

## Molecular Mechanism of the Protective Effect of Tianeptine Against Ketamine-Induced Cardiac Injury in Rats

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**SUMMARY.** Ketamine is a short-acting anesthetic drug that is derived from phencyclidine. Ketamine is used to treat depression and chronic pain disorders, as well as for anesthesia, analgesia, and sedation. Ketamine's sympathomimetic characteristic causes cardiotoxicity. The pathophysiology of ketamine's harmful impact has been linked to reactive oxygen species (ROS) and proinflammatory cytokines such as interleukin 1 beta (IL-1), interleukin 6 (IL-6) and tumor necrosis factor alpha (TNF- $\alpha$ ). Tianeptine is an antidepressant that works similarly to tricyclic antidepressants. According to studies, tianeptine reduces the production of proinflammatory cytokines such as ROS, IL-1, IL-6, and TNF- $\alpha$ . Tianeptine has a sympatholytic action as well. All of this evidence suggests that tianeptine might help to reduce ketamine cardiotoxicity. The goal of our research is to use biochemical and histological techniques to see how tianeptine affects ketamine-induced cardiotoxicity in rats.

**RESUMEN.** La ketamina es un fármaco anestésico de acción corta que se deriva de la fenciclidina. La ketamina se usa para tratar la depresión y los trastornos de dolor crónico, así como para la anestesia, analgesia y sedación. La característica simpaticomimética de la ketamina causa cardiotoxicidad. La fisiopatología del impacto dañino de la ketamina se ha relacionado con especies reactivas de oxígeno (ROS) y citocinas proinflamatorias como la interleucina 1 beta (IL-1), la interleucina 6 (IL-6) y el factor de necrosis tumoral alfa (TNF- $\alpha$ ). La tianeptina es un antidepresivo que funciona de manera similar a los antidepresivos tricíclicos. Según estudios, la tianeptina reduce la producción de citocinas proinflamatorias como ROS, IL-1, IL-6 y TNF- $\alpha$ . La tianeptina también tiene una acción simpaticolítica. Toda esta evidencia sugiere que la tianeptina podría ayudar a reducir la cardiotoxicidad de la ketamina. El objetivo de nuestra investigación es utilizar técnicas bioquímicas e histológicas para ver cómo la tianeptina afecta la cardiotoxicidad inducida por ketamina en ratas.

**KEY WORDS:** cardiotoxicity, ketamine, tianeptine.

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