TOXICOLOGY OF BENZODIAZEPINE USING ZEBRAFISH (*Danio rerio*) AS AN ANIMAL MODEL: RESEARCH TRENDS

Flavia Bernardo Chagas; Aline Pompermaier; Marília Hartmann

Federal University of Fronteira Sul, Erechim, Rio Grande do Sul, Brazil

ABSTRACT

INTRODUCTION: The increasing use of drugs causes significant quantities to reach aquatic ecosystems, which poses potential risks to non-target organisms and human health. Benzodiazepines (BZDs) are among the most prescribed drugs. They are studied as environmental contaminants due to their high consumption, inadequate disposal, and ineffective removal by conventional wastewater treatment processes and persistence in aquatic environments. The zebrafish (*Danio rerio*) is an excellent model for evaluating the toxic effects of environmentally hazardous pollutants. OBJECTIVE: This work consisted of a scientometric review of trends in research on the toxicology of BZDs using zebrafish as a model animal. MATERIAL AND METHODS: The database used for the review was Scopus, the keywords used were toxicology AND "*Danio rerio*" AND benzodiazepine*, and the search was performed in all fields. Only articles published between January 1, 2019, and April 17, 2024, were considered. We obtained 288 records and the analysis of the articles was performed using Bibliometrix and RStudio. RESULTS AND CONCLUSION: The analysis of the context and trends in research demonstrated that to develop a risk assessment system, data on the toxicity of BZDs are needed. Furthermore, current knowledge is limited to studies on specific drugs. The effects of these substances include oxidative stress, bioaccumulation, and neurotoxicity. Knowledge gaps include potential mechanisms of action, behavioral assessments, gene expression, and persistent and transgenerational effects. We emphasize that, based on this analysis, the combined risk of BZDs with other substances and the long-term impact of BZDs on aquatic ecosystems is a concern, even at low concentrations. Our research provides updated data on trends in studies on BZDs in environmental toxicology and contributes to new studies in this area.

Keywords: Aquatic ecosystem; bibliometrix; environmental risk.