Abstract

Background: Gastric cancer (GC) has been considered as the 5th most common type of cancer and the third leading cause of cancer-associated death worldwide. The aim of this historical cohort study was to evaluate the survival predictors for all patients with GC using the Cox proportional hazards, extended Cox, and gamma-frailty models.

Methods: This historical cohort study was performed according to documents of 1695 individuals having GC referred to three medical centers in Iran from 2001 to 2018. First, most significant prognostic risk factors on survival were selected, Cox proportional hazards, extended Cox, gamma-frailty models were applied to evaluate the effects of the risk factors, and then these models were compared with the Akaike information criterion.

Results: The age of patients, body mass index (BMI), tumor size, type of treatment and grade of the tumor increased the hazard rate (HR) of GC patients in both the Cox and frailty models ($P < 0.05$). Also, the size of the tumor and BMI were considered as time-varying variables in the extended Cox model. Moreover, the frailty model showed that there is at least an unknown factor, genetic or environmental factors, in the model that is not measured ($P < 0.05$).

Conclusions: Some prognostic factors, including age, tumor size, the grade of the tumor, type of treatment and BMI, were regarded as indispensable predictors in patients of GC. Frailty model revealed that there are unknown or latent factors, genetic and environmental factors, resulting in the biased estimates of the regression coefficients.

Keywords: Gastric cancer, Survival analysis, Extended cox, Frailty, Akaike information criterion