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التخدير بالكيتالار - الزيلازين فى الماعز المصرى

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تم الحقن العضلى لخليط من الكيتامين والزيلازين فى الماعز المصرى . ولقد تمت دراسة التأثير الاكلينيكى لهذا الخليط باستخدام ثلاث جرعات مختلفة . ووجد أن الجرعة المناسبة لتخدير الماعز المصرى هى ٨ مجم كيتامين و ٢٠ مجم زيلازين لكل كيلو جرام من وزن الحيوان .  
ولقد وجد أن هذه الجرعة تحدث تخديرا جيدا يستمر لمدة ٦٧ و ٧٨ دقيقة فى المتوسط وكذلك وجد أنه يقلل مؤقتا من معدل التنفس وعدد ضربات القلب وكذلك درجة حرارة الجسم خلال فترة التخدير .

ويعود الحيوان الى حاله الوقوف وانتهاء فترة التخدير بعد حوالى ٦٣ دقيقة بعد انتهائها التخدير . بالنسبة لصورة الدم فيحدث تغيير مؤقت سرعان ما يختفى مع انتهائها فترة التخدير .

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## KETAMINE-XYLAZINE ANAESTHESIA IN EGYPTIAN GOATS

(With 4 Tables & One Figure)

By

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### SUMMARY

I/M injection of Ketamine-Xylazine mixture was performed in Egyptian goats. Three doses of the mixture were used to determine its clinical effect. The optimum dose to be more efficient for goats is 8.0 mg. and 0.2 mg. per kilogram body weight from Ketamine and Xylazine respectively.

This dose produced a good surgical anaesthesia which lasted for 78.67 minutes. There was a transient reduction in respiratory rate, heart rate and rectal temperature during the anaesthetic period. Recovery occur within an average of 63 minutes which is smooth and uncomplicated. A transient changes occur in the haematological profile.

### INTRODUCTION

Ketamine HCl is now widely used in veterinary practice as a short acting general anaesthetic (BECK *et al.* 1971; COMMON, 1970; HUMPHERY, 1971 and EL-GUINDY *et al.* 1981). The results of the above mentioned authors pointed out the relative efficiency and safety of the drug. Xylazine HCl as a preanaesthetic and skeletal muscle relaxant, in a variabale dose, was used in combination with Ketalar (AMEND, 1972; KUMAR *et al.* 1976; KELLER and BAUMAN, 1978 and SAMY *et al.* 1982).

In the present study, Xylazine was used with Ketamine to induce anaesthesia in Egyptian goats. Estimation of the dose used, duration of anaesthesia, time of onset, the action and the clinical effects were evaluated.

### MATERIAL and METHODS

Fifteen native breed goats of different ages, sex and weight were used in the study. They were healthy and free of parasites or any infection. All animals were fastened for 24 hours before the trial. The animals were divided into three groups, each of five animals.

A mixture of Xylazine HCl 2% (Rompun, Bayer) and Katamine HCl 5% (Ketalar, Park Davis) was intramuscularly adminstèred in different doses as follows:

- Group I : 0.2 mg. Xylazine and 8.0 mg. Ketamine / Kg.B.Wt.
- Group II : 0.2 mg. Xylazine and 6.2 mg. Ketamine / Kg.B.Wt.
- Group III : 0.4 mg. Xylazine and 8.0 mg. Ketamine / Kg.B.Wt.

Rectal temperature, heart and respiratory rates were recorded 15, 30, 60 minutes, 2, 4 and 24 hours after anaesthesia. In addition, time onset of action, duration of anaesthesia and recovery period were measured.

Haematological studies including total red and white cells count, Haemoglobin concentration, Haematocrit value, differential leucocytic count were performed at the time intervals by the methods described by COLES (1980).

### RESULTS

I/M administration of Ketamine HCl and Xylazine HCl in a dose of 8.0 mg./Kg.B.Wt. respectively (Group I) proved to be the best selective dose with a smooth general anaesthesia. In this group, goats became recumbent within 2-6 minutes. All reflexes except the palpebral one was completely disappeared within a time of ten minutes post-injection (onset of effect). There was a complete muscle relaxant effect. Depth of anaesthesia was deep with no pain response elicited in any of the goats of this group.

Reduction in the respiratory, and pulse rates (Fig. 1) was observed during the duration of anaesthesia. The rectal temperature was lower than normal but it began to return to normal 24 hours following administration. Dose, onset, duration and recovery period were shown in table (1). The duration of anaesthesia was 86 minutes. Following that time reflexes began to appear with head of the animal in the lateral position (milk-fever position).

In animals of the second group, depth of anaesthesia was of moderate to slight. Two goats out of five expressed pain response. In group III, depth of anaesthesia was deep to very deep to very deep with a more prolonged duration of anaesthesia. Recovery period was highly increased with a mean of 150 minutes after which reflexes began to reappear. The animal stood with 30-90 minutes.

Haematological examination (Tables 2-4) showed that the total number of erythrocytes, haematocrit, haemoglobin concentration and leucocytes were more markedly decreased during anaesthetization. The percentage of lymphocytes decreased while that of neutrophils increased.

## DISCUSSION

In Egyptian goats, an intramuscular administration of a combination of Xylazine at a dose of 0.2 mg/kg and Ketamine at a dose of 8.0 mg/kg. induced a smooth general anaesthesia and complete muscle relaxation for a mean duration of 86 minutes.

In a similar study on goats, KUMAR *et al.*, (1976) found that i.m. administration of a mixture of Xylazine (0.22 mg/Kg.B.Wt.) and Ketamine (11 mg/Kg.B.Wt.) was the most preferable dose to induce anaesthesia for 40 to 45 minutes.

In Egypt, SAMY *et al.* (1982) recorded as dose of 0.3 mg/Kg.B.Wt. of Xylazine mixed with 3.0 mg/Kg.B.Wt. of Ketamine, injected intravenously in the sheep to produce a state of general anaesthesia that lasted for an average period of 75 minutes.

KELLER and BAUMAN (1978) advised the same dose used in this work, in 3 goats and observed that the duration of anaesthesia varied from 50 to 85 minutes which was sufficient to perform castration.

Our experimentation recorded a slight increase in the respiratory rate for a short time which was followed by a sharp reduction that persisted at least four hours, then began to rise gradually till it reached its normal level. This observation was also reported by different authors using various types of anaesthetic agents, (JONES, 1965; LUMB and JONES, 1973 and EL-GUINDY *et al.*, 1981).

The slowing of respiration with Rompun is to be regarded as an expression of its inhibitory effect on the respiratory centre.

The hypothermic effect of the combined drugs used was mainly due to excessive loss of heat as a result of depression of the peripheral sympathetic system which gives rise to peripheral vasodilatation (MOTTELIB and EL-GUINDY 1975). SAGNER *et al.* (1968) mentioned that the decrease in the cardiac rate might be due to central suppression of the sympathetic trunk.

Regarding the haematological findings, it was found that haematocrit values and RBCs count were reduced up to about 39% and 22% respectively. BOLBOL and MISK (1979) proved that decline of HCT values as well as the reduction of RBCs count are principally due to the erythrocyte storage in the spleen and partly to the dilution of the circulating blood as the result of the blood diluting effect of the preparation. Therefore, in our opinion and depending on this fact all haematological parameters in the present study were reduced due to the haemodilution following administration of the drug and this includes Hb content, WBCs count and all other constituents except the differential leucocytic count.

A marked rise in neutrophils percent was observed with subsequent reduction in lymphocytes. This result is similar to the observations of MOTTELIB and EL-GUINDY (1975). This neutrophilia may be a defensive mechanism of the body against the administered preparation.

It is therefore, concluded that the combination of Ketamine HCl and Xylazine HCl in a dose of 8.0 mg. and

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0.2 mg/Kg.B.Wt. respectively is sufficient to induce anaesthesia in the Egyptian goats. If there is an operation which demands more time, the dose of Xylazine may be increased up to 0.4 mg/Kg.B.Wt. to obtain prolonged duration of anaesthesia.

## REFERENCES

- Amend, J.F. (1972): Premedication with Xylazine to eliminate muscular hypertoxicity in cats during Ketamine anaesthesia. VM/SAC 67, 1035-1037.
- Beck, C.C.; Coppock, R.W. and Ott, B.S. (1971): Evaluation of Vetalar (Ketamine HCl). A unique feline anaesthesia. VM/SAC 66, 993-996.
- Bolbol, A.E. and Misk, N.A. (1979): The role of spleen on the circulating blood of sheep tranquilized with Rompun (Bayer). Med. Vet. Rev. 1, 40-48.
- Coles, E.H. (1980): Veterinary Clinical Pathology. 2nd Ed., W.B. Saunders, Co., Philadelphia and London.
- Common, M. (1970): Clinical experience with Ketamine hydrochloride as an intramuscular general anaesthetic in the cat. VM/SAC 65, 1151-1152.
- El-Guindy, M.H.; Monzaly, M.El-M.; Mottelib, A.A.; Nasef, M.T. and Bolbol, A.E. (1981): Studies on the effect of some anaesthetics in sheep. 13th Arab Vet. Congress, Cairo.
- Humphery, W.J. (1971): Ketamine hydrochloride as a general anaesthetic in dogs. Mod. Vet. Prac. 52, 38-39.
- Jones, L.M. (1965): Vet. Pharmacology and Therapeutics. 3rd Ed. Oxford & IBH Publishing Co., Calcutta.
- Keller, G.L. and Bauman, D.H. (1978): Ketamine and Xylazine anaesthesia in the goat. VM/SAC 73, 443-444.
- Kumar, A.; Thurman, J.C. and Hardenbrook, H.J. (1976): Clinical studies of Ketamine HCl and Xylazine HCl in domestic animals. VM/SAC 71, 1707-1712.
- Lumb, W.V. and Jones, W.W. (1973): Vet. Anaesthesia. Lea & Febiger, Philadelphia, U S A.
- Mottelib, A.A. and El-Guindy, M.H. (1975): Studies on buffaloes tranquilized by Rompun. "Bayer". Zbl. Vet. Med. A, 22, 407-413.
- Sagner, G.; Hoffmeister, G. and Kroneberg, G. (1968): Pharamkologische Grundlagen eines neuartigen Preparates für die Analgesie, Sedation und Relaxation in der Veterinär-Medizin (Bay Va 1970). Dtsch. tierarztl. Wschr. 22, 565-582.
- Samy, M.T.; Tantawy, M.; Ibrahim, H. and Mottelib, A.A. (1982): Studies on the clinical application of combined Vetalar-Rompun in sheep. Assiut Vet. Med. J. 9 (17 & 18), 142-146.

Table (1)

Dose, down time, onset of induction time, duration of anaesthesia and recovery period

DOSE (Mg/Kg.)	DOWN TIME (MINUTES)	ONSET OF INDUCTION TIME	DURATION OF ANAESTHESIA	RECOVERY PERIOD
GROUP I (1) 0.2 (2) 8.0	2-6	10	86	105
GROUP II (1) 0.2 (2) 6.0	4-8	13	65	90
GROUP III (1) 0.4 (2) 8.0	1-5	10	130	150

(1): Xylazine HCl.  
(2): Ketamine HCl.

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Table (2)  
Blood profile of goats before and after injection (G: I)

	PCV	Hb	RB	W.B	Lymph.	Differential Count			Mon.
						Neut	Bas.	Eos.	
B	27	11.4	10.9	9	55.5	39.3	2.2	1.1	2.1
A, 15	25	9.3	9.9	8.3	52.0	44.3	2.0	1.0	1.9
30	23	8.2	9.2	8.0	48.7	48.0	1.8	1.0	2.0
60	20	6.3	8.4	7.7	46.5	47.1	2	1.0	1.8
120	21	7.3	9.0	8.0	46.4	49.0	1.8	1.01	2.0
240	23	9.5	9.3	8.3	47.9	44.7	2.1	1.1	2.0
24 h	27	11.2	10.5	9.2	53.2	40.1	2.1	1.1	2.1

Table (3)  
Blood profile of goats before and after injection (G: II)

B	32	11.5	12.6	10.7	51.2	42.6	2.2	1.0	2.2
A, 15	26	9.9	11.8	9.8	49.7	47.0	1.8	1.0	1.7
30	18	5.5	9.9	8.7	47.1	50.3	1.8	1.0	1.8
60	20	8.7	10.1	9.0	47.0	51.1	2.0	1.0	1.8
120	26	9.8	11.0	10.0	48.0	50.6	2.0	1.0	2.0
240	25	9.0	11.5	10.5	50.8	47.6	2.1	1.0	2.0
24 h	30	10.7	12.0	11.0	51.0	40.6	2.2	1.0	2.0

Table (4)  
Blood profile of goats before and after injection (G: III)

B	33	11.8	11.0	9.6	56.0	39.6	2.0	1.0	2.0
A, 15	22	8.3	10.0	8.9	53.3	42.8	1.8	1.0	2.1
30	21	7.5	9.3	7.9	50.5	45.0	2.0	1.0	2.0
60	21	7.5	9.2	7.2	49.1	47.0	1.8	1.0	1.9
120	20	7.1	8.7	7.0	48.0	49.5	2.0	0.9	2.0
240	22	8.7	9.1	8.0	49.6	46.3	2.0	1.0	1.8
24 h	30	11	10.6	9.6	55.3	41.6	1.9	1.0	2.0

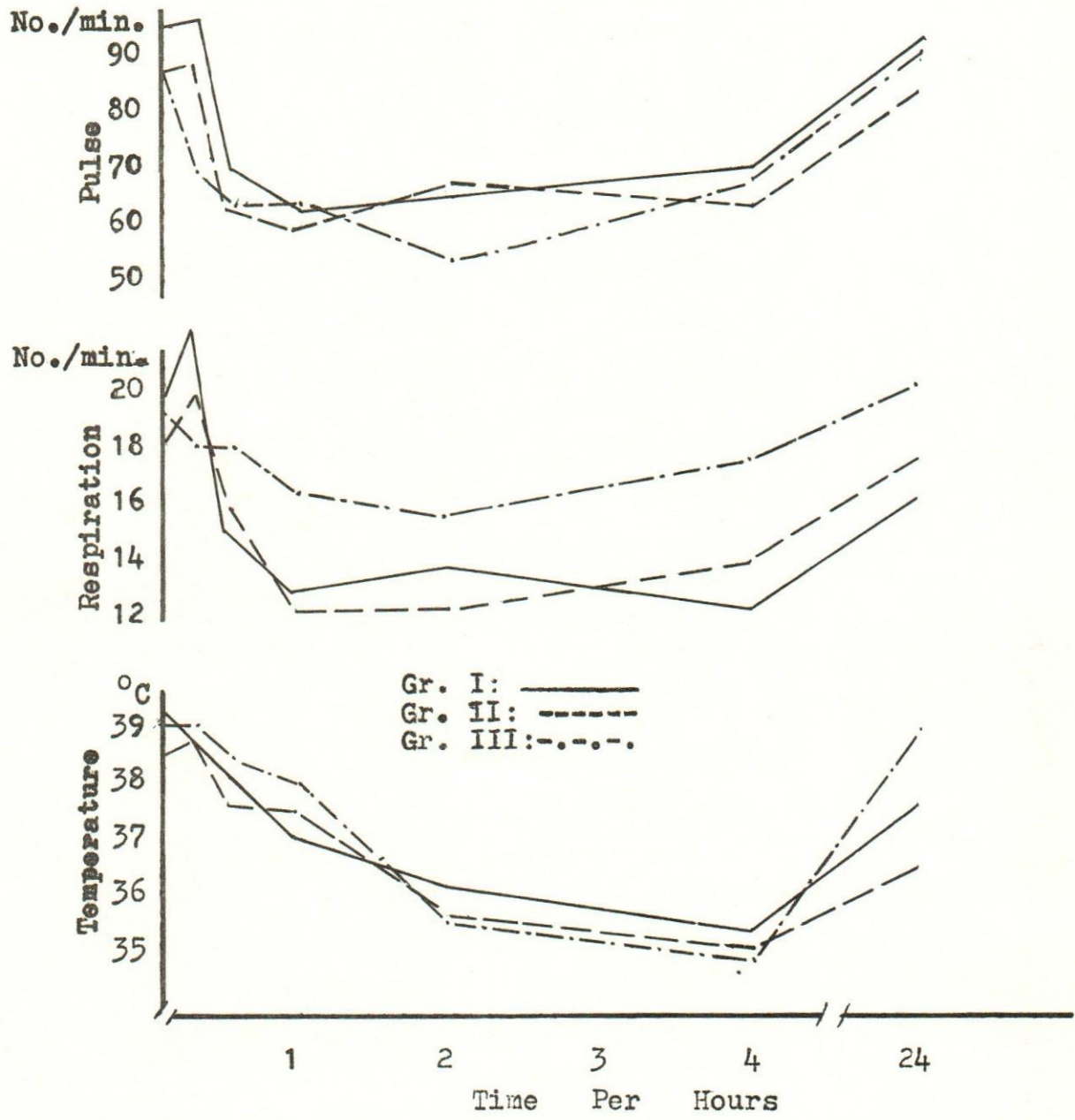


Fig. 1: EFFECT OF THE ANAESTHETIC ON RESPIRATION, PULSE AND TEMPERATURE IN THE EGYPTIAN GOATS.

