Effects of Cycloleucine in the Nucleus Accumbens Septi on the Elevated plus Maze Test in Rats

By: Gargiulo, API (Gargiulo, Augusto P. I.)[1]; Acuna, A (Acuna, Andres)[1]; Gargiulo, MML (Gargiulo, Mercedes M. L.)[1]; Gargiulo, AJM (Gargiulo, Angel J. M.)[1]; Gargiulo, MCJ (Gargiulo, Marcos C. J.)[1]; Baiardi, GC (Baiardi, Gustavo C.)[2]; Mora, S (Mora, Sergio)[3]; Lafuente, JV (Lafuente, Jose Vicente)[4]; Romanowicz, E (Romanowicz, Esteban)[1]; Landa, AI (Landa, Adriana I.)[1] ...More

NEUROPSYCHOBIOLOGY
Volume: 79
Issue: 3
Pages: 191-197
DOI: 10.1159/000505069
Published: APR 2020
Document Type: Article
View Journal Impact

Abstract

Introduction: In recent years, an important number of studies have emphasized the psychopharmacological actions of cycloleucine (1-aminocyclopentanecarboxylic acid) acting on the NR1 subunit (glycine allosteric site) of NMDA (N-methyl-D-aspartic acid) receptor. We studied the effects of its injection in an anxiety test. Methods: The elevated plus maze test was used. Male rats bilaterally cannulated into the nucleus accumbens septi (NAS) were employed. Rats were divided into 5 groups that received either 1 mu L injections of saline or cycloleucine (0.5, 1, 2, or 4 mu g) 15 min before testing. Results: Time spent in the open arm was significantly increased by cycloleucine treatment with all doses (1 and 2 mu g, $p < 0.05$; 0.5 and 4 mu g, $p < 0.01$), like number of extreme arrivals (0.5 and 1 mu g, $p < 0.05$; 2 mu g, $p < 0.01$; and 4 mu g, $p < 0.001$). Open arm entries were increased by the highest dose only (4 mu g, $p < 0.01$). Discussion/Conclusion: Present results show no difference between all doses in the time spent in the open arm, suggesting an indirect, noncompetitive action of the drug. The increase in extreme arrivals and open arm entries suggests a dose influence in these parameters. We conclude that cycloleucine influence on the NMDA receptors within NAS leads to anxiolytic-like effects and behavioral disinhibition, which once more confirms the involvement of NAS in anxiety processing.

Keywords

Author Keywords: Cycloleucine; NR1 subunit; Accumbens; Anxiety
KeyWords Plus:GLUTAMATERGIC BLOCKADE; 1-AMINOCYCLOBUTANE-1-CARBOXYLATE ACBC; SELECTIVE NMDA; LIMBIC SYSTEM; GLYCINE; SCHIZOPHRENIA; ANTAGONIST; INJECTION; ANXIETY; ORGANIZATION

Author Information

Reprint Address: Gargiulo, PA (reprint author)

+ Natl Univ Cuyo, Fac Med Sci, Lab Neurosci & Expt Psychol, Area Pharmacol,Dept Pathol,CONICET, Guaymallen 5519, Argentina.

Addresses:

+ [1] Natl Univ Cuyo, Fac Med Sci, Dept Pathol, Lab Neurosci & Expt Psychol,CONICET, Mendoza, Argentina

+ [2] Catholic Univ Cordoba, Natl Univ Cordoba, Inst Biol & Technol Res IIBYT CONICET, Lab Neuropharmacol,Fac Chem Sci, Cordoba, Argentina

+ [3] Univ Chile, Fac Med, Inst Biomed Sci, Program Mol & Clin Pharmacol, Santiago, Chile

[4] Univ Basque Country UPV EHU Barrio Sarriena, Dept Neurosci, Lab Clin & Expt Neurosci LaNCE, Leioa, Spain

E-mail Addresses:gargiulo@lab.cricyt.edu.ar

Funding

Funding Agency Show details	**Grant Number**
Volkswagen	
First Neuroscience Grant of Latin American Technological Corporation Foundation (Fucotel)	
National University of Cuyo	06/P27-02 06/J491 3820-R/2016 571/2015

View funding text

Publisher

KARGER, ALLSCHWILERSTRASSE 10, CH-4009 BASEL, SWITZERLAND

Journal Information

- **Impact Factor:** Journal Citation Reports

Categories / Classification

Research Areas: Neurosciences & Neurology; Psychiatry; Psychology

Web of Science Categories: Neurosciences; Psychiatry; Psychology

Document Information

Language: English

Accession Number: WOS:000530010400003

PubMed ID: 31927553

ISSN: 0302-282X

eISSN: 1423-0224