Dose individualization and variable selection by using the Bayesian lasso in early phase dose finding trials

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Summary. Recommended phase 2 doses for some drugs may differ according to a patient's clinical or genetic characteristics. We develop a new method that determines the individualized optimal dose according to patterns of patient covariates and selects the covariates that are associated with efficacy and toxicity in early phase trials for evaluating multiple patient covariates of interest. To address the difficulty of high dimensional estimation of model parameters with a limited sample size, we propose the use of the Bayesian least absolute shrinkage and selection operator, which is a penalized regression approach. We demonstrate the potential utility of this proposed method through various simulation studies.