Experimental Study of the Transplant of Embryonic Septum and Septum-Ceruleus in the Treatment of senile Dementia

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In this paper senile dementia (SD) male rats were divided into four groups: lesioned, with septal transplant, with septal and locus ceruleus transplant and control. Unilateral transection of fornix fimbria (FF) in old (28-32 months) rats was employed in preparing senile dementia (SDAT) animal models. Ten days after operation, embryonic septal cholinergic and septum + locus ceruleus (noradrenergic) transplants were made in a suspension fluid and transplanted into hippocampus on both sides of the injured rats. One months after transplantation it was found that. 1. Lesioned rats in the morris water maze required an average latent period (82.83 seconds) to find the platform as compared with the control group (46.03 seconds). In lesioned group, 120 seconds swimming distance around the original platform was 24.50% of the total distance, while the controlled group was 39.60%. In lesioned group, in 120 seconds the number of times crossing the original platform was 27.29% of the total times, while the control group was 50.70%. In the injured hippocampus, the density of AchE positive fibers in CA1, CA3 and dentate gyrus was 29.23, 27.61 and 25.61 when compared with control group, reduced to 7.78, 10.61 and 12.56 (point of intersection/10,000μm²). 2. Acetylcholine transferase and tyrosine hydroxylase immunohistochemistry showed: cholinergic neurons well developed and integrated with host hippocampus, while NA-ergic neuron survival and development were both limited. 3. In the morris water maze the average latent time required to find the platform in rats with septal transplant was 24.32 seconds. In 120 seconds swimming distance around the platform was 41.74% of the total distance. Number of times crossing the original platform was 47.68% of the total times. At the same time the density of AchE positive fibers CA1, CA3 and dentate gyrus of rats with septal transplant rose to 19.21, 19.27 and 14.85 (point of intersection/10,000μm²) respectively. 4. Septum + local ceruleus transplant rats required latent period of 42.62 seconds to find platform. In 120 seconds the swimming distance around the platform was 35.07% of the total times. The density of AchE fibers in CA1 of the injured hippocampus in rat with composite transplant rose to 10.05 while CA3 and dentate gyrus were 10.74 and 12.16 respectively (point of intersection/10,000μm²) without improvements. The above results indicated that: Unilateral injury of the FF of old rats could obviously affect the learning and memory abilities of old rats. In embryonic septal transplant, the cholinergic neurons were survived and developed, and they could comparatively improve the learning and memory of injured FF, embryonic locus ceruleus together with septum transplant could not improve FF affected learning and memory behavior of old rats.