Abstract: **P1513**

**Artificial neural network as a predictive instrument of hemorrhagic complications in patients undergoing pacemaker implantation and receiving anticoagulant treatment with dabigatran**

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**Topic(s):**
Oral Anticoagulation

**Citation:**
Objective. To appraise the effectiveness of artificial neural network (ANN) based on routine coagulation parameters to predict occurrence of complications after pacemaker implantation in patients receiving dabigatran etexilate.

Methods. Retrospective study included data of 128 patients with atrial fibrillation receiving dabigatran, who underwent pacemaker implantation. The first 70 patients were used to create and train ANN and data of the following 58 patients were used to validate the ANN.

Information about hemorrhagic events was collected during the hospitalization. The outcome variable was defined as "1" when some hemorrhagic complication present, or as "0" when patient was free of such complications. The set of input parameters (covariates) included 6 routine coagulation tests: protrombin time, prothrombin index, INR, partial thromboplastin time (PTT), fibrinogen, thrombin time (TT). Establishment of ANN models was performed by using the Multilayer Perceptron procedure of IBM SPSS Statistics 23.

Results. The cases of active dataset were randomly assigned into training (44%), testing (17%), and holdout samples (39%). We used hyperbolic tangent activation functions for the hidden layer, softmax function for output layers, and standard training settings (Figure 1). Classification results showed 87.5% of correctly classified cases in training sample, 78.4% in testing and 89% in holdout samples. Following predictors have the highest normalized importance: PTT (100%), TT (77.3%), fibrinogen (68.2%).

Area under the receiver operating curve for ANN was 0.897, which means a good accuracy of diagnostic test. Conclusions. The use of ANN can improve prediction of post-operative hemorrhagic complications after pacemaker implantation in patients receiving dabigatran.

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