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EFFECT OF ATYPICAL ANTIPSYCHOTICS ON GLUCOSE AND LIPID METABOLISM

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ABSTRACT

Atypical antipsychotics are used as the first-line drug in treating schizophrenia. However, the disorder of glucose or lipid metabolism was also known as one of the serious adverse effect which leads to discontinuation of psychiatric therapy. The causes of these adverse effects have not entirely clarified. In this study, we investigated the effects of antipsychotics on the differentiation of adipocytes. 3T3-L1 mouse preadipocytes were cultured and induced to differentiate into mature adipocytes. Cells were cultured for 2 days in differentiation induction medium after 2 days of confluence, followed by culturing for 5 days in culture medium. To assess the effect of atypical antipsychotics on differentiation of adipocytes and fatty accumulation, mRNA expression of adiponectin, resistin, PPAR γ , aP2, and intracellular triglyceride (TG) level were analyzed. Haloperidol (HAL), olanzapine (OLA) and quetiapine (QUE) reduced TG level in adipocytes to 50% ($p<0.05$), 34% ($p<0.01$) and 64% (N.S.), respectively. Troglitazone (TRO), a positive control, increased that to 167% ($p<0.01$) compared to that of control. The mRNA expression of adiponectin, resistin, PPAR γ and aP2 were strongly inhibited by HAL, OLA and QUE, but induced by TRO. Our results suggest that atypical antipsychotic drug might cause the increase of insulin resistance due to the inhibition of mRNA expression of adiponectin. The aP2 mRNA expression was significantly inhibited, suggesting 3T3-L1 cells might not differentiate normally due to some abnormality in the differentiation process but not enlargement of adipocytes.

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