

Comparison of Different Ketamine-Xylazine Combinations for Prolonged Anaesthesia in Budgerigars(*Melopsittacus undulatus*)

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Twenty eight budgerigars of either sex were randomly divided into four groups and injected with ketamine (20, 40, 60 & 80mg/kg respectively) along with xylazine (10mg/kg) intramuscularly. The combination of 80mg/kg of ketamine with xylazine (10mg/kg) was found to produce the longest period (159.43 ± 15.87 min.) of anaesthesia. However, some cataleptic effects of ketamine were also recorded in birds of this group.

KEYWORDS

Xylazine, ketamine, budgerigar, injectable anaesthesia.

INTRODUCTION

Proper general anaesthesia is a prerequisite of all major and minor surgeries in birds. Although inhalation anaesthesia (using isoflurane) is recommended for birds but non availability of a portable anaesthesia unit, especially for the wild birds and its use in field conditions, due to several technical intricacies is impossible [3]. On the other hand, anaesthesia induced and maintained by injectable agents is rapid, cheap and needs less equipment. Several injectable drugs are used in birds. They include barbiturates, chloral hydrate, phenothiazine derivatives, alpha 2-agonists, ketamine and propofol [1,9,10,13]. Ketamine is used only in combination with other agents like alpha 2-agonists to neutralize their individual side effects [2,4,12]. Reports regarding use of this

combination in surgeries where anaesthesia is required for a protracted period are lacking. Therefore, an experiment was designed to study the stages and duration of anaesthesia using different dosages of ketamine with xylazine in budgerigars.

MATERIALS AND METHODS

Twenty eight budgerigars aged four months belonging to both sexes and each weighing 30-35g, were randomly divided into four groups (seven per group). Before induction of anaesthesia all the birds were kept off-feed for one hour only. The induction was accomplished at room temperature in a semi-dark, calm environment. Xylazine (Alfazyne[®], 2%, Woerden, Netherlands) @ 10mg/kg was mixed with Ketamine (10%, Woerden, Netherlands) @ 20, 40, 60 or 80mg/kg and injected into the brachial musculature of birds of group I to IV respectively. The time taken from injection to ataxia, falling and loss of pain reflex was recorded as the induction time. Intervening period till recovery of the pain reflexes was recorded as the maintenance period. The time required for regaining complete consciousness and standing without ataxia was considered as the recovery period. To confirm the loss of pain during the maintenance period, one centimeter longitudinal cutaneous incision was given at the cranial aspect of thigh (under aseptic conditions). Results and data were evaluated by adopting statistical methods of ANOVA (Tukey HSD).

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RESULTS

The values of induction, maintenance and recovery periods from anaesthesia in budgerigars have been presented in table 1.

The time taken for induction in birds of group I was significantly ($P \leq 0.05$) more (85.57 ± 16.06 sec.) than any other group. Although in groups II to IV the values reduced from 44.57 ± 1.51 to 36.85 ± 1.21 sec. yet the differences were non-significant.

General anaesthesia was maintained for the maximum period (159.43 ± 15.87 min.) in budgerigars of group IV. This value was significantly ($P \leq 0.05$) higher when compared to those of the other groups.

The recovery period was significantly ($P \leq 0.05$) longer (60.14 ± 2.12 and 63.43 ± 1.90 min.) in the birds of groups III and IV when compared to those of groups I and II (39.43 ± 1.13 and 42.57 ± 1.40 min.) respectively.

Eye ball movements were noticed throughout in birds of all the groups. All the birds survived during the anaesthetic trial. However, muscular rigidity and convulsions were occasionally observed in birds of group IV.

DISCUSSIONS

In birds subjected to general anaesthesia endotracheal intubation is required to supply oxygen and institute positive pressure ventilation whenever cardiopulmonary emergencies arise. However, in this study tracheal intubation was not attempted in budgerigars as their dry mucosa could hinder the passage of tube and increased resistance to the air flow due to the narrow trachea of this bird was apprehended. The injection site chosen in this study was brachial musculature. Less bleeding was noticed at this site as compared to the femoral muscles in a previous pilot study.

In the birds of group IV high ketamine to xylazine ratio could have resulted in the predominance of ketamine effects (muscular rigidity and convulsions).

Ketamine is the most frequently used general anesthetic agent in birds and experimental animals [3,8].

It has good analgesic property [7,11] but muscle relaxation is poor. To overcome this disadvantage it is generally combined with drugs like xylazine [5,6].

From this study it is concluded that the ketamine (80mg/kg)-xylazine (10 mg/kg) combination can be used effectively and safely in budgerigars for induction and maintenance of prolonged anesthesia (up to 2.5 hours). However, the side effects of ketamine were not completely suppressed by xylazine (@ 10mg/kg).

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Table 1

Mean \pm SD values of induction, maintenance and recovery from anaesthesia using various xylazine-ketamine combinations in the budgerigars.

| Group | Xylazine (10 mg/kg) + Ketamine | Induction (sec) | Maintenance (min) | Recovery (min) |
|-------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| I | 20 mg/kg | 85.57 \pm 16.06 ^a | 32.71 \pm 2.06 ^a | 39.43 \pm 1.13 ^a |
| II | 40 mg/kg | 44.57 \pm 1.51 ^b | 45.14 \pm 5.37 ^a | 42.57 \pm 1.40 ^a |
| III | 60 mg/kg | 42.71 \pm 1.38 ^b | 51.57 \pm 9.02 ^a | 60.14 \pm 2.12 ^b |
| IV | 80 mg/kg | 36.85 \pm 1.21 ^b | 159.43 \pm 15.87 ^b | 63.43 \pm 1.90 ^b |

^{a, b} Values with different superscripts in the same column differ significantly ($P \leq 0.05$).