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# **SOME STUDIES ON KETAMINE AND XYLAZINE ANAESTHESIA FOR CESAREAN SECTION IN GOATS** (With 4 Tables)

By

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دراسات على التخدير بالكتامين والزيلازين للعمليات القيصرية  
في الماعـز

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أُستخدِم في هذا البحث عدد ٢٥ عذرة مختلفة الأعمار والأوزان لإختبار أنسب العقاقير المخدرة وذلك باستخدام جرعات مختلفة من الرومبون والكيٲالار مع الرومبون وأيضاً باستخدام الكيٲالار فقط . وقد تمت ملاحظة التأثيرات الأكلينيكية المختلفة على حيوانات التجربة وذلك قبل وأثناء التخدير وهي الانفعالات الانعكاسية المرتدة من الجفون والقرنية والأذن والجلد، وكذلك درجة ارتخاء العضلات علاوة على حالة التنفس ومعدل النبض ودرجة حرارة الجسم قبل وبعد التخدير. أجريت العمليات القيصرية تحت تأثير العقاقير المذكورة وقد اتضح من الدراسة أن أفضل المخدرات تأثيراً هو الرومبون وكذلك الكيٲالار مع الرومبون نظراً لطول مفعولهما التخديري وعدم تأثيرهما على الحملان. وقد وجد أن حقن الكيٲالار فقط لايجب استخدامه في العمليات القيصرية نظراً لقصر مفعوله التخديري، ولذا ينصح باستخدامه في العمليات التي تحتاج إلى وقت قصير .

## **SUMMARY**

Anaesthesia for cesarean section was performed in 15 pregnant goats of different ages and body weights, under the effect of various doses of Rompun (Xylazine), namely 0.3, 0.4 and 0.5 mg/Kg B.Wt. Other five ones under the effect of Rompun in a dose of 0.22 mg/Kg B.Wt. and ketamine Hcl (Ketalar) in a dose of 11 mg/Kg. body weight. Ketalar was used alone in a dose of 22 mg/Kg. Wt. in last five goats.

Cesarean section was carried out as soon as the signs of parturition developed or otherwise two days before delivery, indicated by enlargement of the udder the date of service.

It could be concluded that when Rompun was used in a dose of 0.5/Kg. B.Wt., it produced anaesthesia which lasted for 46.2 minutes and recumbency period of 71.2 minutes. The goats withstood well the operation and the foeti were extracted alive. Ketalar in a dose of 11 mg/Kg. B.Wt. permedicated with Rompun proved to be safe and satisfactory for cesarean section in goats. On the other hand ketalar alone gave short duration of anaesthesia and it proved to be unsatisfactory for cesarean section.



## INTRODUCTION

In Egypt small ruminants play an important role in meat and milk production. Cesarean section in this species is frequently called upon by veterinarians, especially in cases of large sized foetus, narrow maternal pelvis and improper dilatation of the cervix "Ringwomb" (HARMER & MOUNT, 1951, WALSBY, 1952; KREHENMANN, 1961; VERMA, 1973 and VERME & TYAGI, 1973).

MONZALY (1974) used Rompun in a dose of 0.25 mg/Kg. BWt. This dose allowed the goats to be placed in lateral recumbency without physical restraint. The sedative effect of Rompun appeared in 3-5 minutes after administration and lasted for 90 minutes in average.

Rompun proved to be a good anaesthetic for sheep and goats. A state of deep surgical anaesthesia that lasted for an average period of 19.2 minutes in sheep and 70 minutes in goats was obtained when the drug was injected intravenously (TANTAWY, 1978).

In goats, Rompun in a dose rate of 1.5-2 ml produced anaesthesia for about 90 minutes and the recovery phase was 3-4 hours (HOQUE and ALI-KHAN, 1982).

STRAUB (1971) used Rompun in cesarean section in sheep in a dose rate of 0.2-0.3 mg/Kg. BWt. intramuscularly. Harmful and undesirable side effects did not occur even in sick and old animals.

Rompun was used with ketamine Hcl in domestic goats undergoing a variety of surgical procedures. Anaesthesia was induced with Rompun (0.22 mg/Kg. BWt.) and Ketamine Hcl (11 mg/Kg. BWt.). Surgical anaesthesia maintained for 145-165 minutes. (KUMAR, THURMON & HURDENBROOK, 1976 and KELLER & BAUMAN, 1978).

TAYLOR, HOPKIN, YOUNG and McFADYEN (1972) stated that the induction dose of Ketamine Hcl in pregnant sheep in 2 mg/Kg. BWt., followed by a drip infusion, containing 2 mg/ml in 5% glucose given at rate of 4 ml/minute during the operative procedure.

When ketamine Hcl was given alone intravenously at a rate of 22 mg/Kg. BWt., it has been found effective for operations of short duration (KUMAR, THURMAN and DORNER, 1974).

Ketamine Hcl (22 mg/Kg. BWt.) combined with Xylazine (0.2 mg/Kg. BWt.) was injected intramuscularly in sheep. The combination reduced some of the undesirable effects of ketamine, such as muscle rigidity, insufficient suppression of reflexes and tachycardia (NOWROUZIAN, SCHELS, CHODSIAN and KARIMI, 1981).

SAMY, TANTAWY, IBRAHIM and MOTTELIEB (1982) advised to use a mixture of Ketalar at rate of 3 mg/Kg. BWt. and Rompun (xylazine) at rate of 0.3 mg/Kg. BWt. slowly injected intravenously to obtain general anaesthesia in sheep.

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**MATERIAL and METHODS**

The present work was performed on 25 pregnant goats aging from 20 months to three years and weighting from 20-35 Kg. in their last days of pregnancy. The site of injection was prepared by clipping, shaving, thorough cleansing with 2% tincture of iodine.

The drugs used were ketamin hydrochloride 5% sol. (Ketalar park Davis), and Xylazine hydrochloride 2% sol. (Rompun-Bayer).

**Rompun anaesthesia:**

The animals anaesthetized with Rompun were divided into three groups, each of five individuals:

- First group received 0.3 mg/Kg. BWt. i.m.
- Second group received 0.4 mg/Kg. BWt. i.m.
- Third group received 0.5 mg/Kg. BWt. i.m.

All animals in the aforementioned groups were premedicated before with atropine sulphate in a dose of 0.2 mg/Kg. BWt. intramuscularly.

**Ketamine Hcl anaesthesia :**

The animals anaesthetized with ketamine Hcl were divided into two groups, each of five individuals:

**First group:** Was premedicated with atropine sulphate in a dose of 0.4 mg/Kg. BWt. followed by intramuscular injection of Rompun at a dose rate of 0.22 mg/Kg. BWt. and after 15 minutes the animals of this group were injected with ketamine Hcl at a dose rate of 11 mg/Kg. BWt. intramuscularly.

**Second group:** Received ketamine Hcl in a double dose (22 mg/Kg. BWt. i.m.), proceeded by atropine sulphate as a premedican in a dose rate of 0.4 mg/Kg. BWt. i.m.

For each animal in this group the following measurements were recorded, down time, depth of anaesthesia, standing time, duration of analgesia and clinical observation (respiratory, pulse rates per minute and body temperature were recorded before pre-medication and at 2, 4 & 24 hours following injection).

**RESULTS****Rompun anaesthesia :**

The clinical signs observed during anaesthesia were manifested by, unawariness of surroundings, incoordination of the hind quarters and staggering. The animals took lateral recumbency and dropping of the upper eyelids. Pedal, ear, anal and conjunctival reflexes were very sluggish.



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In the **first group**, where 0.3 mg/Kg. B.Wt. was used the onset of the drug's action became clear after an average period of 50 minutes. The anaesthetic period lasted for 33 minutes and the skin sensibility appeared 51 minutes following injection.

In the **second group**, where 0.4 mg/Kg. B.Wt. was given the onset of the action became manifested after an average period of 4.2 minutes. The depth of anaesthesia lasted for an average period of 41.2 minutes. The skin sensation was regained after an average period of 81.2 minutes.

In the **third group**, where 0.5 mg/Kg. B.Wt. was given the anaesthetic effect appeared after an average period of 3.7 minutes. The anaesthetic period lasted for an average period of 46.2 minutes, followed by sternal recumbency for an average period of 71.2 minutes. The skin sensibility appeared after 83.7 minutes.

The clinical observations observed in animals of the three groups are tabulated in Tables (1 & 2).

All goats anaesthetized with Rompun withstood the operation and the foeti were extracted alive. Within two hours following the operation the foeti began to walk in a staggering gait searching for their mothers.

#### Ketamine Hcl anaesthesia:

In all animals incoordination, recumbency and salivation were noticed after injection. The palpebral and conjunctival reflexes were sluggish, while the ear, pedal and anal reflexes were abolished.

In the **first group**, where ketalar premedicated with Rompun and atropine sulphate, were used, the anaesthetic effect appeared after an average period of 4 minutes. The average recumbency period was 72 minutes. The anaesthetic period lasted for an average of 58.8 minutes and skin sensation appeared after 90 minutes (Table 3).

All operated goats tolerated well operation and the foeti were not affected by the combination of anaesthesia. All foeti were born alive and suckled their mother in a normal manner.

In the **second group**, where the Ketalar in a double dose (22 mg/Kg. B.Wt.) was given by intramuscular injection, preceded by Atropine sulphate as a premedication, it was noticed that the effect of the drug appeared 2.4 minutes after injection. The depth of anaesthesia lasted for an average period of 24.4 minutes. Recumbency period was 46.4 minutes and skin sensibility appeared after 28 minutes (Table 4).

Caesarean section could not be performed in this group because of the relative short anaesthetic duration of the drug.

### DISCUSSION

Xylazine produces a state of deep marked muscle relaxation and a variable degree of analgesia to a deep general anaesthesia particularly in ruminants (MONZALLY, 1974).



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and STRAUB, 1971).

The obtained results showed that the onset of action appeared after an average period of 4.2 minutes and the depth of anaesthesia lasted for an average period of 60 minutes. These results are in agreement with those reported by MONZALY (1974).

The best results were obtained in the group injected with 0.5 mg/Kg. B.Wt. and premedicated with atropine sulphate. On the other hand TANTAWY (1978) advised the use of Rempun in a dose of 0.8 mg/Kg. B.Wt. intramuscularly in goats.

Ketalar injected intramuscularly to induce general anaesthesia in goats in a dose of 11 mg/Kg. B.Wt., after premedication with Rompun (0.22 mg/Kg. B.Wt., and atropine sulphate (0.4 mg/Kg. B.Wt. proved to be satisfactory. The presented dose coincide with the doses advised by KUMAR et al. (1974), KELLER and BAUMAN (1978) and TANTAWY (1978).

The result of the present work are in agreement with those reported by KELLER & BAUMAN (1978); TANTAWY (1978) and KUMAR et al. (1974), who mentioned that injection of ketalar alone induced a state of anaesthesia for an average of 20 minutes, so ketalar alone is a good anaesthetic agent for short surgical procedures.

Concerning the foeti, following caesareotomy under the effect of ketallar alone and ketalar together with Rompun, they are delivered alive and survived for several weeks. These results are supported by the results of TAYLOR et al. (1972).

On the basis of the present study it could be concluded that ketalar with Rompun and Rompun anaesthesia proved to be safe and satisfactory for caesarean section in goats. On the other hand ketalar alone gave short duration of anaesthesia. It can be used for operation of short duration but it proved to be unsatisfactory for caesarean section.

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Table (1): Dose and action of Rompun in goats.

Group	Dose mg/kg. B.wt.	Onset	Depth	Recumb.	Skin sensa.
I	0.3	4.7	33	50	51 min.
II	0.4	4.2	41.2	62	81.2 "
III	0.5	3.7	46.2	71.2	83.7 "

Table (2): Clinical observations of Rompun in goats.

Clinic. Observ.	Dose	Before injection	After injection		
			2h.	4h.	24h.
Temperature °C	0.3	39.9	38.9	39.5	39.8
	0.4	39.3	39.1	38.9	39.3
	0.5	39.2	39.1	39.4	39.0
Pulse/minute	0.3	95	90	90	96
	0.4	96	89	96	95
	0.5	101	94	101	101
Respiration/ minute	0.3	21	17	19	22
	0.4	19	20	20	20
	0.5	21	18	20	21

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Table (3): Action and effect of Ketalar with Rompun in goats.

Clinical Observation	Before injection	After injection		
		2h.	4h.	24h.
Temperature °C	39.3	39.8	39.4	39.5
Pulse/min.	97	105	100	98
Respiration/min.	24	36	30	25
Onset of action	4 minutes			
Depth of anaesth.	58.8 minutes			
Recumbency	72 minutes			
Skin sensation	90 minutes			

Table (4): Action and effect of Ketalar alone in goats.

Clinic. Observ.	Before injection	After injection		
		2h.	4h.	24h.
Temperature °C	39.0	38.4	38.9	38.7
Pulse/min.	94.0	101	100	96
Respiration/min.	27	34	24	26
Onset of action	2.4 minutes			
Depth of anaesthesia	24.4 minutes			
Recumbency	46.4 minutes			
Skin sensation	28 minutes			