

Research article

PRELIMINARY STUDIES OVER SEDATIVE AND ANALGESIC EFFECTS OF XYLAZINE, ACEPROMAZINE AND DIAZEPAM IN DUCKS

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ABSTRACT:

The study was conducted to determine the sedative and analgesic effects of xylazine, acepromazine and diazepam on ducks, study was carried out during 2013. The ducks after anesthesia were examined for their body temperature, heart rate, respiratory rate and other parameters related to sedation and analgesia. The results showed that statistically, the differences in the body temperature, heart rate, respiratory rate and other sedative and analgesic parameters of ducks treated with xylazine, acepromazine and diazepam were significant ($P < 0.05$). The average body temperature of ducks treated with xylazine, acepromazine and diazepam was 104.47 ± 1.10 , 105.13 ± 0.77 and $105.71 \pm 1.02^\circ\text{F}$. The average heart rate of ducks anesthetized by xylazine, acepromazine and diazepam observed was 126.20 ± 7.44 , 100.78 ± 5.74 and 111.46 ± 4.22 beats/min. The average respiratory rate of ducks treated with xylazine, acepromazine and diazepam was 21.31 ± 5.23 , 25.42 ± 4.60 and 25.60 ± 3.926 breaths/min. The onset of sedation in ducks anesthetized by xylazine, acepromazine and diazepam was recorded in 3.42 ± 0.16 , 3.46 ± 0.16 and 4.33 ± 0.81 minutes after drug administration. The degree of sedation 4.00 ± 0.89 , 4.50 ± 0.54 and 3.50 ± 0.08 indicated moderate to high degree of sedation. Duration of sedation in the ducks anesthetized with xylazine, acepromazine and diazepam was 67.50 ± 22.90 , 80.80 ± 10.6 and 67.30 ± 15.10 minutes, respectively. In case of duration of analgesia, the duration of analgesia was higher in ducks anaesthetized by Diazepam 11.50 ± 0.80 and 8.37 ± 1.05 minutes by acepromazine with lowest 3.50 ± 0.00 minutes noted by xylazine. The recovery of ducks from anesthesia was recorded in 51.00 ± 7.21 , 49.80 ± 4.02 and 32.10 ± 11.1 minutes, when anesthetized with xylazine, acepromazine and diazepam. The onset of sedation, onset of analgesia, duration of analgesia was relatively delayed; achieving moderate degree of sedation and early recovery was observed in ducks anesthetized with Diazepam. **Copyright © AJPPS, all rights reserved.**

Key words: Xylazine, Acepromazine, Diazepam, Anaesthetize, Ducks.

INTRODUCTION:

The peoples of Pakistan mostly are engaged in agricultural crops, live stocks, pesticides companies and drug factories (Sahito, 2013a). In national economy, the agriculture and livestock play an imperative role for growth of its economy (Sahito, 2013b) in which about 35 million rural populations are engaged. The rural women depended over agriculture, poultry or ducks farming. The ducks are very delicate birds and any mishandling can lead to immediate shock and death. So the administration is much important for the success of surgical point of view with the right choice of anesthesia to save the duck if it is much injured. Anesthetics are administered either gaseous or injectable but here in Pakistan mostly it is used as injection method preferred for the birds. Terrell *et al.*, (2006) compared the anesthetic effect in sixteen captive and wild-caught parrot birds, seven juveniles and nine adults successfully anesthetized multiple times with an intramuscular with medetomidine ketamine combination. Drug dosage differences appeared to be related to metabolic differences between the two size classes into metabolic scaling as a method of calculating anesthetic dosages. Tranquilli *et al.*, (2007) assessed the effects of 5 anesthetic drug combinations in parrot birds with ketamine, xylazine, Telazol, Telazol, detomidine, Telazol, detomidine by 5 min. All birds stood unassisted 30 min after signs of arousal. Eyarefe and Oguntoye, (2012) investigated the anaesthetic effects of intramuscular injection of Ketamine and Lignocaine infiltration in 12 layer chickens (1.1±0.06 Kg). They concluded that in the absence of inhalatory anaesthesia, low dose ketamine and lignocaine infiltration might be a preferred anaesthetic protocol for non-protracted abdominal procedures such as laparo caeectomy in birds.

Xylazine (20mg/ml) is a potent hypnotic with powerful central muscular relaxant properties. Xylazine, detomidine and medetomidine are usually used with combination with ketamine. Hamm *et al.*, (1995) studied the sedative and antinociceptive effects of xylazine and detomidine and concluded that the two agents cause sedation, but that only detomidine has analgesic properties, but xylazine possesses antinociceptive effects (Slater, 1993). Acepromazine is frequently used in animals as a sedative and antiemetic. Acepromazine maleate is used in veterinary medicine in dogs and cats. It can cause hypotension. In addition, acepromazine seems to make it easier for dogs with seizure disorders to have a seizure. This medication should not be used near the time of dipping or treatment with organophosphates for flea control (Forney, 2007).

Diazepam mostly used to treat anxiety, panic attacks, insomnia, seizures, muscle spasms, restless legs syndrome, alcohol withdrawal, benzodiazepine withdrawal, opiate withdrawal syndrome and Meniere's disease. It may also be used before certain medical procedures to reduce tension and anxiety and in some surgical procedures to induce amnesia. The pharmacological action of diazepam enhances the effect of the neurotransmitter (Laweighon *et al.*, 1996). Lumeij and Deenik (2006) compared the effects of medetomidine ketamine and diazepam ketamine as injectable anesthetic combinations. Kentaro *et al.*, (2008) studied the effects of diazepam and chlorpromazine on response suppression in a social situation. Although chlorpromazine generally reduced response rate in all groups, diazepam selectively abolished the response suppression. Javdani *et al.*, (2011) studied twelve healthy parrot birds received xylazine – ketamine regimen and diazepam – ketamine regimen (2 mg/kg and 80 mg/kg). The effects of

each combination on heart rate, respiratory rate, cloacal temperature and the foot web pinch response with the time of induction, maintenance and recovery period of anesthesia were recorded. The aim of study is to determine cardiopulmonary, sedative and analgesic effect of xylazine, acepromazine and diazepam administered IM in ducks.

MATERIALS AND METHODS:

For study six adult and healthy ducks of female sex was purchased from a local market of Hyderabad, Sindh Pakistan. Birds were kept in cages and brought at the animal house before two weeks the commencement of trials in department of Surgery and Obstetrics, Faculty of Animal Husbandry & Vet: Science, Sindh Agriculture University Tandojam, all birds were physically examined. Acepromazine, xylazine and diazepam was administered intramuscularly in thigh muscle of each bird. Water and feed of birds were withheld for 30 minutes and before the administration of drugs normal physiological parameters were recorded. Birds were divided into three groups named A, B and C as shown in experimental design.

Before starting the experiment, each bird was weighted on scale the injection site was disinfected with 70% alcohol, acepromazine, xylazine and diazepam injections was administered (IM) at the thigh muscle of the ducks by disposable syring and the results were analyzed. Drug administration protocol in 3 groups A with each 2 females of duck were kept under observation those treated with xylazine 2.5 mg/kg dose in group B, acepromazine 0.25 mg/kg and group C diazepam 2.5 mg/kg, respectively. Observations were recorded on body temperature, heart rate, respiration rate, sedative parameters (onset of sedation, degree of sedation, duration of sedation, and recovery from sedation). Analgesic parameters (onset of analgesia, degree of analgesia, duration of analgesia, and recovery from sedation) were observed. Other observations (blinking of eyes, lifting of head, neck movement, wing flapping, salivation, defecation) also kept under experiment. The data was presented in (mean \pm SD), analysis of variance was applied to compare the significant difference between drugs and time interval using computerized statistical package SPSS- 11.5 (SPSS, 2000).

RESULTS:

Anesthesia traditionally meant the condition of having sensation (including the feeling of pain) blocked or temporarily taken away. It is a pharmacologically induced and reversible state of amnesia, analgesia, loss of responsiveness, loss of skeletal muscle reflexes, decreased stress response, or all of these simultaneously. These effects can be obtained from a single drug which alone provides the correct combination of effects, or occasionally a combination of drugs to achieve very specific combinations of results. The present study was carried out to determine the sedative and analgesic effects of xylazine, acepromazine and diazepam on ducks. The ducks after anesthesia were examined for their body temperature, heart rate, respiratory rate and other parameters related to sedation and analgesia.

Body temperature (⁰F)

The data in regards to the body temperature of ducks as affected by anesthetic treatment of xylazine, acepromazine and diazepam is presented in Table-1; which indicated that normal body temperature was 105.30±0.88, 105.83±0.45 and 106.66±0.53⁰F. After five minutes the body temperature of ducks treated with xylazine, acepromazine and diazepam was 105.58±0.88, 104.67±0.39 and 106.28±0.49⁰F, respectively. In xylazine, acepromazine and diazepam treated ducks the body temperature ranged between 101.63±0.25 to 105.58±0.10, 103.58±0.74 to 106.30±0.36 and 103.37±0.62 to 106.75±0.32⁰F, respectively. Apart from the anesthetic drugs, the body temperature of the ducks decreased with administration of the drugs; and ducks anesthetized by xylazine reached to the baseline value after 45 minutes of treatment, body temperature of acepromazine treated ducks did not show a major change over baseline temperature and the body temperature in diazepam treated ducks also reflected to change in the body temperature. The body temperature in xylazine treated ducks was decreased more than acepromazine and diazepam treated ducks. Statistically, the differences in the body temperature of ducks treated with xylazine, acepromazine and diazepam were significant (P<0.05).

Table- 1: Body temperature (⁰F) of ducks affected by xylazine, acepromazine and diazepam

Time (minutes)	Xylazine Mean±SD	Acepromazine Mean±SD	Diazepam Mean±SD
Control	105.30±0.88	105.83±0.45	106.66±0.53
5	105.58±0.10*	104.67±0.39*	106.28±0.49*
10	105.28±0.66*	105.63±0.82*	106.03±0.53*
15	101.63±0.25**	105.50±0.65*	105.70±0.44*
20	104.77±0.36*	105.67±0.75*	105.67±0.82*
25	104.08±0.44*	105.00±0.62*	106.08±0.36*
30	103.48±0.55**	105.17±0.58*	106.08±0.11*
35	103.17±0.88**	105.67±0.89*	106.23±0.28*
40	103.63±0.99**	106.30±0.36*	106.75±0.32
45	105.42±0.10	105.73±0.44	106.70±0.52
50	104.47±0.45*	105.73±0.52	106.42±0.36*
55	104.88±0.32*	105.53±0.62*	106.75±0.82
60	105.18±0.15	103.58±0.74**	104.80±0.66**

65	105.47±0.25	103.90±0.92**	103.93±0.49**
70	105.35±0.55	104.23±0.36*	103.37±0.62**
75	104.78±0.82*	104.73±0.85*	104.87±0.32**

* Significantly difference (P>0.05) from corresponding control values.

** Highly significantly difference (P>0.05) from corresponding control values.

Heart rate (beats/minute)

The results pertaining to the heart rate of ducks as affected by various anesthetic drugs including xylazine, acepromazine and diazepam are shown in Table-2, which showed that normal heart rate 135.66±7.66, 110.83±5.88 and 102.50±6.30 beats/minute. After five minutes of anesthetic treatment with xylazine, acepromazine and diazepam, the heart rate of ducks in respective groups was 134.33±8.55, 98.83±6.22 and 106.83±5.12 beats/minute, respectively. In xylazine, acepromazine and diazepam treated ducks the heart rate ranged between 104.17±6.10 to 134.33±8.55, 90.17±6.22 to 110.17±7.52 and 105.17±7.20 to 116.50±6.10 beats/minute, respectively. Irrespective of anesthetic drugs, the heart rate of the ducks followed non-linear trend after treatment with anesthetic agents. Ducks anesthetized by xylazine did not reach to the baseline value even after 75 minutes of treatment. While the heart rate of ducks treated with acepromazine remained constantly lower upto 35 minutes of treatment and later increased considerably and following increasing upto the end of experiment. The ducks receiving anesthesia by diazepam reflected inconsistent heart rate throughout the experimental process. The heart rate on average in acepromazine treated ducks was significantly lower than those anesthetized by diazepam and acepromazine. Statistically, the differences in the heart rate of ducks treated with xylazine, acepromazine and diazepam were significant (P<0.05).

Table 2: Heart rate (beats/minute) of ducks affected by xylazine, acepromazine and diazepam

Time (minutes)	Xylazine Mean±SD	Acepromazine Mean±SD	Diazepam Mean±SD
Control	135.66±7.66	110.83±5.88	102.50±6.30
5	134.33±8.55*	98.83±6.22**	106.83±5.12**
10	130.83±6.10**	93.83±4.10**	111.17±4.88**
15	130.33±5.23**	97.50±7.50**	118.00±6.33**
20	127.33±6.99**	90.17±6.22**	107.17±8.10**
25	122.83±5.29**	95.67±5.10**	109.33±5.20**
30	104.17±6.10**	98.83±6.15**	106.67±6.50**

35	121.83±7.50**	96.50±7.88**	105.17±7.20**
40	119.17±6.15**	101.67±5.23**	106.83±4.25**
45	123.33±5.10**	101.50±4.58**	111.50±4.66**
50	128.33±7.50**	102.67±8.15**	113.33±8.10**
55	128.83±6.22**	107.50±6.33**	113.67±5.66**
60	127.83±4.22**	107.17±5.10**	114.17±9.10**
65	131.00±5.10*	108.50±8.56*	115.83±5.50**
70	132.83±7.15*	101.33±6.25**	116.50±6.10**
75	130.17±5.10**	110.17±7.52*	115.83±4.56**

* Significantly difference (P>0.05) from corresponding control values.

** Highly significantly difference (P>0.05) from corresponding control values.

Respiratory rate (breaths/minute)

In regard to respiratory rate, the results on this parameter of ducks affected by xylazine, acepromazine and diazepam are indicated in Table-3, which indicated that normal respiratory rate 24.16±11.10, 30.50±9.66 and 43.00±8.77 breaths/minute. After five minutes of anesthetic treatment with xylazine, acepromazine and diazepam, the respiratory rate of ducks was 25.00±11.56, 24.00±6.25 and 20.00±9.64 breaths/minute, respectively. In xylazine, acepromazine and diazepam treated ducks the respiratory rate ranged between 15.16±8.10 to 35.00±8.88, 19.00±7.63 to 33.66±6.88 and 19.83±8.25 to 31.50±4.86 breaths/minute, respectively. Regardless the anesthetic drugs, the respiratory rate of the ducks decreased markedly with administration of the drugs. Ducks anesthetized by xylazine reached after 75 minutes of treatment. The respiratory rate of acepromazine decreased initially and reached baseline value after 30 minutes of treatment. The respiratory rate of diazepam treated ducks was lower initially and then increased considerably and sustained increasing upto the end of experiment. The respiratory rate on average in xylazine treated ducks was significantly lower than those anesthetized by acepromazine and diazepam. Statistically, the differences in the respiratory rate of ducks treated with xylazine, acepromazine and diazepam were significant (P<0.05).

Table- 3: Respiratory rate (breaths/min) of ducks affected by xylazine, acepromazine and diazepam

Time (minutes)	Xylazine	Acepromazine	Diazepam
	Mean±SD	Mean±SD	Mean±SD

Control	24.16±11.10	30.50±9.66	43.00±8.77
5	25.00±11.56*	24.00±8.22**	20.00±9.64**
10	23.00±10.55*	22.00±6.35**	19.83±8.25**
15	19.16±6.88**	19.00±7.63**	23.00±9.72**
20	35.00±8.88**	20.33±8.99**	24.16±10.25**
25	16.16±10.40**	20.50±6.83**	21.16±11.30**
30	16.00±9.55**	24.83±7.25**	22.16±14.85**
35	15.16±8.10**	23.66±6.30**	25.00±16.52**
40	15.16±6.30**	24.50±8.18**	25.33±6.82**
45	18.66±7.66**	24.00±6.21**	25.33±7.32**
50	18.66±8.10**	24.00±5.30**	28.33±6.14**
55	21.66±6.15*	30.00±6.11	28.00±5.88**
60	23.16±6.10*	32.16±7.55*	31.00±8.90**
65	24.16±8.80*	33.66±6.88*	31.50±4.86**
70	24.00±6.25*	32.33±9.25*	29.83±5.32**
75	24.83±4.50*	26.33±6.30**	29.50±7.25**

* Significantly difference ($P>0.05$) from corresponding control values.

** Highly significantly difference ($P>0.05$) from corresponding control values.

Sedative effects of xylazine, acepromazine and diazepam

The results in relation to sedative effects of xylazine, acepromazine and diazepam on anesthetized ducks are shown in Table-4 which suggested that the onset of sedation in ducks anesthetized by xylazine, acepromazine and diazepam was recorded in 3.42 ± 0.16 , 3.46 ± 0.16 and 4.33 ± 0.81 minutes after drug administration. The degree of sedation 4.00 ± 0.89 , 3.50 ± 0.54 and 3.50 ± 0.08 indicates moderate to high degree of sedation, respectively. The duration of sedation in the ducks anesthetized with xylazine, acepromazine and diazepam was 67.50 ± 22.90 , 80.80 ± 10.6 and 67.30 ± 15.10 minutes, respectively. The recovery of ducks from sedation was recorded in 70.00 ± 8.66 , 83.40 ± 4.55 and 70.44 ± 9.10 minutes, when anesthetized with xylazine, acepromazine and diazepam, respectively. The onset of sedation was relatively delay, achieving moderate degree of sedation and early recovery was observed in ducks anesthetized with diazepam.

Table- 4: Sedative effects of xylazine, acepromazine and diazepam in ducks ducks

Parameters	Drugs		
	Xylazine Mean±SD	Acepromazine Mean±SD	Diazepam Mean±SD
Onset of sedation (minutes)	3.42±0.16	3.46±0.16	4.33±0.81
Degree of sedation	4.00±0.89	3.50±0.54	3.50±0.08
Duration of sedation (minutes)	67.5±22.9	80.80±10.6	67.3±15.1
Recovery from sedation (minutes)	70.50±8.66	83.40±4.55	70.44±9.10

Analgesic effects of xylazine, acepromazine and diazepam

The results in relation to analgesic effects of xylazine, acepromazine and diazepam on anesthetized ducks are shown in Table-5 which suggested that the no onset of analgesia in ducks anesthetized by xylazine. While, onset of analgesia in ducks anesthetized by acepromazine and diazepam was recorded in 3.50±0.20, 9.33±1.50 minutes after drug administration. The degree of analgesia 4.00±0.89, 3.50±0.54 and 3.50±0.08 indicated moderate to high degree of analgesia, respectively. The duration of analgesia in the ducks anesthetized with xylazine, acepromazine and diazepam was 3.50±0.00, 8.33±1.05 and 12.50±11.10 minutes, respectively. The recovery of ducks from analgesia was recorded in 4.50±7.21, 9.80±4.02 and 12.50±11.10 minutes, when anesthetized with xylazine, acepromazine and diazepam, respectively.

Table- 5: Analgesic effects of xylazine, acepromazine and diazepam in ducks

Parameters	Drugs		
	Xylazine Mean±SD	Acepromazine Mean±SD	Diazepam Mean±SD
Onset of analgesia (minutes)	0.00±0.00	3.50±0.20	9.33±1.50
Degree of analgesia	4.00±0.89	3.50±0.54	3.50±0.08
Duration of analgesia (minutes)	3.50±0.00	8.33±1.05	11.50±0.80
Recovery from analgesia (minutes)	4.5±7.21	9.80±4.02	12.50±11.10

Other observations

The data in regards to other observations are presented in Table-6, which indicated the anesthetic effects such as blinking of eyes, lifting of head, neck movement, wing flapping, salivation and defecation in treated ducks. The results show that blinking of eyes was examined in 03, 02 and 05 ducks after administration of xylazine, acepromazine and diazepam, respectively. While lifting of head was present in 04 ducks after administration of xylazine and acepromazine; incase of diazepam lifting of head was absent. Neck movement was observed in 02, 06 and 04 ducks, wing flapping was found in 06 ducks, salivation was observed in 03, 06 and 06 ducks and defecation was examined in 01 ducks after administration of xylazine, acepromazine and diazepam, respectively.

Table- 6: Physiological observations of ducks along with drugs

Observations	Drugs		
	Xylazine	Acepromazine	Diazepam
Blinking of eyes	Present in 03	Present in 02	Present in 05
Lifting of head	Present in 04	Present in 04	Absent in all
Neck movement	Present in 02	Present in all	Present in 04
Wing flapping	Present in all	Absent in all	Absent in all
Salivation	Present in 03	Present in all	Present in all
Defecation	Present in 01	Absent in all	Absent in all

DISCUSSION:

Anaesthesia is most important element in the process of surgical operations; and safe and effective sedation and anaesthesia methods are as much important for birds, not only for surgical procedures but also for safe handling and diagnostic procedures, especially in case of aggressive birds. In order to determine the sedative and analgesic effects of xylazine, acepromazine and diazepam on ducks, the study was carried out during 2013. Our findings are in agreement with other scientists who used different doses of anaesthesia on different animals or birds in throughout the world. Number of drugs used to anaesthetize the animals during surgical operations which include xylazine, acepromazine and diazepam and their combinations (Heaton and Brauth, 1992). Intramuscular (IM) injection of xylazine smoothly induces loss of righting reflex and response to painful stimulus in leghorn roosters (Mostachio *et al.*, 2008). Xylazine, Detomidine and Medetomidine are usually used with combination with ketamine (Freed and Baker, 1989). Ashraf *et al.*, (2009) studied the effects of xylazine, ketamine, and a cocktail of them. All treatments were administered intramuscularly. They suggested that in parrots the use of xylazine (alone) was safe for handling and less painful procedures while a xylazine-ketamine cocktail was a suitable anaesthesia for painful procedures at the dosages.

The results showed that statistically, the differences in the body temperature, heart rate, respiratory rate and other sedative and analgesic parameters of ducks treated with xylazine, acepromazine and diazepam were significant ($P < 0.05$). The average body temperature of ducks treated with xylazine, acepromazine and diazepam was 104.47 ± 1.10 , 105.13 ± 0.77 and $105.71 \pm 1.02^\circ\text{F}$, respectively. The average heart rate of ducks anesthetized by xylazine, acepromazine and diazepam was 126.20 ± 7.44 , 100.78 ± 5.74 and 111.46 ± 4.22 beats/min, respectively. The average respiratory rate of ducks treated with xylazine, acepromazine and diazepam was 21.31 ± 5.23 , 25.42 ± 4.60 and 25.60 ± 3.926 breaths/min, respectively. The onset of sedation in ducks anesthetized by xylazine, acepromazine and diazepam was recorded in 3.42 ± 0.16 , 3.46 ± 0.16 and 4.33 ± 0.81 minutes after drug administration. The degree of sedation 4.00 ± 0.89 , 4.50 ± 0.54 and 3.50 ± 0.08 indicated moderate to high degree of sedation, respectively. The duration of sedation in the ducks anesthetized with xylazine, acepromazine and diazepam was 67.50 ± 22.90 ,

80.80±10.6 and 67.30±15.10 minutes, respectively. The degree of analgesia indicated that no analgesic effects were observed in ducks anaesthetized with xylazine 0.00±0.00 minutes. However, moderate degree of analgesia was recorded in ducks anesthetized with acepromazine 2.00±0.00 minutes and diazepam 2.66±0.08 minutes. In case of duration of analgesia, the duration of analgesia was higher in ducks anaesthetized by diazepam 11.50±0.80 minutes, while 8.37±1.05 minutes duration of analgesia was observed in ducks anesthetized by acepromazine. The lowest 3.50±0.00 minutes, was noted in ducks anesthetized by xylazine. No onset of analgesia was found in ducks anesthetized by xylazine, while delayed onset of analgesia 9.33±1.90 minutes was found in ducks anesthetized by diazepam. The onset of analgesia was recorded 3.50±0.20 minutes in ducks anesthetized by acepromazine. The recovery of ducks from anesthesia was recorded in 51.00±7.21, 49.80±4.02 and 32.10±11.1 minutes, when anesthetized with xylazine, acepromazine and diazepam, respectively. The onset of sedation, onset of analgesia, duration of analgesia was relatively delayed; achieving moderate degree of sedation and early recovery was observed in ducks anesthetized with diazepam. These results are fully supported by the findings of Durrani *et al.*, (2005) who reported combined application of Detomidine-ketamine for rapid anaesthesia in parrots; while Ghadiri *et al.*, (2006) suggested combination of ketamine + detomidine or diazepam for effective and safe anesthesia in parrots for surgical operations. Similarly, Metehan *et al.*, (2006) used xylazine and diazepam combination and medetomidine + detomidine and did not notice any significant change in heart beat, respiration and body temperature. Moreover, Lumeij *et al.*, (2009) used medetomidine-ketamine and diazepam-ketamine combination in parrots; while Cruz *et al.*, (2010) have also reported combined application of anaesthetic agents for deeper anesthesia for surgical operations of birds. The body temperature in xylazine treated ducks was decreased more than acepromazine and diazepam treated ducks. Statistically, the differences in the body temperature of ducks treated with xylazine, acepromazine and diazepam were significant ($P<0.05$). On the basis of findings of the present research, it is suggested that for anesthetizing ducks for any surgical operation, xylazine may preferably be used for required sedative effects on ducks.

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