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EGF Serum Level in Diagnosis and Prediction of Mood Disorder in Adolescents and Young Adults

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Abstract : Epidermal growth factor (EGF) is a well-known neurotrophic factor that involves in neuronal growth and synaptic plasticity. The proteomic research provided in order to identify novel candidate biological markers for mood disorders focused on elevated EGF serum level in patients during depression episode. However, the EGF association with mood disorder spectrum among adolescents and young adults has not been studied extensively. In this study, we aim to investigate the serum levels of EGF in adolescents and young adults during hypo/manic, depressive episodes and in remission compared to healthy control group. In our study, we involved 80 patients aged 12-24 years in 2-year follow-up study with a primary diagnosis of mood disorder spectrum, and 35 healthy volunteers matched by age and gender. Diagnoses were established according to DSM-IV-TR criteria using structured clinical interviews: K-SADS for child and adolescents, and SCID for young adults. Clinical and biological evaluations were made at baseline and euthymic mood (at 3th or 6th month of treatment and after 1 and 2 years). The Young Mania Rating Scale and Hamilton Rating Scale for Depression were used for assessment. The study protocols were approved by the relevant ethics committee. Serum protein concentration was determined by Enzyme-Linked Immunosorbent Assays (ELISA) method. Human EGF (cat. no DY 236) DuoSet ELISA kit was used (R&D Systems). Serum EGF levels were analysed with following variables: age, age under 18 and above 18 years old, sex, family history of affective disorders, drug-free vs. medicated. Shapiro-Wilk test was used to test the normality of the data. The homogeneity of variance was calculated with Levene's test. EGF levels showed non-normal distribution and the homogeneity of variance was violated. Non-parametric tests: Mann-Whitney U test, Kruskall-Wallis ANOVA, Friedman's ANOVA, Wilcoxon signed rank test, Spearman correlation coefficient was applied in the analyses The statistical significance level was set at $p<0.05$. Elevated EGF level at baseline ($p=0.001$) and at month 24 ($p=0.02$) was detected in study subjects compared with controls. Increased EGF level in women at month 12 ($p=0.02$) compared to men in study group have been observed. Using Wilcoxon signed rank test differences in EGF levels were detected: decrease from baseline to month 3 ($p=0.014$) and increase comparing: month 3 vs. 24 ($p=0.013$); month 6 vs. 12 ($p=0.021$) and vs. 24 ($p=0.008$). EGF level at baseline was negatively correlated with depression and mania occurrence at 24 months. EGF level at 24 months was positively correlated with depression and mania occurrence at 12 months. No other correlations of EGF levels with clinical and demographical variables have been detected. The findings of the present study indicate that EGF serum level is significantly elevated in the study group of patients compared to the controls. We also observed fluctuations in EGF levels during two years of disease observation. EGF seems to be useful as an early marker for prediction of diagnosis, course of illness and treatment response in young patients during first episode od mood disorders, which requires further investigation. Grant was founded by National Science Center in Poland no 2011/03/D/NZ5/06146.

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