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Antihyperglycemic and behavioral effects of mianserin on streptozotocin diabetic rats

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Central nervous system (CNS) complications of *Diabetes mellitus* (DM) have been come into prominence in recent years (Li and Sima, 2004). Studies related to the CNS complications of DM have shown that incidence of depression and anxiety in diabetic patients is higher than general population (Lustman and Clouse, 2005). On the other hand, several antidepressant drugs using for the treatment of emotional disorders such as maprotiline, fluoxetine, desipramine, duloxetine, venlafaxine and phenelzine have been reported for their effects on glycemic control (McIntyre *et al.,* 2006). In addition, long term treatment with antidepressant drugs has been shown to be correlated with high incidence of DM (Kivimäki *et al.,* 2010). Therefore, it is quite important to prefer most appropriate drug for the treatment of DM-induced emotional disorders. Mianserin, an atypical antidepressant drug, has been widely prescribed in last years. Potential effects of this drug on blood glucose levels or DM-induced CNS complications have not been investigated previously. Therefore, in this study, we planned to investigate the probable effects of mianserin on blood glucose levels and behavioural changes arising in streptozotocin (STZ) diabetic rats. Diabetes was induced in male Wistar rats (250-300g) by a single intravenous injection of STZ (50 mg/kg). 72 hours after the injection, glucose was determined in blood samples obtained by pricking the tail, using Glukotrend®. Animals with blood glucose levels higher than 300 mg/dL were accepted as diabetic. Four weeks after the induction of diabetes, mianserin (30 mg/kg, *p.o*) was applied to animals during two weeks. Elevated plus-maze (EPM), modified forced swimming (MFST), and activity cage tests were performed for evaluating exploratory behaviours, depression levels, and spontaneous locomotor activities of animals, respectively. Experimental data (n=7, in each group) were analysed by one-way ANOVA followed by Tukey's HSD test. Mianserin significantly ($p<0,05$) decreased high blood glucose levels of diabetic animals. In MFST, drug administrations shortened the long immobility times ($p<0,001$) of diabetic animals while increasing their short active behaviour durations ($p<0,05$). Impaired anxiety parameters of diabetic rats were also improved in EPM tests ($p<0,05$). Based on these findings, it may be suggested that mianserin may help to diabetic patients suffer from DM-induced emotional disorders by its antihyperglycemic, antidepressant and anxiolytic effects.

References:

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