

Original Paper

Gestational diabetes reduces motor neurons of spinal cord in 4, 8 and 12 weeks rat offspring

Golalipour MJ (Ph.D)^{*1}, Ghafari S (B.Sc)², Moharreri AR (M.Sc)³

¹Professor, Gorgan Congenital Malformations Research Center, Department of Anatomical Sciences, Golestan University of Medical Sciences, Gorgan, Iran. ²BSc in Biology, Department of Anatomical Sciences, Golestan University of Medical Sciences, Gorgan, Iran. ³Academic Instructor, Department of Anatomical Sciences, Golestan University of Medical Sciences, Gorgan, Iran.

Abstract

Background and Objective: Previous studies have shown the adverse effects of gestational diabetes on hippocampal neuron density in animal model. This study was conducted to determine the effect of gestational diabetes on number of motor neuron in the ventral horns of spinal cord in 4, 8 and 12 weeks rat offspring.

Materials and Methods: In this experimental study, 30 Wistar dams were randomly allocated in control and diabetic groups. Dams in diabetic group were received 40 mg/kg/bw of streptozotocin (STZ) at the first day of gestational day (GD) and control group were received an equivalent volume normal saline, intraperitoneally. Six offspring of cases and controls were randomly selected at the 4, 8, 12 postnatal weeks. Postnatal rats were scarified and sections (6 micrometer) were taken from the cervical part of spinal cord, stained by cresyl violet. A photograph of sections was produced using an Olympus BX51 microscope and a DP12 digital camera. The number of motor neurons in the right ventral horns of spinal cord was evaluated in 100000 μm^2 area of spinal cord using OLYSIA Autobioreport software.

Results: The number of motor neurons in 4 weeks rat offspring were reduced (24.90%) in gestational diabetics compared to controls (17.16 \pm 0.5 vs22.85 \pm 2.1, P<0.05). The motor neurons in 8 weeks rat offspring were reduced (32.95%) in gestational diabetics in comparison with controls (17.70 \pm 1.7 vs26.40 \pm 2.0, P<0.05). Also, the number of motor neurons in 12 weeks rat offspring were reduced (24.38%) in gestational diabetics in comparison with controls (17.83 \pm 0.7 vs23.58 \pm 1.4, P<0.05).

Conclusion: The uncontrolled gestational diabetes reduces the number of motor neurons in the ventral horn of spinal cord in rat offspring.

Keywords: Gestational diabetic, Motor neurons, Spinal cord, Rat

* Corresponding Author: Golalipour MJ (Ph.D), E-mail: mjgolalipour@yahoo.com

Received 2 November 2013 Revised 11 January 2014 Accepted 14 January 2014