

Effect of Allotransplantation of Embryonic Brain Tissues and Administration of Potentiated Antibodies to Bombesin on Hemodynamics in Rats with Emotional Hypertension

E. V. Veselovskaya and O. I. Epstein

Transcutaneous allotransplantation of embryonic tissues from the anterior hypothalamus and amygdaloid complex and administration of potentiated antibodies to bombesin normalized blood pressure and parameters of ECG in rats with emotional hypertension.

Key Words: *allotransplantation; embryonic brain tissues; potentiated antibodies to bombesin; hemodynamics; emotional hypertension*

Here we studied the effect of transcutaneous allotransplantation of embryonic tissues from the anterior hypothalamus and amygdaloid complex (ETHAC) in combination with administration of potentiated antibodies to bombesin (PAB-B) on hemodynamics in rats with emotional hypertension.

MATERIALS AND METHODS

Experiments were performed on 9 adult male rats weighing 220-250 g. Systolic blood pressure (SBP) was measured on the caudal artery. ECG was recorded in 3 standard leads. Emotional hypertension was produced by a conflict situation in the zoosocial group. Electric current (30-50 V) was applied to limbs for 1 h. Transcutaneous allotransplantation of ETHAC was performed at the C_{III} projection to animals with developed emotional hypertension. PAB-B were administered perorally starting from the 1st day after allotransplantation. SBP and ECG were recorded 13, 23, 35, and 43 days after ETHAC transplantation and treatment with PAB-B and 40 days after PAB-B withdrawal. We estimated heart rate (HR), integral parameter (IP) [2], and strain of heart rhythm (SHR) [1].

The results were analyzed by Student's *t* test.

RESULTS

In animals with emotional hypertension SBP was high, while HR and SHR markedly decreased compared to

the baseline level ($p<0.05$). Changes in IP were insignificant (Table 1).

On day 13 after transplantation of ETHAC and administration of PAB-B, SBP remained high, HR tended to increase ($p>0.1$), and IP significantly increased ($p<0.02$, Table 1).

On day 23, SBP decreased compared to that after stress ($p<0.001$), HR and SHR increased ($p<0.02$), while IP only tended to increase ($p>0.1$, Table 1).

On days 35 and 43, SBP decreased ($p<0.01$), while HR variability did not differ from that observed after the development of emotional hypertension.

SBP significantly decreased ($p<0.001$), while HR increased ($p<0.05$) 40 days after the end of PAB-B administration. IP and SHR did not differ from those observed after emotional stress. These parameters approached the baseline level.

It should be emphasized that rats with emotional hypertension were characterized by the activation of pressor mechanisms regulating SBP and autonomic (parasympathetic) mechanisms controlling the cardiovascular system.

Transcutaneous allotransplantation of ETHAC and administration of PAB-B induced changes in the mechanisms regulating the cardiovascular system. These changes were manifested in activation of the sympathetic and parasympathetic systems. For instance, the depressor effect in the mechanisms regulating SBP (hemodynamic component) was observed on day 23. Then SPB decreased to normal observed in rats of this age. In the mechanisms controlling cardiac function, sympathetic activity increased on days 13 and 23 after allotransplantation and administration of PAB-B. The parasympathetic regulation of hemodynamic parameters prevailed on days 35 and 43 and after withdrawal of PAB-B.

Institute of Neurology, Psychiatry, and Narcology, Ukrainian Academy of Medical Sciences, Kharkov; "Materia Medica Holding" Research-and-Production Company, Moscow

TABLE 1. Parameters of ECG in rats with Emotional Hypertension after Transcutaneous Allotransplantation of ETHAC and Administration of PAB-B ($M \pm m$)

Period of ECG recording	HR, bpm	SHR, arb. units	IP, %	SBP, mm Hg
Baseline level	476.9 \pm 20.1	42.3 \pm 5.9	26.6 \pm 3.6	90
After stress	422.0 \pm 14.5*	25.2 \pm 2.9*	31.3 \pm 3.5	142*
After transplantation and PAB-B administration in stressed rats, days				
13	453.2 \pm 9.3	29.3 \pm 3.7	43.6 \pm 2.9 ⁺⁺	140*
23	466.4 \pm 8.0 ⁺⁺	35.9 \pm 1.5 ⁺	41.1 \pm 3.8	135*
35	423.0 \pm 8.4	30.1 \pm 3.7	41.3 \pm 4.2	128*
43	447.9 \pm 12.8	21.5 \pm 3.1	40.3 \pm 4.0	118*
After PAB-B withdrawal	466.7 \pm 15.1 ⁺⁺⁺	29.8 \pm 1.7	24.3 \pm 5.4	108*

Note. * p $<$ 0.05 compared to baseline level; ⁺ p $<$ 0.001, ⁺⁺ p $<$ 0.02, and ⁺⁺⁺ p $<$ 0.05 compared to the corresponding parameter after stress.

Our results suggest that transcutaneous allotransplantation of ETHAC and administration of PAB-B produce a positive parasympathetic effect on hemodynamic parameters in rats with emotional hypertension.

REFERENCES

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