



Comparing Injectable Anesthesia Regimes of Ketamine-Xylazine, Ketamine-Midazolam, and Inhalation Using Isoflurane in Broiler Chickens to Perform Stereotactic Brain Surgery

Amin Rahdari¹✉, Farshid Hamidi²✉, Samaneh Ghasemi³✉

¹ Graduated from the Faculty of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran

² Department of Basic Sciences, Faculty of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran

³ Department of Clinical Sciences, Faculty of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran

Received: 23 December 2023, Accepted: 26 February 2024

doi [10.22059/jvr.2024.369503.3409](https://doi.org/10.22059/jvr.2024.369503.3409)

Abstract

BACKGROUND: Using broiler chickens as an animal model is common in basic scientific research conducted in the laboratory. In this context, one of the significant challenges in scientific research on birds is administering appropriate anesthesia. Anesthesia in birds carries many risks. To address this issue, medication should be administered based on the physiology and anatomy of birds.

OBJECTIVES: This study aims to compare the effectiveness of injection and inhalation anesthesia methods and drugs in broiler chickens for stereotactic brain surgery to identify the most suitable anesthesia method for birds.

METHODS: The present study was conducted on 36 male broiler chickens of the Ross 308 breed, all 21 days old, with an approximate weight of 750 g. The birds were randomly divided into three groups: group “ketamine-xylazine,” group “ketamine-midazolam,” and group “isoflurane,” with each group containing 12 chickens. In groups “ketamine-xylazine” and “ketamine-midazolam,” the anesthetic was administered intramuscularly (in the pectoralis muscle), while in the group “isoflurane,” it was administered via inhalation. At the end of the study, the duration of induction, maintenance, and recovery from anesthesia was evaluated in different groups.

RESULTS: Our study revealed that injectable anesthetics caused the chickens to exhibit emotional and abnormal movements upon waking up. The induction of anesthesia achieved with two combinations of ketamine-xylazine and ketamine-midazolam took between 2 and 4 minutes, while it took 1 to 2 minutes when combined with isoflurane. Recovery in the first two groups was prolonged, whereas in group “isoflurane,” it was rapid and smooth.

CONCLUSIONS: Analysis of the recorded data and assessment of anesthesia quality in various groups indicated a preference for using isoflurane over other groups evaluated in this study.

Keywords: Broiler chicken, Cerebral stereotaxy, Inhalation anesthesia, Isoflurane, Ketamine

Copyright © Journal of Veterinary Research: Open Access; Copying, distribution and publication are free for full use with attribution. ©The Author(s).

Publisher: University of Tehran

Conflict of interest: The authors declared no conflict of interest.

Corresponding author: Farshid Hamidi, Tel/Fax: +9851-38805599



How to cite this article:

Rahdari A, Hamidi F, Ghasemi S. Comparing Injectable Anesthesia Regimes of Ketamine-Xylazine, Ketamine-Midazolam, and Inhalation Using Isoflurane in Broiler Chickens to Perform Stereotactic Brain Surgery. *J Vet Res*, 2024; 79(2): 81-89. doi: [10.22059/jvr.2024.369503.3409](https://doi.org/10.22059/jvr.2024.369503.3409)

Figure Legends and Table Captions

Table 1. Grading the quality of return from anesthesia (Recovery) in broiler chickens.

Table 2. Quality of return from anesthesia in broiler chickens (n=36).

Figure 1. Using a tracheal tube for the maintenance phase of inhalation anesthesia in broilers.

Figure 2. Comparing mean and standard error of recorded time for the induction of anesthesia in three studied groups of broiler chickens. Different letters indicate significant differences between groups.

Figure 3. Comparing mean and standard error of recorded time for maintaining anesthesia in three studied groups of broiler chickens. Different letters indicate significant differences between groups.

Figure 4. Comparing mean and standard error of recorded time for anesthesia recovery in three studied groups of broiler chickens. Different letters indicate significant differences between groups.