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Evaluating WHO, CCI, and CFS Performance in Predicting Non-Small Cell Lung Cancer Survival in Finland: Insights Beyond CONCORD-3

Ville Paappanen

Background: Set against the backdrop of the 2018 CONCORD-3 study, our research focuses on Finland's lung cancer survival rates. Despite similar tax-funded and public healthcare systems, these rates lag behind those of other Nordic countries, prompting an investigation into the underlying causes. This research aims to unravel these disparities, particularly in the context of Finland's success in other cancer domains, contributing to broader efforts to elevate lung cancer outcomes to the level of other Nordic cancer success stories.

Study objective: Our study focuses on evaluating clinical performance classification systems like WHO Score, Charlson Comorbidity Index (CCI), and Clinical Frailty Scale (CFS) for their predictive accuracy in NSCLC survival and treatment outcomes. We analyze the CCI's weighted scoring of comorbidities and the CFS's applicability in assessing elderly patients' fitness or frailty. This research is integral to our broader aim of identifying key factors influencing lung cancer care in Finland. By integrating these systems into lung cancer treatment evaluations, we endeavor to improve care quality and decision-making in treatment strategies, thereby enhancing patient management effectiveness.

Methods: For this study, we analyzed 2018 data on NSCLC patients from Finnish university and central hospitals. This is part of a larger project that includes all lung cancer histologies. Concurrently, we are compiling a 2021 cohort to assess recent advancements in lung cancer care, with a focus on the effectiveness of immunotherapy and personalized treatment modalities. This work is supported by ethical approval from Findata and includes a partnership with the Norwegian Cancer Registry for comparative analysis. Utilizing R, we conducted Kaplan-Meier and Cox regression analyses on a dataset of 427 variables, ensuring robust survival analysis and significance testing.

Results: We found that the WHO Score remains the gold standard in clinical performance evaluation, demonstrating significant statistical differences between scores ($p < 0.05$). **Conclusions:** Our study emphasizes the critical role of functional capacity assessments in lung cancer evaluations, highlighting the need for thorough validation. The underperformance of the CCI in our NSCLC cohort underscores the importance of expanding beyond traditional comorbidity indices. Particularly for the oncogeriatric population, our findings stress the value of individualized functional assessments, like WHO and CFS, in crafting effective, personalized treatment plans.