ALTERED COAGULATION IN INFLAMMATORY BOWEL DISEASE: PREDICTORS OF THE DISEASE STATUS

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Background To evaluate the coagulation status in patients with inflammatory bowel disease (IBD) and explore the possibility of using coagulation parameters to predict the disease status and assist the diagnosis.

Methods We enrolled 987 hospitalised IBD patients and 1027 healthy controls during March 2011 to June 2016. The coagulation parameters between IBD patients and healthy controls were compared. Correlations between coagulation and disease status were evaluated. Computer-based machine learning including artificial neural network (ANN) and support vector machine (SVM), together with receiving operator curve (ROC) was used to estimate the value of coagulation parameters in the diagnosis of IBD.

Results Compared with healthy controls, IBD patients showed higher platelet count and plateletcrit, lower mean platelet volume, platelet distribution width and platelet-large cell ratio, prolonged prothrombin time and activated partial thromboplastin time, and increased fibrinogen and INR (p<0.001). CRP and ESR significantly correlated with hyper-coagulation (nearly all p<0.05). In ulcerative colitis (UC) patients, coagulation parameters demonstrated significant correlation with clinical activity and endoscopic activity. Multiple linear regression analysis revealed that in the Crohn’s disease (CD) group, patients with colon involvement displayed more obviously altered coagulation status (all p<0.05). Structuring lesion and perianal disease were also related with part of the parameters. In UC patients, abnormality of coagulation status was positively paralleled with disease extent. ROC analysis demonstrated that coagulation parameters were of medium predictive value for diagnosing IBD since the area under ROC was 0.748. The overall accuracy of the ANN model was 0.75 with the sensitivity of 73.3% and the specificity of 76.5% while in the SVM model, the overall accuracy was 0.744 with the sensitivity of 67.4% and the specificity of 77.0%.

Conclusions Hyper-coagulation is present in IBD patients. Disease status and coagulation are closely correlated. In CD patients, coagulation parameters are able to indicate the level of inflammatory biomarkers, the location of the lesion, disease behaviour as well as the presence of perianal disease while in UC patients, coagulation parameters are indicative of the level of inflammatory biomarkers, endoscopic activity and disease extent.