The Impact of Social Determinants of Health on Textbook Oncological Outcome and Overall Survival of Patients with Locally Advanced Non-Small Cell Lung Cancer

Background:
Textbook oncological outcome (TOO) was previously established as a composite metric for the quality of oncological care that can be used to improve survival for non-small cell cancer (NSCLC). We aimed to determine the role of the patient's social determinants of health (SDH) in achieving TOO and the roles of SDH and TOO on the overall survival of surgically resected NSCLC patients with pathological nodal metastasis.

Methods:
We queried the National Cancer Database between 2010 and 2017. Inclusion criteria included induction therapy-naïve lobectomy for NSCLC with tumor size<7 cm and N1/N2 nodal metastasis. We constructed an SDH index score based on patients' socio-geographical factors. TOO was defined as R0 surgical resection, receipt of adjuvant chemotherapy within 3 months, no 30-day mortality, short hospital stay, and no unplanned readmission. The primary objective was to examine the impact of SDH on achieving TOO (TOO+), which was assessed using logistic regression after categorizing SDH into high, moderate, and low. The secondary objective was to examine the combined roles of SDH and TOO+- on overall survival as determined by Kaplan-Meier and Cox regression analyses after stratifying SDH into high (SDH+) and moderate/low (SDH-).

Results:
We identified 11,274 NSCLC patients eligible for this study, of whom 48% were TOO+. The independent effect of TOO (+/-) on long-term survival was significant with an increase of median survival by 18 months (Fig.1A). After adjusting for confounders, moderate and low SDH decreased the likelihood of achieving TOO by 14% (aOR:0.86, CI: 0.79-0.94) and 24% (aOR:0.76, CI:0.67-0.85) when compared to high SDH, respectively (p<0.001). Using the composite SDH index, the impact of SDH on overall survival was significant for either TOO+ or TOO- patients (Fig.1B-C), indicating that SDH+/TOO+ have the best overall survival (median survival 6.6 years vs 5.2 years [SDH-/TOO+], 4.9 years [SDH+/TOO-], and 3.9 years [SDH-/TOO-]). After accounting for confounders, SDH+ patients have 20% lower mortality than SHD-patients (aHR:0.80, CI:0.75-0.85). TOO remained independently significant, reducing mortality by 23% (aHR:0.77, CI:0.73-0.82).

Conclusions:
SDH has a significant impact on achieving TOO+ in patients with N1/N2 NSCLC. Moreover, SDH further influences TOO-driven overall post-treatment survival of this patient population. This study brings into focus the importance of SDH on optimal care and survival.

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