Modelling the Effect of Accumulating Recurrences and Progression in Bladder Cancer Data

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Multiple sequential recurrences are one of the most important characteristics of superficial transitional cell carcinoma of the bladder. Many investigations have been performed to identify predictive factors for the first recurrence, but very few studies have investigated the effect of accumulating multiple recurrences of this cancer and its clinicopathologic factors associated and the aggressive progression as a terminating event. We consider different models for analyzing time-to-recurrences which incorporate the effect of accumulating reoccurrences as well as the correlation within individuals using a frailty term. We use the penalized likelihood estimation to nonparametric estimation of the continuous hazard function. Besides, two approaches are considered in this analysis to represent different aspects of the bladder cancer: the first one attempts to focus on the effect of the clinicopathological factors effects on recurrences by regarding a progression before the recurrence as a censoring event, meanwhile the second one analyzes these same effects on either recurrence or progression, whichever comes first.

References


