APPROXIMATED LIKELIHOOD METHOD FOR SEMIPARAMETRIC REGRESSION MODELS WITH MEASUREMENT ERROR

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It is common to use semiparametric regression model when analyzing dose-response relationship between incidence of disease and continuous covariates in the epidemiology study. If some covariates are subject to measurement error, the dose-response relationship may be misspecified and parameter estimates of other covariates modelled parametrically may be also biased. Berry, Carroll and Ruppert (2002) proposed a Bayesian semiparametric regression model, in which the covariates are assumed to follow a multivariate normal distribution. In this presentation, we describe an approximated likelihood method to estimate a semiparametric regression model when measurement error under less restrictive distributional assumption of the covariates. We consider that response variable is failure time data and the regression function is modelled with smoothing splines. Approximation of the likelihood is conducted by using Gauss-Hermite quadrature. We provide simulation studies with several linear and nonlinear functions. Our simulations indicate that the proposed method shows better mean squared error properties in parameters estimate of covariate modelled parametrically. We also provide an real example of the Japan Diabetes Complication Study.