

Joint Modeling of Longitudinal CD4 Cell Count and Time-to-Default from Highly Active Antiretroviral Therapy in HIV/AIDS Patients in Ethiopia: a Comparison of Separate and Joint Models

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Abstracts

Longitudinal and survival data are usually generated in HIV/AIDS Highly Active Antiretroviral Therapy (HAART) follow-up and other related clinical trials. Joint modeling approach is used to describe the common behavior of a longitudinal and survival data. The objective of this study was to compare separate and joint models in the analysis of longitudinal CD4 cell counts and default time of HIV/AIDS patients under HAART treatment using a Bayesian approach. The study population consists of all HIV/AIDS patients who were 18 and above years old under HAART follow-up from 2007 to 2011 in Jimma University Specialized Hospital, southwest Ethiopia. Of the total 1464 patients, 329 (22.50%) were defaulted from the HAART treatment. The estimated median defaulting time from HAART was 97.69 months (95% CI: 81.87, 116.57). Analysis of the data using both separate and joint models revealed that incorporation of patient-specific CD4 variability significantly improved the fitness of the models as it resulted in a lower DIC values. The parameter estimates of the separate and joint models were consistent. However, the joint model was parsimonious and also fits the data better than the separate models.

Keywords: Joint modeling; Bayesian; Longitudinal; Survival; HAART; HIV/AIDS