Disfunction of the dopamine-prolactin axis in the development of NAFLD.

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Background. NAFLD is currently recognized as the hepatic manifestation of metabolic syndrome and is the leading cause of liver-related morbidity and mortality. Risk factors for NAFLD include obesity, diabetes, insulin resistance, and hypertriglyceridemia [1]. These studies suggest that endocrine dysfunction may play an important role in the development, progression, and severity of NAFLD [2,3,4,5]. Chronic prolactin excess is associated with increased food intake and weight gain, leading to obesity [6,7]. This is due to the functional blockade of dopaminergic tone caused by hyperprolactinemia. Abnormal lipid profile is a common feature in patients with prolactin excess. Physiologically, dopaminergic tone plays a key role in reducing food intake and increasing energy expenditure, which supports the hypothesis of dopamine involvement in body weight regulation [8]. Preclinical studies using rats with hyperprolactinemia showed that dopamine reduction led to obesity.

Purpose: To critically summarize experimental and clinical data on dopamine in the development of steatohepatosis.

Materials and methods: The experiments were conducted on 120 white rats weighing 160-200 g. Fatty liver disease is modeled by a high-fat diet. During the study, the animals were divided into 4 groups: 1st - intact (healthy), 2nd - rats receiving a high-fat diet and called a model of fatty hepatosis for 14, 18, 20 weeks. An ELISA blood test was performed to determine prolactin and dopamine levels. Results: The mean serum prolactin levels (+/- SEM) were 39.715+/- 0.001 and 5.46+/- 0.001 ng/mL in the NAFL group and control group, respectively. The mean serum prolactin level in the NAFL group was significantly higher than that in the control group. The mean serum dopamine levels (+/- SEM) were 10.28+/- 0.001 and 71.708+/- 0.001 ng/mL in the NAFL group and control group, respectively. The mean serum dopamine level in the NAFL group was significantly lower in the NAFL group than in the control group. There was a significant correlation between obesity and serum prolactin and dopamine levels when all subjects were assessed together (NAFL and control group, r = 0.337, p = 0.012). Of the predisposing factors for NAFL, obesity was observed in 44% of rats and hyperlipidemia in 67%. Serum cholesterol and triglyceride levels were significantly higher in the NAFL

group than in the control group ($p < 0.05$). It was found that in the rats consuming a large amount of fat, it was significantly lower than in the control group.

Conclusions. Serum dopamine levels were significantly lower and prolactin levels were higher in patients with NAFL. This decrease was disproportionate to serum triglyceride levels, cholesterol, and in most cases may be associated with hyperlipidemia. Especially increased levels of total cholesterol, LDL and triglycerides and decreased HDL levels were more often observed in patients with hyperprolactinemia compared to healthy control subjects. Increased prolactin levels were observed with decreased dopamine levels. Thus, a direct correlation between prolactin levels and lipid fractions and a correlation between dopamine and prolactin levels was hypothesized. Thus, decreased dopamine levels increase serum prolactin levels, which may contribute to the development of hepatic steatosis.

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