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Optimizing Radiotherapy Timing for Nasopharyngeal Carcinoma: The Impact of Radiation Scheduling on Survival

Clinical Oncology School of Fujian Medical University, Fujian Cancer Hospital
Ying Li, Zihan Chen, Jue Wang, Sufang Qiu

Background

Chronoradiobiology has emerged as a potential field of study with therapeutic implications for cancer treatment. We aimed to investigate the association between radiation chronotherapy and the efficacy and toxicity of patients with nasopharyngeal carcinoma (NPC).

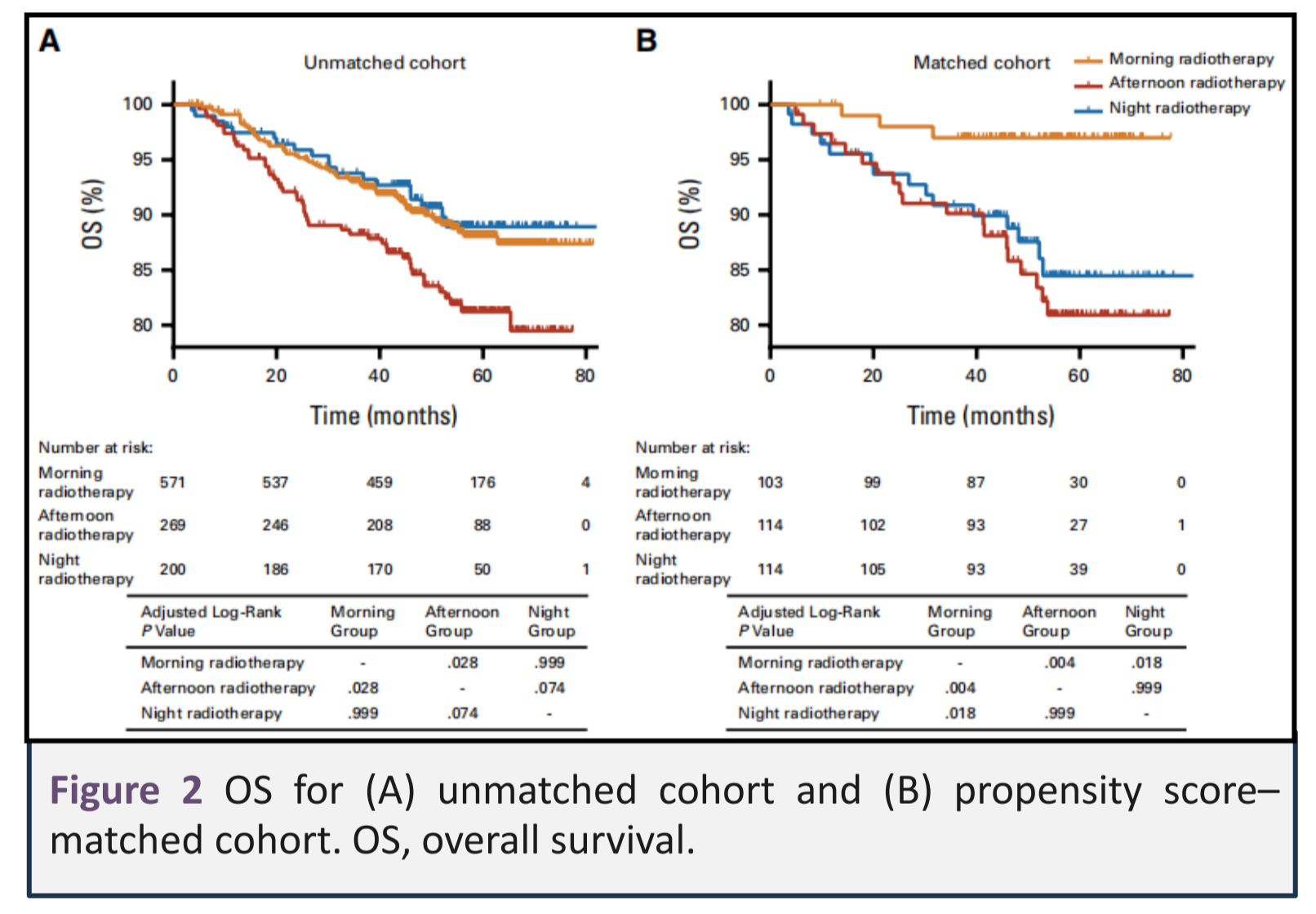
Methods

Patients with nonmetastatic NPC treated with intensity-modulated radiotherapy in Fujian Cancer Hospital between January 2017 and December 2019 were included. Propensity score matching (PSM) with 1:1:1 was used to account for selection bias. Cox regression analysis was performed to explore the impact of radiotherapy timing on patient survival. Sensitivity analysis was implemented to determine the size and directional stability.

Results

One thousand forty patients met study inclusion criteria and 332 patients were included in a PSM cohort. In the unmatched cohort analysis, morning radiotherapy exhibited a significantly superior overall survival (OS) outcome (hazard ratio [HR], 0.60 [95% CI, 0.40 to 0.91], adjusted log-rank P 5 .028) than the afternoon one. After PSM analysis, it was observed that individuals undergoing radiotherapy in the afternoon group (HR, 5.88 [95% CI, 2.55 to 13.58],

adjusted log-rank P 5 .004) and the night group (HR, 4.81 [95% CI, 1.91 to 12.11], adjusted log-rank P 5 .018) displayed a tendency toward shorter OS compared with the morning group. No significant differences in acute treatment-related adverse effects were observed among the three groups. Morning radiotherapy demonstrated consistent robustness in the multivariable analysis, thereby establishing an association with higher OS. The directionality of the effect size was consistent across sensitivity analysis.



Conclusions

These results underscore the potential benefits of scheduling radiotherapy in the morning for NPC management, although prospective studies are needed to confirm these findings.

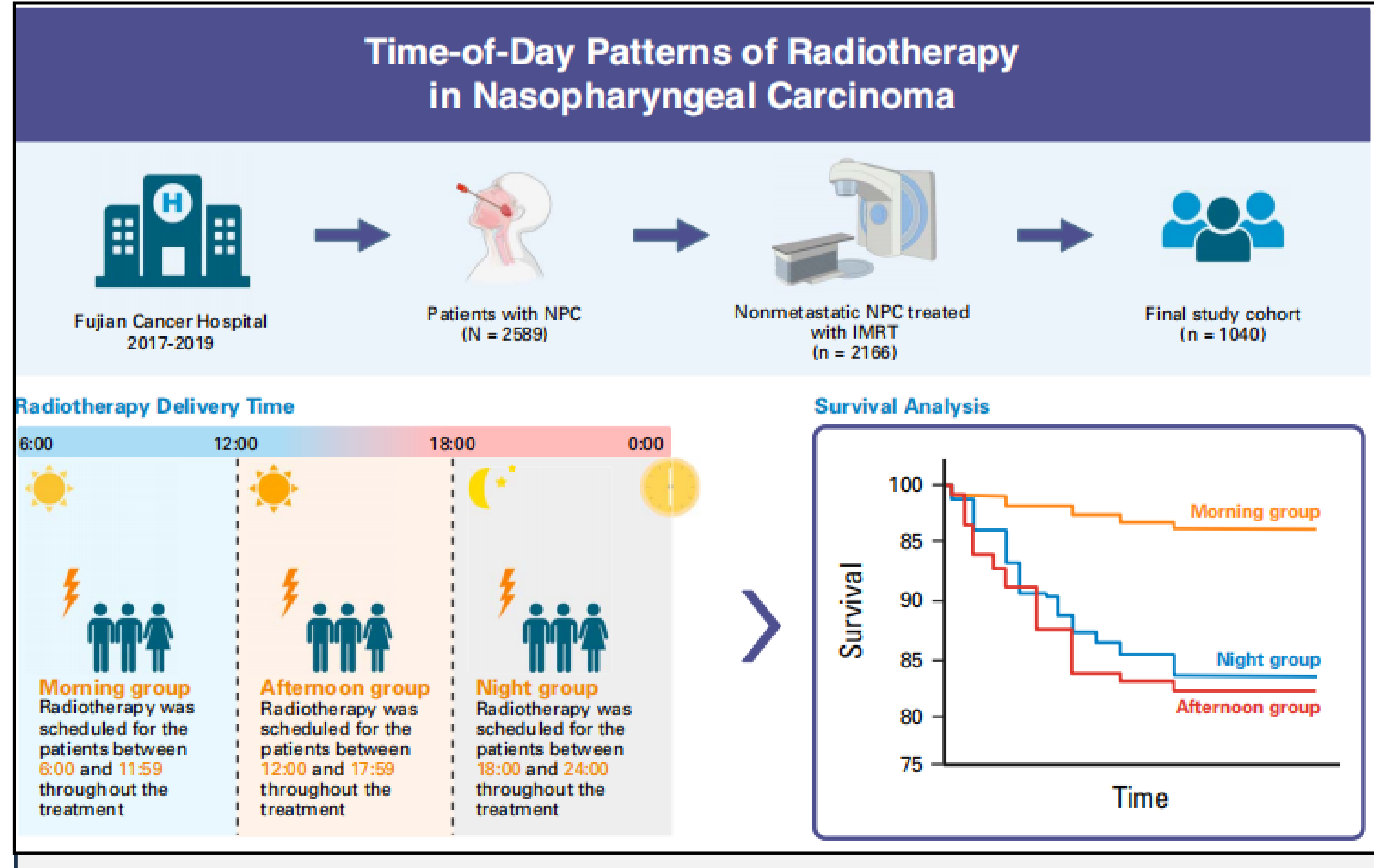


Figure 1 Study profile for the time-of-day patterns of radiotherapy in nasopharyngeal carcinoma. IMRT, intensity-modulated radiotherapy; NPC, nasopharyngeal carcinoma.