

Poster ISOQOL

Investigating heterogeneity for survival in a pooled cancer cohort of more than 10,000 patients from 30 EORTC Randomized Trials

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Background

Patient-centered outcome research investigates heterogeneity in survival based on patients' socio-demographic, clinical and health related quality of life (HRQOL) factors. Various modeling techniques trying to capture the underlying heterogeneity ultimately result in different hazard ratios, confidence intervals and their significance. Our analysis compares a stratified Cox model in a cancer population cohort with a more complex frailty model.

Methods

A pooled dataset of 30 EORTC Randomized Controlled Trials in 11 cancer types included patient-reported baseline measures of HRQOL using the EORTC QLQ-C30. Age (≤ 60 vs. >60), gender, distant metastasis (no vs. yes), World Health Organization (WHO) performance status (0-1 vs. 2-3) were included as common factors across all cancer sites. The prognostic significance ($p < .05$) of the clinical variables and 15 QLQ-C30 scales for survival were investigated using a Cox proportional hazard model with cancer site as a stratification factor and a frailty model where cancer site was defined as a random effect.

Results

In the final stratified model, physical functioning (hazard ratio [HR] 0.94; 95% Confidence Interval (CI); 0.92-0.96; $p < 0.001$), pain (1.04; 1.02-1.06; $< .0001$) and appetite loss (1.05; 1.03-1.06; $< .0001$) added significant prognostic information alongside the parameters age (1.17; 1.06 -1.28; 0.0001), gender (0.74; 0.67-0.82; < 0.0001) and distant metastasis (1.70; 1.49-1.93; $< .0001$). The final frailty model, including both clinical and HRQOL data; physical functioning (0.94; 0.93-0.95; $< .0001$), pain (1.04; 1.03-1.05; $< .0001$) and appetite loss (1.05; 1.05-1.05; $< .0001$) provided significant prognostic information alongside the parameters age (1.15; 1.10-1.20; $< .0001$), gender (0.73; 0.70-0.76; 0.0005) and distant metastasis (1.72; 1.62-1.82; $< .0001$).

Conclusion

Our results show that both models retain the same parameters as significant, but the frailty model reports smaller confidence intervals. A frailty model may benefit analysis of clinical trials with correlated data and provides a rationale for future protocol as it increases the robustness of our findings.