Poster #C48

IASP 2024 WORLD CONGRESS ON PAIN
Amsterdam, Netherlands • 5-9 August

Anxio-Depressive Behavior in Preclinical Neuropathic Pain: Systematic Review and Meta-Analysis

T. de la Rosa[1,2,3], M. Llorca-Torralba[1,2,4], A. Martínez-Cortés[1,2,5], C. Romero-Lopez-Alberca[1,2,5],, E. Berrocoso[1,2,3]

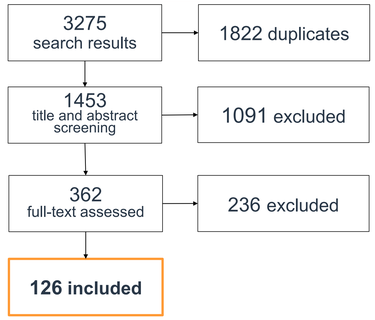
[1]Instituto de Investigación e Innovación Biomédica de Cádiz, INiBICA, Hospital Universitario Puerta del Mar, Cadiz, Spain, [2]Centro de Investigación Biomédica en Red de Salud Mental CIBERSAM, Instituto de Salud Carlos III, Madrid, Spain [3]University of Cadiz, Neuropsychopharmacology and Psychobiology Research Group, Department of Neuroscience, Cadiz, Spain,, [5]University of Cadiz, Department of Cell Biology and Histology, Cadiz, Spain, , [5]University of Cadiz, Department of Psychology, Cadiz, Spain,

INTRODUCTION

Chronic pain and psychiatric disorders comorbidity remains poorly understood[1,2], despite its high prevalence. Basic research with animal models of pain are crucial to this task[3]. However, the diversity of approaches, methodologies, and experimental designs in preclinical research often obstructs reproducibility and translatability[4].

Our meta-analysis aimed to calculate the overall impact of neuropathic pain models on anxiety- and depressive-like behaviors, and to elucidate the modulatory effects of variables such as species, strain, and sex on these behaviors.

METHODS



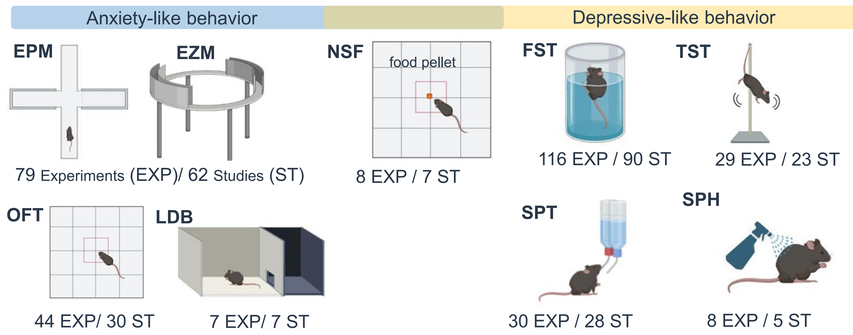
Systematic review was registered on PROSPERO (CRD42022366275) following PRISMA guidelines[5].

Databases: EMBASE, Scopus, and Web of Science

Screening: peer-blinded review of titles and abstracts was performed, followed by a full-text examination.

Extraction: data on bibliographic, population, and methodological variables of the behavioral assays, along with statistical data, were extracted, and the risk of bias was assessed[6].

Analysis: primary random-effects meta-analyses of the eight behavioral outcomes were performed (Hedge's g ±95% CIs). Heterogeneity was estimated and moderator analysis performed to explain it.



RESULTS

Primary Meta-Analysis

Regarding **anxiety-like behavior**, neuropathic pain model significantly reduced time in open arms in EPM/EZM, time in center in OF and reduced latency of feed in the NSF.

Nerve injury increased **depressive-like behavior,** as evidenced by increased immobility time in both FST and TST, as well as reduced sucrose consumption in SPT and grooming in SPH.

Subgroup Analysis

Strain affected anxiety-like behavior in the EPM/EZM and OF tests. **Sex** significantly affected EPM/EZM results, and **species** the OF. **Strain** and **sex** also impacted depressive-like behaviors in FST and TST. (*p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001)

Meta-Regression

Significant effect of the **width of the surgical suture** (mm) on exploratory behavior was observed in EPM/EZM and OF.

Publication Bias

Funnel plot were represented, and Egger regression tests revealed significant publication bias. Black squares correspond to virtual studies included by trim-and-fill analysis.

CONCLUSIONS

This meta-analysis shows that neuropathic pain significantly affects anxiety-like and depressive-like behaviors in rodents. Future research should prioritize investigating sex differences. Ensuring methodological rigor and reporting of diverse experimental conditions will enhance translational relevance and replicability in pain research.

References: (1) Knaster et al (2012), Gen Hosp Psyc (2) Lerman et al (2015), Psychosom Med (3) Bravo et al (2020), Neuro Biobehav Rev (4) Ravenelle et al (2014), Neuroscience (5) Page et al (2021), BMJ (6) Hooijmans et al (2014), BMC Med Res Methodol.

@Berrocoso_lab

This study was supported by grants PID2022-142785OB-I00 and PDC2022-133987-100 funded by MCIN/AEI/ 10.13039/501100011033 and, as appropriate, by "ERDF A way of making Europe", by the "European Union" and "European Union NextGenerationEU/PRTR" respectively, by the Consejeria de Salud de la Junta de Andalucia (PI-0134-2018; No. P20-00958), by the Programa Operativo de Andalucia FEDER, by the Instituto de Investigacion e Innovacion en Ciencias Biomedicas de Cadiz (INiBICA; IN-C09), by the Consejeria de Economia, Innovacion, Ciencia y Empleo de la Junta de Andalucia (CTS-510), by the "CIBERSAM": CIBER - Consorcio Centro de Investigacion Biomedica en Red- (CB07/09/0033), and European Union-NextGenerationEU, Juan de la Cierva grant, financed by the MCIN/AEI /10.13039/501100011033 and NextGenerationEU/PRTR.

Copyright © 2024 Tomás de la Rosa tomas.rosa@uca.es