A Medical Resource Forecasting Model for Emergency Room Patients with Acute Hepatitis

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Abstract : Taiwan is a hyper endemic area for the Hepatitis B virus (HBV). The estimated total number of HBsAg carriers in the general population who are more than 20 years old is more than 3 million. Therefore, a case record review is conducted from January 2003 to June 2007 for all patients with a diagnosis of acute hepatitis who were admitted to the Emergency Department (ED) of a well-known teaching hospital. The cost for the use of medical resources is defined as the total medical fee. In this study, principal component analysis (PCA) is firstly employed to reduce the number of dimensions. Support vector regression (SVR) and artificial neural network (ANN) are then used to develop the forecasting model. A total of 117 patients meet the inclusion criteria. 61% patients involved in this study are hepatitis B related. The computational result shows that the proposed PCA-SVR model has superior performance than other compared algorithms. In conclusion, the Child-Pugh score and echogram can both be used to predict the cost of medical resources for patients with acute hepatitis in the ED.

Keywords : acute hepatitis, medical resource cost, artificial neural network, support vector regression
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