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Immune profile and survival outcomes in stage 2 colon cancer

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Background: Tumor associated immune response impacts outcomes in cancer. In colon cancer (CC), a good immune response, as represented by a dense lymphocytic infiltrate, is known to be associated with improved overall survival (OS). To date studies have used a subjective scoring system and OS benefits have been presumed to solely be the consequence of reduced cancer recurrence. The relationship with deficient mismatch repair (dMMR) status, a good prognostic marker that is typically associated with an immune infiltrate, remains unexplored. We examined an objectively determined Immune Profile (IP) and survival outcomes in stage 2 CC.

Methods: Stage 2 CC cases were identified from a hospital registry that prospectively records comprehensive point of care data, including recurrence free survival (RFS) and OS. MMR status was determined by immunohistochemistry. The density of CD3 and CD8 T-cells within each tumor was assessed by immunostaining and automated image analysis. A pattern recognition algorithm scored CD3 and CD8 density at the tumor core (TC) and invasive margin (IM). Raw scores for each region (CD3TC, CD3IM, CD8TC and CD8IM) were added and categorized as IP High or IP Low. Survival analyses used the Kaplan–Meier method and log-rank test.

Results: We included 463 subjects with stage II CC, median age 70.4 years, with median follow-up 57.7 months. 93 (16.5%) tumors were dMMR. 220 (47.5%) tumors were categorized as IP high. IP High was associated with improved survival outcomes compared to IP Low, including RFS (HR 0.25, p<0.001), post-recurrence survival (HR 0.20, p<0.001), cancer-specific survival (HR 0.08, p<0.001) and OS (HR 0.10, p<0.001). The improved RFS for IP high cases was independent of MMR status (dMMR: HR 0.10, p=0.03; pMMR: HR 0.27, p<0.001). In patients without recurrence IP High was associated with reduced non-cancer deaths (HR 0.10, p<0.001).

Conclusion: Using an automated and objective measure, we have confirmed that immune infiltration is strongly associated with improved RFS and OS in stage II CC, independent of MMR status. We have also shown that a good immune response (IP High) is associated with post recurrence survival (where cancer recurs) and with reduced non-cancer mortality in patients that remain recurrence free.

Biography

Ben Tran is a Medical Oncologist at the Victoria Comprehensive Cancer Centre with a focus on uro-oncology and colorectal cancer. His research interests include early drug development and studying the tumor associated immune response.

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