A cross-sectional study of adiponectin in patients with schizophrenia

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Background: The adipose tissue synthetises a whole series of hormones which are involved in the regulation of energy homeostasis, lipid metabolism and the action of insulin. Among those cytokines, adiponectin, one of the most produced adipocyte factors, is a recently identified adipocyte-derived protein associated with metabolic abnormalities such as obesity, insulin resistance and diabetes. The level of adiponectin is reduced in obesity and type II diabetes. Metabolic disorders are a growing concern in patients treated with antipsychotic medication. In this crosssectional study, we wanted to assess the adiponectin levels of schizophrenic patients. The first goal was to evaluate whether adiponcetin levels fluctuate in the same way as the general nonschizophrenic population and also to evaluate whether these would be influenced by the presence of metabolic abnormalities and/or the antipychotic treatments.

Methods: Fasting adiponectin levels were assessed in a crosssectional sample of 294 patients with schizophrenia treated with antipsychotic medication. The mean age of the patients was 36.4 years. 68% of the patients were male. The majority of the patients were treated with only one antipsychotic(85.4%). 88% of the patients received a second generation antipsychotic. The patients are enrolled in a prospective study evaluating the metabolic effects of antipsychotics. All underwent an extensive metabolic screening, including an oral glucose tolerance test. patients were initiated on an overnight fast and were monitored during the OGTT. The influence of adiponectin levels on the presence/ absence of the metabolic syndrome and the presence/absence of glucose abnormalities on continuous variables was assessed by means of an independent samples t-test. Patients treated for diabetes were excluded form the analysis. The association between categorical variables was assesssed by a chi-square test. The study was approved by the ethics committee and all the patients gave a written informed consent.

Results: Adiponectin levels are correlated with BMI, and differ significantly between patients with normal weight, overweight or obesity ($p = 0.0001$). Patients meeting criteria for the metabolic syndrome, either with NCEP ATP-III criteria (28.2%) or with the more recent IDF criteria (35.7%), have significantly lower adiponectin levels than patients without a metabolic syndrome ($p = 0.0001$). Patients without glucose abnormalities (82.7%) have significantly higher adiponectin levels compared to patients with glucose abnormalities (IFG and/or IGT, 9.9%) or patients meeting ADA criteria for diabetes (7.5%) ($p = 0.004$). Adiponectin levels are lowest in diabetic patients. After controlling for BMI, antipsychotic medication significantly influences adiponectin levels ($p<0.01$). Adiponectin levels are significantly lower ($p <0.05$) in patients treated with olanzapine.

Conclusions: In schizophrenic patients, adiponectin levels vary in the same way as described in the normal, overweight and obese non schizophrenic population. Also, adiponectin levels in schizophrenic patients with and without metabolic syndrome mirror what is observed in the general population. Preliminary data suggests that the antipsychotic treatment may influence adiponectin regulation, a finding that should be verified in longitudinal studies.