

Bayesian network modelling of upper gastrointestinal bleeding

ABSTRACT

Bayesian networks are graphical probabilistic models that represent causal and other relationships between domain variables. In the context of medical decision making, these models have been explored to help in medical diagnosis and prognosis. In this paper, we discuss the Bayesian network formalism in building medical support systems and we learn a tree augmented naive Bayes Network (TAN) from gastrointestinal bleeding data. The accuracy of the TAN in classifying the source of gastrointestinal bleeding into upper or lower source is obtained. The TAN achieves a high classification accuracy of 86% and an area under curve of 92%. A sensitivity analysis of the model shows relatively high levels of entropy reduction for color of the stool, history of gastrointestinal bleeding, consistency and the ratio of blood urea nitrogen to creatinine. The TAN facilitates the identification of the source of GIB and requires further validation.

Keyword: Bayesian networks; Medical support systems; Upper gastrointestinal bleeding