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التخدير العام باستخدام السافان في الجمال

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تمت تجربة عقار السافان بمفرده لتخدير الجمال تخديرا عاما بواسطة الحقن في الوريد وذلك باستخدام جرعتين مختلفتين (٣ ، ٦ مجم/كجم من وزن الجسم) .

وبالاضافة لدراسة تأثيره على مكونات الدم والسيرم ونشاط بعض الأنزيمات وعمل اختبار كفاءة للكلية والكبد تم تحديد مستوى التخدير الذى نتج عن الحقن وعملت عمليات جراحية مختلفة لتحقيق نفس الغرض .

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SAFFAN ANAESTHESIA IN CAMELS

(With 3 Tables, 3 Figs. & one Diagram)

By
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SUMMARY

Saffan was used as a sole intravenous anaesthetic agent in camels in two doses (3 and 6 mg/Kg B.Wt). It was found to have desirable features as rapid and smooth induction, uncomplicated recovery period, no harmful effects on haemogram and blood chemistry, good muscle relaxation, varying depth of general anaesthesia and steady maintenance of vital functions of the body.

INTRODUCTION

Saffan (Althesin, CT 1314) is a steroid anaesthetic composed of two pregnandione derivatives, alphaxalone (3 -hydroxy-5 -pregnane-11, 20-dione) and alphadolone acetate (21 acetoxy-3 -hydroxy-5 -pregnane-11, 20-dione). Clinical trials in veterinary practice were early reported by CHILD, et al. (1971) and EVANS (1975) in cats. Other investigators used it in other species as birds (COOKSON and MILLS, 1983), horses (HALL, 1972), sheep (WATERMAN, 1981) and large ruminants and goats (CAMBURN, 1982).

In the view of expanding the use of this agent it was planned to undertake a preliminary trial to ascertain its possible usefulness in camelidae. The present study includes besides the judgement of its clinical effects, the determination of some blood constituents and the activity of some serum enzymes judging the liver and kidney functions.

MATERIAL and METHODS

A total of four male and female camels aging between five and ten years were used in the present experiment. Three trials were undertaken on each animal with a minimum seven days interval. As a sole anaesthetic agent, Saffan was tried in two dose rates; 3 mg/Kg. B.Wt. and 6 mg/Kg. Wt. The calculated dose was injected in the jugular vein as a single bolus.

Jugular blood samples were collected before and at 1, 5, 10, 15, 20, 30, 60, 120 and 180 minutes after injection. At each collection two blood samples were obtained, one with EDTA for complete haemogram and the second to provide serum for determination of total protein, glucose, GOT and GPT.

Induction, degree of sedation, duration and clinical responses including rectal temperature and patterns of heart beats and respiration were recorded. Reflexes were also tested including movement of the eyeball, palpebral, conjunctival, corneal, pupillary, laryngeal, pharyngeal

and righting reflexes. Moreover, some surgical interferences were conducted including abscess incision, dressing of old deep wounds, suturing of cutaneous wounds, laparotomy and rumenotomy, in over to test the efficency of the anaesthesia.

RESULTS

Clinical, haematological and serum changes after Saffan anaesethesia are presented in tables 1 & 2. The reflexes and muscles relaxations data during Saffan anaesethesia are presented in table (3).

DISCUSSION

Previous clinical experience with Saffan in ruminants suggested that the optimum dose for induction of anaesthesia was 3 mg/Kg. Wt. as a single intravenous bolus (CAMBURN, 1982). Such dose resulted in ten minutes surgical anaesthesia. If the dose was increased to 6 mg/Kg. B. Wt. the anaesthetic period extended to twenty minutes. In other species (cats, monkeys, birds, reptiles and horses) the dose varied widely.

The need for an easily administered sole anaesthetic agent in camels increased by time, since the animal plays a traditional and economic role in the middle east area. However, the available literature about the use of Saffan in camels is lacking.

In the present experiment a quick smooth onset of unconciousness without preliminary excitement was achieved with using either the 3 or 6 mg/Kg. B. Wt. dose. The induction time (between injection and loss of righting reflex) was 45-60 seconds. Anaesthesia was induced virtually immediately following the completion of the 3 mg. dose, while with the use of 6 mg. dose anaesthesia was induced before the completion of injecting the calculated amount of Saffan. The sleeping time varied between 45-75 minutes with the utilized doses 3 and 6 mg. respectively (Fig. 1, 2 & 3).

Respiration was regular, deep and thoraco-abdominal with the used two doses. No cough was observed. Respiratory rate, however, was decreased significantly ($P < 0.001$) five to ten minutes after the injection of 6 mg dose, then returned back to its normal level (Table 1 & 2). It seems, therefore, that the effect of the drug Saffan on respiratory rate is dose dependent. Previous observations by HALL and CLARKE (1983) supported the results obtained in this investigation. However, WATERMAN (1981) and CAMBURN (1982) did not notice any excessive degree of depression of respiratory system. In the present work it was noticed also that apnoea was not produced and animals mucous membranes remained pink throughout the period of anaesthesia. Moreover, intubation was performed easily indicating the absence of laryngospasms. In the meantime active regurgitation did not ensue, even without prior fasting, with any of the utilized doses. However, CAMBURN (1982) reported ruminal regurgitation in a ewe and attributed this to the use of a low dose of Saffan. Moreover, salivation did not occur throughout the period of anaesthesia, while it was reported to occur in other species. (HALL and CLARKE, 1983).

With the utilized doses 3 and 6 mg simple tachycardia was recorded and disappeared after 30 and 60 minutes respectively (table 1,2). Such sign has no clinical significance since it is well known that tachycardia is rather common in all kinds of animals under nearly all forms of anaesthesis (HALL and CLARKE, 1983). However the cause of tachycardia accompanying Saffan anaesthesia may be due to the direct action of the drug on the myocardium (HALL and CLARKE, 1983).

No significant changes in rectal temperature were recorded with the application of Saffan throughout the whole experiment. However, general anaesthesia interferes with animal ability to control its temperature (SYKES, et al. 1981).

According to GUEDEL (1951) and HALL and CLARKE's (1983) classification of surgical anaesthesia stage, the use of the 3 mg. dose produced light plane of surgical anaesthesia (10 minutes). In this stage the reflexes (palpebral, conjunctival and corneal) were sluggish, eye-ball moving from side to side then fixed and limbs and jaws were relaxed (table 3). In the meantime with the use of 6 mg/Kg. B. Wt. the laryngeal and pharyngeal disappeared, eye-ball was fixed and pupillary light reflexe was absent. Complete muscular relaxation including the abdominal muscle was rather recorded. Evaluating these observations one can conclude that 6 mg. dose produced about half way of the third plane of surgical anaesthesia stage (Fig. 1, 2, 3). The first dose was employed, in the present work, for abscess incision, correction of vaginal prolapse, dressing of old deep septic wounds in different sites of the body and suturing of recent wounds. So such dose may be indicated in cases of obstetrical examination, examination of the external genital organs in males, suturing of wounds, rectal or vaginal prolapse and all minor surgical interferences. In the meantime 6 mg. dose produced anaesthesia sufficient enough for laparotomy and rumenotomy in camels. So such a dose may be employed for laparotomies consuming less than thirty minutes.

Blood picture was not affected by the use of Saffan during the tested period. The same was true for blood and serum constituents (Table 1). The only significant change was a rise of glucose level (table 2). Such an increase may be attributed to the sympathomimetic effect of Saffan leading to sudden mobilization of muscles and liver glycogen.

In short the present study showed that the anaesthetic alphaxalone - alphadolone proved to be a very reliable and smooth induction agent in camels. Its genereal characteristics include wide saftey margin, lack of tissue irritability, good muscular relaxation and uncomplicated recovery. However, the volume of agent to be injected was the only marked disadvantage thus one may use six 50-ml. syringes with chance of needle displacement for continuous injection, so as to ensure quick administration. EALES (1976) faced similar difficulty to anaesthetize horses using Saffan.

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Table (1)

Clinical, Haematological and serum changes after Saffan anaesthesia in Camels

	DOSE IN mg./ Kg.B.wt	BEFORE INJECTION	AFTER INJECTION							
			one minutes	5 minutes	10 minutes	20 minutes	30 minutes	60 minutes	120 minutes	180 minutes
Heart rate / minute	3 mg.	63.83 ± 5.55	88.17 ± 0.07	100.33** ± 9.84	111.67** ±13.14	111.50** ±10.34	114.67** ±9.50	71.67 ± 7.97	62.17 ± 7.17	57.17 ±3.23
	6 mg.	65.50± 5.65	87.30** ± 8.69	97.30** ± 12.49	114.50** ±14.35	120.80** ±13.59	119.30** ±14.78	105.00* ±18.96	79.50 ±12.16	63.00 ±11.43
Respiratory rate/ minute	3 mg.	14.83 ± 0.90	14.66 ± 1.37	15.00 ± 4.16	14.50 ± 1.35	14.17 ± 0.43	15.00 ± 1.76	14.33 ± 0.47	14.17 ± o.37	14.50 ± 0.50
	6 mg.	15.32 ± 1.62	12.30 ± 2.05	11.20*± 1.07	10.70*± 0.75	11.00 ± 2.83	11.00 ± 2.00	13.20 ± 1.46	13.00 ± 1.91	15.80 ± 2.67
Rectal Temperature	3 mg.	37.45 ± 0.34	37.43 ± 0.25	37.43 ± 0.26	37.25 ± 0.22	73.20 ± 0.95	37.25 ± 0.17	37.25 ± 0.26	37.20 ± 0.33	37.23 ± 0.21
	6 mg.	37.40 ± 0.38	37.10 ± 0.20	37.20 ± 0.17	37.00 ± 0.20	37.20 ± 0.34	37.40 ± 0.38	37.40 ± 0.40	37.38 ± 0.40	37.30 ± 0.43
R.B.Cs. Mil. / ccm.	3 mg.	8.60 ± o.59	8.91 ± o.76	8.92 ± o.72	8.86 ± 1.10	8.85 ± o.74	8.52 ± 1.10	8.18 ± o.70	8.64 ± 1.12	8.45 ± 1.18
	6 mg.	8.64 ± 0.61	8.43 ± 0.93	8.71 ± 0.71	8.34 ± 0.79	8.67 ± 0.88	8.19 ± 0.62	8.50 ± 0.41	8.93 ± 0.81	8.90 ± 1.06
W.B.Cs.	3 mg.	17.00 ± 1.86	17.76 ± 1.30	17.16 ± 1.65	17.04 ± 2.42	17.38 ± 4.56	17.64 ± 3.16	16.85 ± 2.24	18.08 ± 3.24	19.07± 2.74
	6 mg.	16.03 ± 1.85	17.44 ± 3.33	15.28 ± 2.29	17.33 ± 2.45	16.00 ± 1.95	17.16 ± 1.48	16.57 ± 1.90	16.96 ± 1.59	17.22± 1.91
P.C.V %	3 mg.	32.83 ± 1.46	33.33 ± 0.75	32.67 ± 1.37	32.67 ± 1.81	32.50 ± 0.96	32.17 ± 1.34	32.50 ± 0.96	33.0p ± 0.82	32.50± 1.26
	6 mg.	34.17 ± 2.97	34.00 ± 3.65	34.00 ± 2.65	35.17 ± 3.18	36.67 ± 2.80	35.33 ± 2.68	35.00 ± 4.32	34.67 ± 2.98	35.00± 3.16
Hb gm. %	3 mg.	10.87 ± 1.62	11.33 ± 1.80	10.70 ± 1.39	10.83 ± 1.35	11.00 ± 1.76	11.32 ± 1.98	10.70 ± 2.06	10.83 ± 1.54	10.85± 1.79
	6 mg.	13.38 ± 1.35	11.67 ± 2.05	12.62 ± 2.29	12.43 ± 1.87	13.63 ± 1.47	11.60 ± 1.79	12.38 ± 1.88	12.58 ± 1.81	12.57± 1.75
Glucose mg %	3 mg.	90.00 ± 7.70	96.33 ± 4.15	100.17* ±6.09	120.83** ± 8.86	122.83** ± 13.36	125.83** ±12.39	145.50** ±22.68	139.67** ± 15.78	138.83**±16.64
	6 mg.	95.80 ± 5.34	103.70 ± 2.69	106.50** ±1.80	116.20** ± 7.97	124.20** ± 8.86	122.50** ± 8.04	124.20** ±13.17	129.30** ± 12.94	128.00**±16.07
Total protein gm. %	3 mg.	8.79 ± 1.22	8.04 ± 1.25	7.56 ±1.44	6.99 ± 0.56	9.64 ± 2.16	8.97 ± 1.73	8.70 ± 2.32	7.62 ± 1.73	7.69 ±1.36
	6 mg.	8.07 ± 1.33	8.22 ± 1.61	9.13 ±2.14	8.03 ± 1.26	8.32 ± 1.29	8.98 ± 1.90	8.10 ± 1.49	8.58 ± 1.96	8.21 ±1.64
G P T U/L.	3 mg.	7.17 ± 2.48	6.66 ± 2.29	6.83 ±2.19	7.33 ± 2.81	8.00 ± 2.11	6.66 ± 2.69	6.66 ± 2.69	7.00 ± 2.52	7.00 ±0.31
	6 mg.	9.50 ± 2.06	9.00 ± 1.83	9.00 ±3.37	9.30 ± 2.81	10.50 ± 3.77	10.60 ± 2.61	10.20 ± 3.44	10.20 ± 3.08	10.10 ±5.55
G O T U./L.	3 mg.	15.83 ± 2.61	15.33 ± 2.29	15.83 ±2.79	15.33 ± 1.97	15.33 ± 4.75	16.00 ± 4.80	15.50 ± 4.72	15.67 ± 4.07	16.67 ±4.50
	6 mg.	15.83 ± 3.13	18.00 ± 5.69	17.00 ±3.37	17.70 ± 3.25	15.00 ± 1.83	16.30 ± 2.05	16.20 ± 2.61	15.00 ± 1.63	14.33 ±4.71

* P 0.005 ** P 0.001

Table (2): The clinical and biochemical changes after i.v. adminstration of Saffan in Camels

	used dose	Mean	Onset of change (minutes after injection)	Quantitative effect	"P"
HEART RATE/ Minute	3 mg.	100.33	5	+ 36.5	0.005
	6 mg.	87.30	1	+ 21.8	0.005
RESPIRATORY RATE/ Minute	6 mg	11.2	5	- 5.1	0.001
GLUCOSE mg %	3 mg.	108.17	5	+ 10.17	0.001
	6 mg.	106.50	5	+ 10.70	0.001

Table (2): The clinical and biochemical changes after i.v. adminstration of Saffan in Camels

			Minutes after injection						
			1	5	10	20	30	60	120
OCULAR REFLEXES	Eye-ball movement	3 mg	+ ve	- ve	- ve	+ ve	- ve	- ve	- ve
		6 mg	+ ve	- ve	- ve	- ve	+ ve	- ve	- ve
	Palpebral, conjunctival and corneal	3 mg	- ve	- ve	+ ve	+ ve	+ ve	+ ve	+ ve
		6 mg	- ve	- ve	- ve	- ve	+ ve	+ ve	+ ve
Laryngeal and Pharyngeal		3 mg	- ve	- ve	- ve	+ ve	+ ve	+ ve	+ ve
		6 mg	- ve	- ve	- ve	- ve	+ ve	+ ve	+ ve
Muscles Relaxation	Limbs	3 mg	+ ve	+ ve	+ ve	- ve	- ve	- ve	- ve
		6 mg	+ ve	+ ve	+ ve	+ ve	- ve	paddling	- ve
	jaw	3 mg	+ ve	+ ve	+ ve	- ve	- ve	- ve	- ve
		6 mg	+ ve	+ ve	+ ve	+ ve	+ ve	- ve	- ve
	abdomen	3 mg	+ ve	+ ve	+ ve	- ve	- ve	- ve	- ve
		6 mg	+ ve	+ ve	+ ve	+ ve	- ve	- ve	- ve

+ ve Present - ve Absent

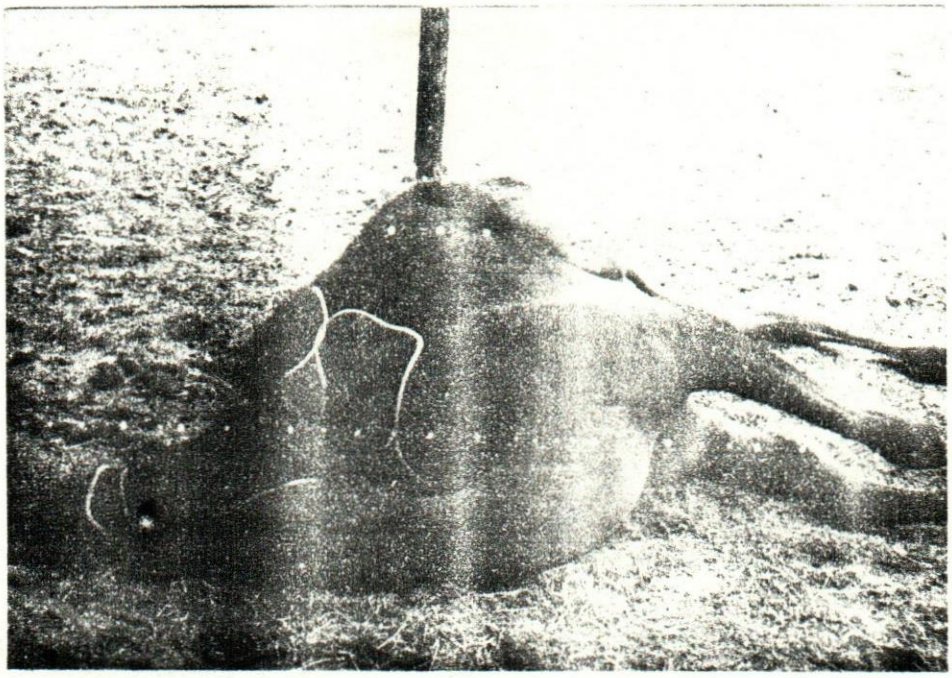


Fig. (1)

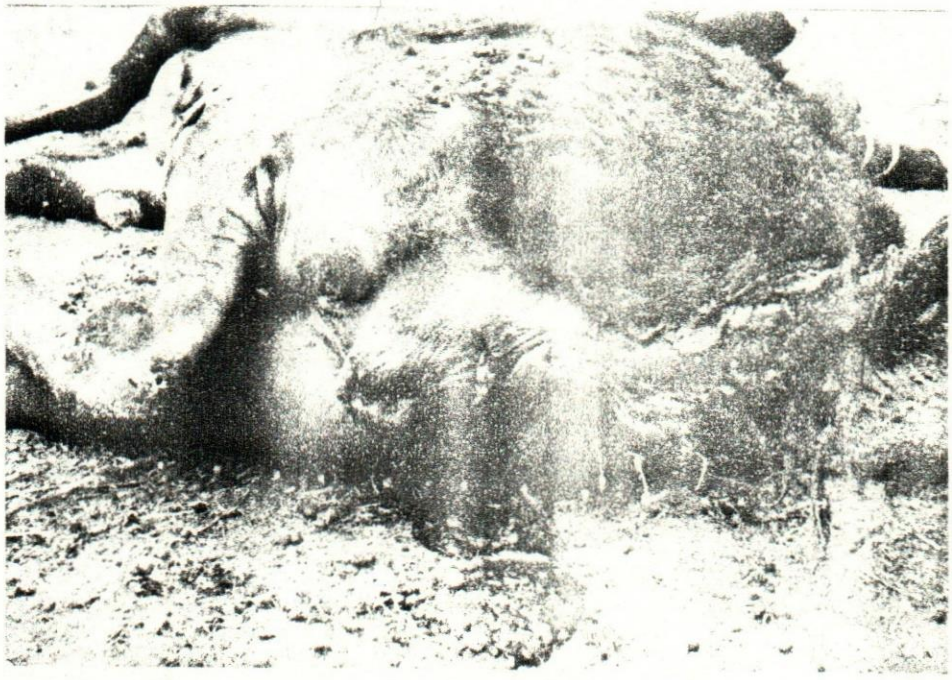
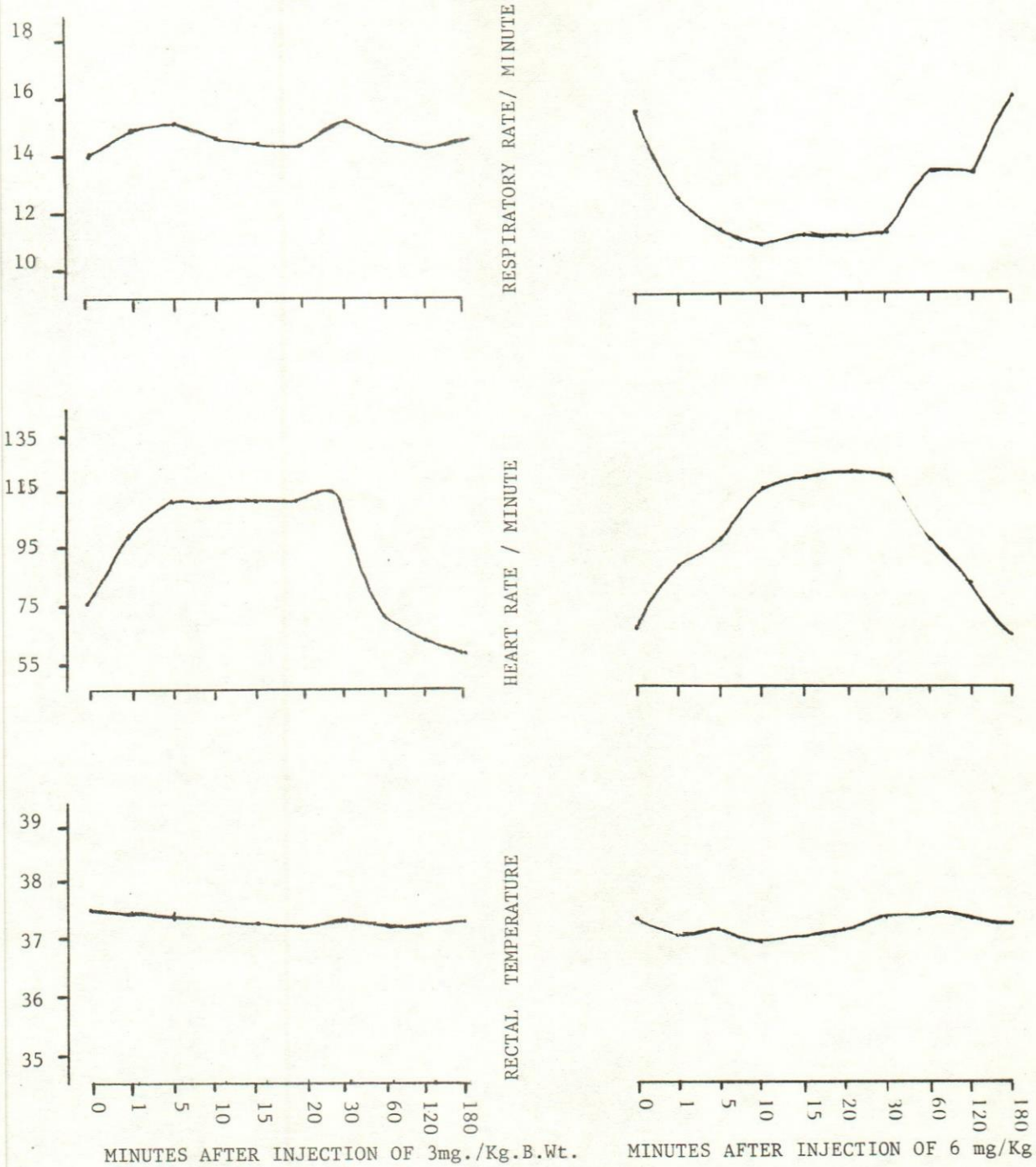


Fig. (2)

Fig. (3)



CLINICAL EFFECTS OF SAFFAN ANAESTHESIA IN CAMELS