates with radiotherapy resistance in LSCC. Treatments accounting for IGF-1R status, or molecular therapies targeting this receptor, may have merit in patients whose tumours overexpress IGF-1R.