

## Original Paper

# Effect of gestational diabetes on astrocyte density in CA1 and CA3 subfields of hippocampus in Rat offspring

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## Abstract

**Background and Objective:** Diabetes mellitus is one of the most common serious metabolic disorders characterized by hyperglycemia, altered metabolism of lipids, carbohydrates and proteins. Gestational diabetes mellitus (GDM), affects 3.5–5% of all human pregnancy. Therefore, this study was done to evaluate the effect of gestational diabetes on astrocyte density in CA1 and CA3 subfields of hippocampus in rat male offspring.

**Materials and Methods:** In this experimental study, 12 Wistar Dams rats were randomly allocated in control and diabetic groups. Gestational diabetes induced by 40 mg/kg/body weight of streptozotocin at the first day of gestation (GD) in experimental group and controls were received an equivalent volume normal saline injection intraperitoneally (IP). Six male offspring of cases and controls dams, at the 7, 21 postnatal day (P7, P21) were randomly selected. Animals were scarified using chloroform anesthesia. The coronal sections of brain by 6 micrometer serially were prepared. The sections were stained with PTAH. The number of astrocytes was evaluated in 100000  $\mu\text{m}^2$  area of CA1 and CA3 in 1000X magnification. Data was analyzed by SPSS-11.5 and t-test.

**Results:** In CA1 subfield of hippocampus in offspring, the number of astrocytes significantly reduced by 36.25% and 36.37% in diabetic group in compare to controls in the P7 and P21, respectively ( $P < 0.05$ ). In CA3, astrocytes density significantly reduced 36.35% and 26.5% in GD in comparison with controls in the P7 and P21, respectively ( $P < 0.05$ ).

**Conclusion:** This study showed that the uncontrol gestational diabetes significantly reduces astrocytes density in CA1 and CA3 subfields of hippocampus in rat offspring.

**Keywords:** Gestational diabetes, Astrocyte, Hippocampus, Streptozotocin, Rat

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