The Independent Association Between Dietary Protein Energy Ratio and Sleep Quality Among Chinese Patients with Type 2 Diabetes

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Abstract

Background Current clinical evidence regarding the association between protein intake and sleep quality remains limited and inconsistent. *Objective* To investigate the association between dietary protein energy ratio with sleep quality among Chinese patients with type 2 diabetes (T2DM). *Methods* A cross-sectional study was conducted among 193 T2DM patients recruited by convenience sampling. Twenty-four-hour dietary recall questionnaire was used to evaluate the energy contribution of dietary macronutrients. Pittsburgh Sleep Quality Index (PSQI) was adopted to assess sleep quality. Restricted cubic spline (RCS) regression was applied to test nonlinear relationships, while binary logistic regression was used to verify the independent correlation between protein energy ratio and sleep quality. Receiver operating characteristic (ROC) curve analysis was further performed to determine the optimal cut-off value of dietary protein energy contribution for predicting poor sleep status. *Results* The prevalence of clinically significant sleep disturbance was 56.5%. RCS analyses indicated no obvious nonlinear associations of protein energy proportion with sleep quality. Binary logistic regression revealed that higher dietary protein energy contribution was an independent protective factor against sleep disturbance (OR=0.93, 95%CI 0.89– 0.98). A cut-off value of 19.6% dietary protein energy contribution ($p < 0.001$, AUC 0.65, standard error 0.04) predicted poor sleep quality risk. Addiotnally, a higher dietary protein proportion served as a protective factor against poor sleep quality, especially among male patients, those aged ≥ 60 years and individuals with BMI < 24 kg/m^2. *Conclusions* A dietary protein energy contribution below 19.6% was associated with elevated risk of sleep disturbance among individuals with T2DM. Rational regulation of dietary protein intake should be highlighted, especilly for male patients aged ≥ 60 years with BMI < 24 kg/m^2, to optimize their sleep quality.

Keywords

Macronutrients, Sleep Quality, Type 2 Diabetes