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ORIGINAL RESEARCH

02. Evaluation of Anxiolytic Effect of Pantoprazole on Swiss Albino Mice – An Experimental Study

Farheen Kooliyattayil[1], Shwetha Oommen[1], Jacob Abraham[1]

[1] Pondicherry Institute of Medical Sciences, Puducherry, India

https://www.youtube.com/watch?v=4rJ3DHWeKRs&list=PLhqNq3xJClbafO0Y5bvBcgMmXpgzJxd44&index=6&t=3532s

Background: Anxiety disorders, affecting over 7% of the global population, are among the most common psychiatric disorders significantly impairing daily life, productivity, and social functioning. Current treatments, such as SSRIs and benzodiazepines, provide only partial relief and are often limited by side effects including sedation, sexual dysfunction, and dependence. This has created a pressing need for safer and more effective therapeutic options. Pantoprazole, a commonly used proton pump inhibitor, has demonstrated neuroprotective and anti-inflammatory properties in preclinical studies. These findings raise the possibility that pantoprazole may also exert anxiolytic effects, which have not yet been systematically explored.

Methods: Thirty female Swiss albino mice were divided into five groups, each consisting of 6 animals each- control (saline), standard (diazepam 5 mg/kg i.p.), and pantoprazole-treated groups (10, 15, 20 mg/kg orally). Drugs were administered daily for 14 days. Mice were then assessed using the Elevated Plus Maze (EPM) which measures time spent and entries into open arms, and Actophotometer which records locomotor activity to determine whether pantoprazole produced sedative effects.

Results: Pantoprazole treatment significantly reduced anxiety-like behavior in a dose-dependent manner. In the EPM, mice treated with pantoprazole spent more time and made more entries into open arms compared to controls, with the 20 mg/kg dose producing the strongest effect ($p<0.001$), comparable to diazepam. Importantly, locomotor activity remained unchanged across pantoprazole groups, indicating that its anxiolytic effect was not confounded by sedation. Statistical analysis confirmed that the 20 mg/kg dose of pantoprazole produced significant improvements in anxiety-related measures without altering overall activity levels.

Conclusion: This experimental study provides the first evidence that pantoprazole, at higher doses, exerts significant anxiolytic effects in Swiss albino mice. Unlike diazepam, pantoprazole did not reduce locomotor activity, suggesting a favorable safety profile without sedative side effects. These results highlight pantoprazole's potential as a novel or adjunctive therapeutic agent for anxiety disorders. While further mechanistic studies and clinical trials are required, the findings open an exciting avenue for repurposing an established and well-tolerated drug in the management of anxiety.

Table 1. Effects of Pantoprazole on Anxiety-Like Behavior in the Elevated Plus Maze and Locomotor Activity

Group	EPM: Time in Open Arms (sec)	EPM: Open Arm Entries	Locomotor Activity (Counts)
Control (Saline)	89.00 ± 14.07	3.67 ± 1.15	241.67 ± 35.13
Diazepam 5 mg/kg (i.p.)	213.17 ± 29.93	10.33 ± 2.08	295.17 ± 28.07**
Pantoprazole 10 mg/kg (p.o.)	121.83 ± 16.53	5.83 ± 1.47*	228.33 ± 25.75 (ns)
Pantoprazole 15 mg/kg (p.o.)	131.67 ± 13.79	7.50 ± 1.87	216.17 ± 28.28 (ns)
Pantoprazole 20 mg/kg (p.o.)	155.67 ± 22.44	8.17 ± 1.60	225.83 ± 29.45 (ns)

Legend: Values are expressed as mean ± SEM (n = 6 per group). Statistical significance was analyzed against control group: *p < 0.05, **p < 0.01, **p < 0.001; ns = not significant.

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