Easy and Low-Cost Identification of Metabolic Syndrome in Patients Treated with Second-Generation Antipsychotics: Artificial Neural Network and Logistic Regression Models.

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Abstract

OBJECTIVE: Metabolic syndrome (MetS) is an important side effect of second-generation antipsychotics (SGAs). However, many SGA-treated patients with MetS remain undetected. In this study, we trained and validated artificial neural network (ANN) and multiple logistic regression models without biochemical parameters to rapidly identify MetS in patients with SGA treatment. METHOD: A total of 383 patients with a diagnosis of schizophrenia or schizoaffective disorder (DSM-IV criteria) with SGA treatment for more than 6 months were investigated to determine whether they met the MetS criteria according to the International Diabetes Federation. The data for these patients were collected between March 2005 and September 2005. The input variables of ANN and logistic regression were limited to demographic and anthropometric data only. All models were trained by randomly selecting two-thirds of the patient data and were internally validated with the remaining one-third of the data. The models were then externally validated with data from 69 patients from another hospital, collected between March 2008 and June 2008. The area under the receiver operating characteristic curve (AUC) was used to measure the performance of all models. RESULTS: Both the final ANN and logistic regression models had high accuracy (88.3% vs 83.6%), sensitivity (93.1% vs 86.2%), and specificity (86.9% vs 83.8%) to identify MetS in the internal validation set. The mean +/- SD AUC was high for both the ANN and logistic regression models (0.934 +/- 0.033 vs 0.922 +/- 0.035, P = .63). During external validation, high AUC was still obtained for both models. Waist circumference and diastolic blood pressure were the common variables that were left in the final ANN and logistic regression models. CONCLUSION: Our study developed accurate ANN and logistic regression models to detect MetS in patients with SGA treatment. The models are likely to provide a noninvasive tool for large-scale screening of MetS in this group of patients.