Oxidative Markers for Prediction of Transition to Psychosis From the Clinical High-risk State

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Introduction

Predicting transition from clinical high risk (CHR) to first episode psychosis has proven difficult. Assessment of oxidative stress biomarkers and the niacin skin flush response (NSFR) may improve prediction accuracy.

Objectives

To predict transition to psychosis based on combined clinical and blood biomarker.

Aims

To analyse data from patients in placebo group of a 12-week trial of omega-3 fatty acid supplementation in CHR. Transition likelihood ratios (LRs) for baseline historical risks, clinical assessments (PANSS subscales and total, GAF), NSFR and blood markers (nervonic acid, superoxide dismutase, glutathione) were calculated. Variables with the highest positive and lowest negative LRs were included in an odds ratio form of Bayes' rule transition prediction models. Model accuracy was calculated by area under the receiver operating curves (AUROC) of each model.

Results

1-year transition to psychosis was 28% (n=40). Historical data showed no predictability (sensitivity 30%, specificity 100% (AUROC)=0.688, p=0.085). Clinical assessments alone produced a sensitivity of 30% at a specificity of 95% (AUROC=0.83, p<0.0001). The biomarker panel alone predicted transition with 40% sensitivity and 100% specificity (AUROC=0.73, p=0.03). Combining history and clinical assessment provided no improvement above clinical data alone (sensitivity = 30%, specificity = 100%, AUROC=0.85, p< 0.0001). The combination of history, clinical assessment and biomarkers identified transition with a sensitivity of 60% and specificity of 100% (AUROC=0.87, p< 0.0001).

Conclusions

Probabilistic models combining biomarkers and clinical data are able to target high-risk subgroups within CHR and may help to personalise treatment.