MUSCIMOL CHANGES HYPOXIA-INDUCED IMPAIRMENT OF BEHAVIOR IN RATS

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Muscimol changes hypoxia-induced impairment of behavior in rats.

Muscimol, a selective agonist of GABA-A receptors, causes changes in behavioral activity. Hypoxia interferes with the GABAergic system and with the functions of GABA-A receptors. We used muscimol in Wistar rats to estimate its influence on locomotor activity in the open field test as well as on the processes of consolidation and retrieval, evaluated in the test of passive conditioned reflexes. Anxiolytic activity was examined in the elevated “plus” maze in physiological state and after hypoxia-induced amnesia. Following intraperitoneal administration of muscimol (1 mg/kg, ip), the animals showed a decrease in motility, in retrieval of skill reflexes and in a number of entries into open and closed arms in the elevated plus “maze”. In animals exposed to hypoxia, we observed reduced motility in the open field, inhibition of retrieval and consolidation of passive conditioned reflexes, shortened time of sojourn in open arms and decreased number of entries into open and closed arms. In the group of animals which underwent hypoxia and then received muscimol, we observed no effect of hypoxia on muscimol activity in the open field test, except rearing when muscimol action was significantly reduced. Muscimol improved consolidation but not retrieval in comparison with the hypoxic saline-treated group of rats. In the elevated “plus” maze test, treatment of rats with muscimol after hypoxia significantly prolonged the time spent in open arms and increased the number of entries into open arms, while shortened the time spent in closed arms. In conclusion, muscimol in hypoxia-exposed group of rats exerted beneficial effect on consolidation in passive avoidance situation and exerted anxiolytic activity. Changes in the activity of muscimol under hypoxia may have significant clinical implications.

Key words: muscimol, hypoxia, behavior, rats