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## Efficacy and toxicities of elective upper-neck irradiation versus whole-neck irradiation of the uninvolved neck in patients with nasopharyngeal carcinoma: A meta-analysis

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Review Radiother Oncol . 2023 Nov;188:109860.  
doi: 10.1016/j.radonc.2023.109860. Epub 2023 Aug 23.

### Background

This meta-analysis aimed to investigate the efficacy and radiation-related toxicities of upper-neck irradiation (UNI) over whole-neck irradiation (WNI) in patients with unilateral or bilateral node-negative nasopharyngeal carcinoma.

### Methods

We conducted a systematic review to identify studies comparing survival and toxicities between UNI and WNI by searching key databases up to Aug 2022. Hazard ratios (HRs) with 95% confidence intervals (CIs) for regional recurrence-free survival (RRFS), local recurrence-free survival (LRFS), distant metastasis-free survival (DMFS), progression-free survival (PFS), and overall survival (OS) were pooled using R 4.0.5. Risk ratios (RRs) for acute and late radiation-related toxicities were also pooled. Subgroup analyses according to nodal status, radiotherapy techniques, and study type were conducted.

### Results

Eight studies enrolling 2568 patients were included. Patients who received UNI showed similar RRFS (HR 0.99, 95% CI 0.57-1.74,  $P = 0.975$ ), LRFS (HR 0.86, 95% CI 0.53-1.41,  $P = 0.559$ ), DMFS (HR 0.90, 95% CI 0.63-1.29,  $P = 0.581$ ), PFS (1.10, 95% CI 0.73-1.67,  $P = 0.642$ ), and OS (1.03, 95% CI 0.77-1.37,  $P = 0.866$ ) compared with WNI. When stratified by nodal status, the pooled HRs for RRFS in patient subgroups with stage N0 disease, stage N1 with only retropharyngeal lymph nodes metastasis, and unilateral cervical lymph node metastasis were 0.46 (95% CI 0.04-5.16,  $P = 0.529$ ), 1.12 (95% CI 0.29-4.38,  $P = 0.872$ ), and 1.02 (95% CI 0.48-2.16,  $P = 0.968$ ) respectively, none of which reached statistical significance. UNI was associated with lower incidences of grade 1-2 hypothyroidism (RR 0.75, 95% CI 0.57-0.97,  $P = 0.031$ ) and grade 1-2 dysphagia (RR 0.58, 95% CI 0.42-0.80,  $P < 0.001$ ) compared with WNI.

### Conclusion

UNI had similar efficacy and fewer toxicities compared with WNI for patients with unilateral or bilateral node-negative nasopharyngeal carcinoma. The lower-neck sparing of the uninvolved neck is a valid option for N0, N1, and even unilateral N3 diseases in nasopharyngeal carcinoma.