Analysis of the rectangular apparatus that Asyogh created to evaluate Wistar rats' memory and learning

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Abstract

The goal of this study was to create a better rodent memory assessment tool based on Asyogh's rectangular device. When rats were given scopolamine (3 mg/kg i.p.) plus diazepam (1 mg/kg i.p.), their memory was considerably disrupted, as seen by increased transfer latency times. However, the rats' memory issues vanished when they were given donepezil beforehand. Pretreatment donepezil may effectively repair the memory deficits induced by scopolamine and diazepam, as seen by the significant improvement in TLT. This study showed that the transfer delay time detection device was a useful tool for assessing rats' memory and cognitive abilities.

keywords: Introducing Asyogh's rectangle device—a groundbreaking tool for assessing learning and memory

Introduction:

The brain encodes, stores, and retrieves information as part of the mental process known as memory.The medical word for memory loss is amnesia. Brain damage, disease, or the adverse effects of hypnotics or sedatives are some of the causes of forgetting.Previous studies have shown that the cholinergic system is crucial to living things' cognitive functions.The reduced cholinergic function may be due to memory loss from a structural lesion or an antagonist at the muscarinic and nicotinic receptors [3].[4] According to research on animals, scopolamine, an anticholinergic drug, may alter the cholinergic system and cause amnesia.Five, six Previous studies have shown that diazepam produces amnesia in rats.[7] These days, there are many instruments and little animals.The passive avoidance test is a common technique used to examine how rats' brains interpret unpleasant memories.

References [9,10] In the Morris water maze test, rats became wet and filled with dread; in the passive shock avoidance test, rats learned and remembered things by being shocked. In addition to being unpleasant and excruciating, electric shock made rats fearful and threatened, and it required

a lot of training. To get over these issues, the inventor Asyogh came up with a rectangular gadget that rats may use to induce fear of water and electric shock while also providing memory based on the smell sense of food material.

The Subjects and Procedures

The rectangular device that Asyogh created It has a rectangular shape and measures 42" × 20" × 6". The roof is covered with wire gauge. situated halfway and accessible for evaluating rats' memory. The Morris Water Maze apparatus is used to evaluate people's cognitive capacities. The papers published in this open access journal are made available under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License. This implies that there is no cost associated with using the articles in any form, including remixing and altering them. All they have to do is license their own works under the same conditions and provide due credit.

The point nearest the entry is used to count one, two, three, and four points. The animal enclosure, which serves as housing and a source of food and water, is shown in Figure 1a together with the rectangular devices 1b and 1c, the entrance point (starting point), and the four points (target point).

Animals The room temperature was maintained at around 25°C with a relative humidity of about 65%, and all rats had unrestricted access to food and water. Additionally, twelve hours before to the trial, the rats were fasted. The study was conducted following the guidelines set out by the IAEC at UPUMS in Saifai, Uttar Pradesh, and the committee in charge of monitoring and regulating animal research.

Rats utilised for training were either male or female, 10–12 weeks old, and weighed 60–100 g. Rats were put at the beginning of the contraption and allowed to eat when they reached the finish, where food was waiting for them, after fasting through the night. Rats learnt and recalled the location of food rather often. The five groups of trained rats consisted of six rats apiece.

The control group (Group I) received intraperitoneal injections of 1 ml/kg of a standard salt solution (0.9% NaCl) for 14 days. 30 minutes before to the testing on the fourteenth day, Group II, which received scopolamine treatment, received an intraperitoneal injection of the medication at a dose of 3 mg/kg. An intraperitoneal dose of 1 mg/kg of diazepam was given to the third group thirty minutes before to the testing on the fourteenth day. Group IV: For 14 days, participants in this group received donepezil orally at a dosage of 3 mg/kg each day. Thirty minutes before to the start of testing on day 14, they received scopolamine intraperitoneally at a dose of 3 mg/kg. Group V: received donepezil and diazepam orally (3 mg/kg/day) for 14 days, 30 minutes before to the test, and 1 mg/kg intraperitoneally on the fourteenth day. On the fourteenth day of the experiment, rats' learning memory was assessed using the experimental rectangle equipment that Asyogh had created.
TLT is the amount of time it takes to transport rats from one place to another. An increase

or decrease in the TLT was shown to improve or impair rats' memory and learning capacities, respectively.

Data analysis using statistics

To compare numerous groups, one-way ANOVA was used, and for specific group comparisons, Dunnett's test was utilized. A P-value lower than 0.05 indicates statistical significance in the findings.

Final Product

Rats given scopolamine in Video 1 had a TLT that was 30 seconds longer than that of the control group (5 seconds longer), while rats given donepezil as a pretreatment in Video 4 had a TLT that was 8 seconds longer than that of the control group (Figure 2). There was a statistically significant difference between the two groups ($P < 0.0001$). Rats given diazepam had a TLT that was 20 seconds longer than that of the control group (5 seconds longer) in Video 3, while the pretreatment group that received donepezil recovered 9 seconds quicker than the control group in Video 5 (Figure 3). There was a statistically significant variation in duration ($P < 0.001$).
It is evident from comparing Groups 1 and 2 that the second group—the rats given scopolamine injections—had much greater TLT.The findings demonstrated that the ant cholinergic scopolamine-induced cognitive impairment was significantly alleviated by pretreatment donepezil. It

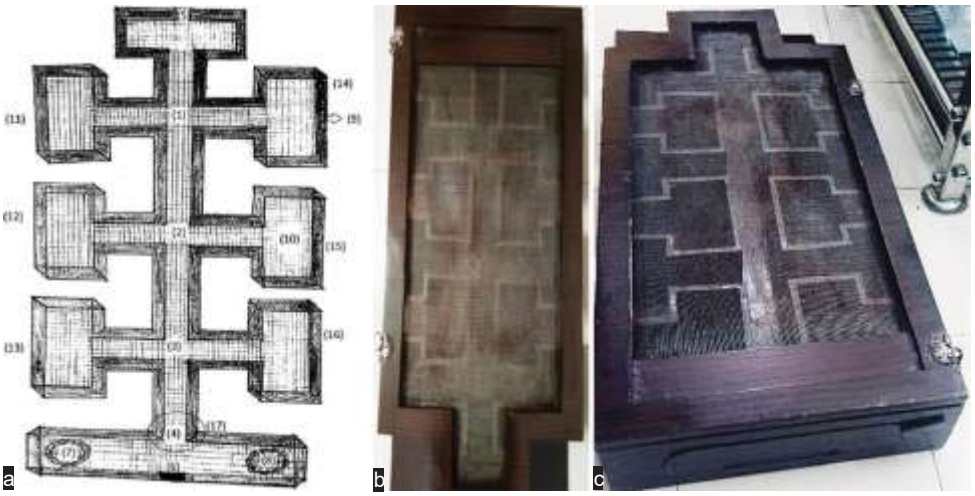
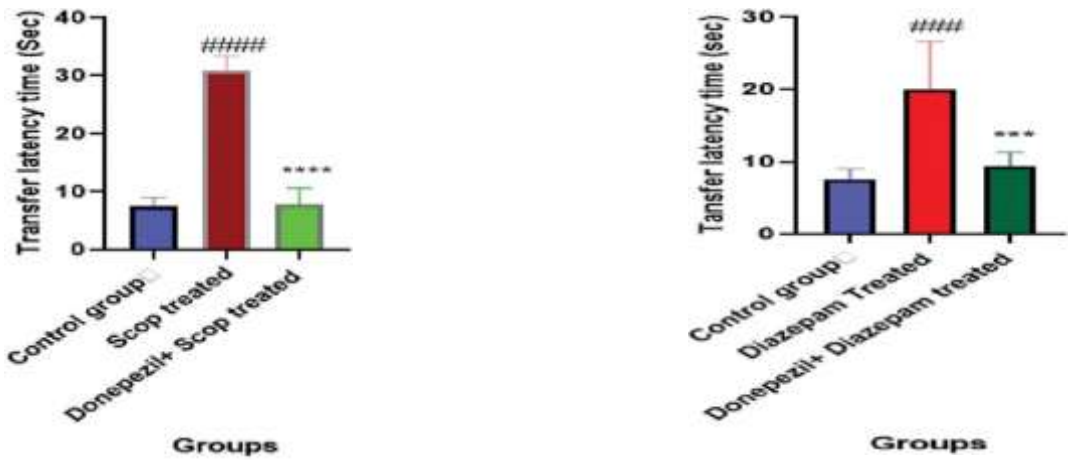


Figure1:(a)DesignofAsyogh'srectangulardevice,fabricatedapparatus(b)Asyoghrectangulardevice,(c) Asyogh'srectangulardevice



Noveldeviceformemorytestingin rats

Figure2: Transferlatencytimeofscopolamineandpretreateddonepezilusingnovel Asyogh's rectangular device test. Results showed means ± standard error ofmean, *n* = 6 in each group. Significant differences ####*P* < 0.0001 compared to thecontrolgroupand****$P<0.0001$comparedwiththescopolamine-treatedgroup

The transfer delay time of donepezil and diazepam was measured using the novel Asyogh's rectangle device test, as seen in Figure 3. Each group included six members, and the findings displayed means ± standard error of mean. There were substantial differences (P < 0.001) between the diazepam-treated group and the control group.shown that donepezil reversed the effects of scopolamine and allowed the rats to return to normal.Previous studies have shown that scopolamine may result in forgetfulness or cognitive impairment.11, 12 Rats treated with diazepam had significantly greater TLT than Group 1, which showed a significant recovery after donepezil pretreatment. The research discovered that rats developed amnesia as a result of the sedative effects of diazepam. Indeed, Zarrindast et al. (2002) discovered that diazepam activated the gamma amino butyric acid receptor in rats, impairing memory.[13]Researchers have previously shown that daizepam may reduce anxiety in rats by impairing cognitive function or producing forgetting.Citations 14 and 15The capacity of pretreatment donepezil to block acetyl cholinesterase activity in the brain is probably what causes the rats' better memory. As a result, acetylcholine is kept from breaking down, increasing its concentration at synapses and enhancing cholinergic activity, which eventually helps rats' cognitive abilities. The present study's findings demonstrated the effectiveness of Asyogh's rectangular device as a memory test in rats. This device could be the best choice for assessing cognitive abilities in rats because to its rodent-friendly design, natural ventilation, and TLT foundation.

In summary

The findings demonstrate the effectiveness of Asyogh's rectangle apparatus in assessing rat memory and learning. Furthermore, it suggests that this device may be used to effectively

evaluate how medications affect memory improvement. It may potentially be used in future research to test for antianxiety drugs.

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