Risk of recurrence of gastrointestinal stromal tumour after surgery: an analysis of pooled population-based cohorts

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Summary

Background The risk of recurrence of gastrointestinal stromal tumour (GIST) after surgery needs to be estimated when considering adjuvant systemic therapy. We assessed prognostic factors of patients with operable GIST, to compare widely used risk-stratification schemes and to develop a new method for risk estimation.

Methods Population-based cohorts of patients diagnosed with operable GIST, who were not given adjuvant therapy, were identified from the literature. Data from ten series and 2560 patients were pooled. Risk of tumour recurrence was stratified using the National Institute of Health (NIH) consensus criteria, the modified consensus criteria, and the Armed Forces Institute of Pathology (AFIP) criteria. Prognostic factors were examined using proportional hazards and non-linear models. The results were validated in an independent centre-based cohort consisting of 920 patients with GIST.

Findings Estimated 15-year recurrence-free survival (RFS) after surgery was 59·9% (95% CI 56·2–63·6); few recurrences occurred after the first 10 years of follow-up. Large tumour size, high mitosis count, non-gastric location, presence of rupture, and male sex were independent adverse prognostic factors. In receiver operating characteristics curve analysis of 10-year RFS, the NIH consensus criteria, modified consensus criteria, and AFIP criteria resulted in an area under the curve (AUC) of 0·79 (95% CI 0·76–0·81), 0·78 (0·75–0·80), and 0·82 (0·80–0·85), respectively. The modified consensus criteria identified a single high-risk group. Since tumour size and mitosis count had a non-linear association with the risk of GIST recurrence, novel prognostic contour maps were generated using non-linear modelling of tumour size and mitosis count, and taking into account tumour site and rupture. The non-linear model accurately predicted the risk of recurrence (AUC 0·88, 0·86–0·90).

Interpretation The risk-stratification schemes assessed identify patients who are likely to be cured by surgery alone. Although the modified NIH classification is the best criteria to identify a single high-risk group for consideration of adjuvant therapy, the prognostic contour maps resulting from non-linear modelling are appropriate for estimation of individualised outcomes.

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