Prediction of successful weight reduction after bariatric surgery by data mining technologies

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摘要

Abstract

Background　Surgery is the only long-lasting effective treatment for morbid obesity. Prediction on successful weight loss after surgery by data mining technologies is lacking. We analyze the available information during the initial evaluation of patients referred to bariatric surgery by data mining methods for predictors of successful weight loss.

Methods　249 patients undergoing laparoscopic mini-gastric bypass (LMGB) or adjustable gastric banding (LAGB) were enrolled. Logistic Regression and Artificial Neural Network (ANN) technologies were used to predict weight loss. Overall classification capability of the designed diagnostic models was evaluated by the misclassification costs.

Results　We studied 249 patients consisting of 72 men and 177 women over 2 years. Mean age was 33 ± 9 years. 208 (83.5%) patients had successful weight reduction while 41 (16.5%) did not. Logistic Regression revealed that the type of operation had a significant prediction effect (P = 0.000). Patients receiving LMGB had a better weight loss than those receiving LAGB (78.54% ± 26.87 vs 43.65% ± 26.08). ANN provided the same predicted factor on the type of operation but it further proposed that HbA1c and triglyceride were associated with success. HbA1c is lower in the successful than failed group (5.81 ± 1.06 vs 6.05 ± 1.49; P = NS), and triglyceride in the successful group is higher than in the failed group (171.29 ± 112.62 vs 144.07 ± 89.90; P = NS).

Conclusion　Artificial neural network is a better modeling technique and the overall predictive accuracy is higher on the basis of multiple variables related to laboratory tests. LMGB, high preoperative triglyceride level, and low HbA1c

level can predict successful weight reduction at 2 years.

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