Editorial Commentary

Risk models to predict outcomes following lung cancer surgery: where are we at?

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Quality of care optimization is essential in modern healthcare environments and particularly in elective cancer surgical settings, as adverse events are frequent among patients who undergo invasive procedures.

This is particularly true today, as the evolution of anaesthetic and surgical techniques is pushing the boundaries of operability, and an increasing number of elderlies with a wide variety of comorbidities can benefit from minimally invasive operations. Besides, the advances of targeted therapies are expanding the range of treatment options, proving to be valuable alternatives to surgery.

Therefore, with the advent of personalized medicine and tailored therapies, several predictive models have been developed to support surgical decision-making, thus offering surgical candidates the most appropriate treatment.

According to the latest National Institute for Health and Care Excellence (NICE) guidelines for the diagnosis and management of lung cancer, the preoperative assessment of elective surgical patients should include a global risk scoring system to estimate the risk of death (1). In this regard, a prominent example is the European Society Objective Score (2), that allows us to determine the risk of in-hospital death following lung resection. Similarly, the Thoracoscore (3) helps to predict 30-day mortality after thoracic surgery and has received both internal and external validation (4). The reproducibility of these models, however, is unclear, as several studies have reported inadequate performances when they are employed in different geographical populations (5-7).

More recently, Brunelli and colleagues (8) elaborated two prediction models for risk-adjusting morbidity (EuroLung1) and mortality (EuroLung2), based on an extensive database of the European Society of Thoracic Surgery, including almost 48,000 patients undergoing anatomical pulmonary resection. They proved to be reliable tools for internal audit of performance when employed in three different European centres (9). However, in a Japanese single-centre analysis (10), the EuroLung scores overestimated both morbidity and mortality and could not be directly applied to the study population.

Similarly, Chinese researchers reported promising results with a novel nomogram prognostic model forecasting lung cancer-related death rate, another cancer-related death rate, and non-cancer-related death rate after pulmonary resection (11).

Lately, the emerging landscape of immune therapies has prompted researchers to construct lung cancer immune-related prognostic indices, that showed high accuracy in survival forecasting, particularly for the squamous cell histotypes (11,12).

In conclusion, prognostic risk scores are being increasingly used in thoracic surgery, especially in patients undergoing pulmonary resection. They are valuable tools for improving patient quality of care and designing personalized treatment strategies. However, such complex models need to be established on rigorous methodology and both internal and external validation.

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