INFLUENCE OF KETAMINE HYDROCHLORIDE ON THE INTRAOCULAR PRESSURE OF DOGS (*)

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Ketamine hydrochloride (Ketalar) is an anesthetic agent used in diagnostic and surgical procedures, mainly those of short duration. It is also used for the induction of anesthesia prior to the administration of other general anesthetic agents.

Corssen and Hoy (1957) found that this drug given intravenously produced an average 4mm Hg rise in intraocular pressure (IOP) in patients within three minutes after its administration. It was suggested that contraction of the extraocular muscles might be the responsible mechanism.

On the other hand del Prete **et al.** (1969) noticed a 4 to 8 mm Hg fall of the IOP of rabbits two minutes after intravenous administration of the drug.

Intramuscular administration to children (Ginsberg and Gerber, 1969) was accompanied by a rise in systolic and diastolic arterial pressure (AP) and tachycardia.

Traber **et al.** (1970, a) noted that the elevation in AP, cardiac output and heart rate observed after the administration of ketamine. (5mg/kg intravenously) were abolished after premedication with hexamethonium. Atropine premedication (Traber **et al.**, 1970, b) only attenuated the pressor response to ketamine.

A 1 to 2 mm Hg elevation in IOP of normal children after ketamine was observed by Rubli (1971). Intramuscular injection of 5 mg/kg in children caused a maximum increase of IOP after 15 minutes; there was also an elevation or both the AP and pulse rate (Yoshikawa and Murai, 1971).

In this research the behavior of the IOP of dogs was investigated after the administration of ketamine hydrochloride. The drug was given

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intravenously at three different doses and the IOP as well as the AP and the venous pressure (VP) were recorded. The results were compared with those from a control group.

MATERIALS AND METHODS

Dogs of either sex and various races and ages were used. The weight ranged from 5 kg to 16.5 kg. The animals were distributed into 4 groups. The first one, control, consisted of 12 animals and the other three of 5 animals each.

The animals were anesthetized with 30mg/kg of pentobarbital sodium given intravenously and placed on a "V" shaped stand. After a skin incision and dissection of subcutaneous and muscular tissues the trachea was exposed and opened between two rings. A cannula was inserted and fastened.

The left radial vein was dissected and a polyethylene tube inserted as to allow the administration of drugs, a dose of 2.000 units of heparin being injected just at the beginning of the experiments.

The right carotid artery was dissected. A François-Frank cannula filled with saline and heparin (1,250 units of heparin in 100 ml of saline) was inserted so that the AP could be recorded.

The right external jugular vein was reached through another skin incision and after dissection a polyethylene tube with saline and heparin was introduced for recording the VP.

The head was immobilized with a Czermak's mandible holder and rotated so that the left eye was under direct visualization. A lid speculum was placed. A system consisting of a 25 gauge needle attached to a laboratory stop cock connected with a polyethylene tube was filled with saline and heparin and the needle introduced in to the anterior chamber through the cornea, near the limbus, for recording the IOP. Care was taken not to touch either the iris or the lens.

The IOP, AP and VP were recorded using a physiograph made by E & M Instrument Co. Inc., desk model, type DMP-4A.

The François-Franck cannula from the right carotid artery was connected through a rubber tube, filled with saline and heparin, with a pressure transducer (E & M Instrument Co. model MK. IV).

This ond had been calibrated previously from to 20 cm Hg using a E & M Instrument Co. aneroid manometer. The transducer was connected with one amplifier of the physiograph.

The polyethylene tubes, coming one from the right external jugular vein and other from the left eye, were connected each one with a different pressure transducer (E & M Instrument Co. model P-1000-A). Each trans-

ducer had been calibrated previously using a water manometer, from O to 40 cm H_2O and was connectetd with one amplifier of the physiograph.

In the control group the animals were only anesthetized with pentobarbital sodium and the AP, VP and IOP were recorded for 120 minutes, so that the data could be usuel not only in the present study but also in researches In the groups of animals receiving the drug the AP, VP and IOP were recorded for 90 minutes. The speed of the paper was 0.025 cm/second and the timer was setted for 5 seconds. Before injecting the drug a minimum 15 minute period was allowed. The drug was given slowly in the left radial vein, at the doses of 2.5, 3.75 and 5.0 mg/kg.

For statistical purposes analysis of variance, two criteria (times and doses), fixed model, crossed, with control group, was used for evaluation of the data of the AP, VP and IOP.

Dunnett's (1965) contrasts were calculated for the data on AP and VP. Whenever necessary, as for the data on IOP, direct comparison between means was made.

RESULTS

The data of the AP in the control group and in the groups receiving different doses of the drug are in Table I. Fig. 1 shows the mean values. The analysis of variance of the data presented in Table I is in Table IV, only the variation between doses being significant. Dunnett's (1965) contrasts are in Table VII and the change of the AP was significant with doses of 3.75 mg/kg and 5.0 mg/kg but not with dose of 2.5 mg/k.

The data of the VP in the control group and in the groups receiving different doses of the drug are in Table II. Fig. 2 shows the mean values. The analysis of the data presented in Table II is in Table V, only the variation between dosed being significant. Dunnett's (1965) contrast are in Table VII and the change of the VP was significant only with dose of 5.0 mg/kg.

The data of the IOP in the control group and in the groups receiving different doses of the drug are in Table III. Fig. 3 shows the mean values. The analysis of variance of the data presented in Table III is in Table VI, the variation being significant not only betweem doses but also between times and for the interaction times doses. For this reason Student's statistics was used and the results are in Table VIII. The change of the IOP was significant with all of the three doses.

COMMENTS

An elevation of the IOP in human beings was noted after the administration of ketamine hydrochloride intravenously or intramuscularly (Corsen and Hoy, 1967: Bubly, 1971; Yoshikawa and Murai, 1971. In the rabbit a fall of the IOP was observed (del Prete **et al.**, 1969).

In this research a statistically significant change of the IOP was obtained with the three doses utilized. The maximum level was attained in the 6th or 7th minute after administration. The peak of the AP was reached earlier, in the 3rd or 4th minute after the injection. That of the VP was practically coincident with that of the IOP, namely at the 5th to 7th minute. This suggests that an elevation of the AP led to a similar change of both the IOP and VP. Thus, it does not seem that the change in balance of the tonus of extra ocular muscles is responsible for the rise of the IOP, as suggested by Corssen and Hoy (1967) and by Yoshikawa and Murai (1971). Moreover the forced duction test done in patients under ketamine hydrochloride anesthesia (Harris et al., 1968) showed no increase in resistance, althoug, as the analgesia wore off, an increase in resistance in all directions was encountered.

The rise of the IOP observed by Corssen and Hoy (1967) in patients occurred early, as noted in this research.

The elevation of the AP occurring the first 15 minutes tends be less protracted that of the VP and IOP. These two latter were higher than the initial values at all three dose levels 15 minutes after the injection, a fact observed in the AP only with the highest dose. At the 30th minute the values of the AP, VP and IOP were higher than the initial figures only at the 5.0mg/kg dose level.

After 90 minutes the IOP with the three doses was markedly lower as compared with the initial values. This did not happen with either the AP or the VP, which returned to figures equal to or near the initial ones. This findings deserves investigation in human beings.

It is interesting to note that in the first minute both the AP and the VP had raised with the three doses. On the other hand a slight drop of the IOP was seen with doses of 2.5 and 3.75 mg/kg. Only dose of 5.0 mg/kg caused an elevation of the IOP in first minute.

Student's statistics for comparison of the means of the IOP was significant with the three doses. It should be stressed that Dunnett's (1965) contrasts for the AP were significant only with doses 3.75 and 5.0 mg/kg and the contrasts for the VP were significant only with the highest dose. This suggests that the change of the IOP, although related to those of the AP and the VP, had a somewhat different behavior.

ANIMAL	WEIGHT (kg)	DOSE (mg/kg)	TIME (MINUTES) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	30	45	60	75	90	105	120
1	6.5	0.0	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.4	8.4	8.4	8.4	8.4	8.0	8.0
2	6.5	0.0	12.																1	12.1	12.1	12.1	12.1	12.1	12.1
3	7.5																	0.0	8.0	8.			10.1		
4	9.5	0.0	10.2																	10.2	10.2	10.2	10.2	10.0	10.0
5	11.0	0.0	10.3	10.																3	10.3				
MEAN			9.																9	9.					
6	16.5	2.5	12.8	14.0	16.0	16.					14.4	14.4	14.0	13.6								8	14.8	15.6	14.8	14.4							13.2	13
7	10.0	2.5	11.2	11.2	12.0	12.8	12.0	12.4	12.4	11.2	11.2	10.8	10.8	10.8	10.4	10.0	10.0	9.6				6.4														
8	5.5	2.5	8.6	8.6	8.	8.6	7.		7.8	7.4	7.4	7.0	7.		6.6	6.6					6		8	7.8					0	7.				
9	6.5	2.5										12.9	12.						13.3										9	12.9	12.9	12
10.	11.0	2.5	14.4	18.3	18.3	18.3	18.3	18.3	18.3	17.9	17.1	16.4	16.4	15.6	15.2	14.8		14.4	14.																
MEAN			12.1	13.1	13.6	13.9	13.2			12.8	12.7	12.3	12.2	12.0	11.7	11.5	11.5	11.4	11.4	11.0	11.1	11.3	11.4	13.6	13.4
11.	10.0	3.75	14.6	15.0	15.5	16.0	15.5	15.5	15.5	15.0	15.0	15.0	15.0	14.6	14.6	14.6	14.6	14.6	14.1	14.1	15.0	15.5	15.5		
12	10.0	3.75	10.3	10.6	11.0	11.0	10.6	10.6	10.6	10.3	10.3	10.3	10.3	10.3	10.3	9.9	9.9	9.9	9.9	9.9	10.6	10.3	9.9		
13	7.0	3.75	18.4	18.8	19.6	19.6	20.0	20.0	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6							
	10.0	3.75	16.8	17.6	21.3	21.3	21.3	20.9	20.9	20.5	20.1	20.1	19.7	19.3	18.9	18.5	18.5	18.5	18.0	18.5	18.9	18.9	18.9		
15	9.0	3.75	11.4	11.4	11.8	11.8	11.2	10.9	10.5	10.2	10.2	10.2	9.9	9.9	9.6	9.6	9.6	9.3	10.2	11.4	11.4	11.4	11.		
MEAN			14.3	14.7	15.8	15.9	15.7	15.6	15.4	15.1	15.0	15.0	14.9	14.7	14.6	14.4	14.4	14.4	14.1	14.5	14.9	15.0	14.		
16	9.5	5.0	11.4	14.8	20.5	20.0	20.0	20.0	18.8	18.8	18.2	17.7	16.5	16.0											16.0	16
17	6.0	5.0	13.9	16.0	16.8	17.2	17.2	16.8	16.8	16.8	16.8	16.4	16.			16.0		16.0	14.7	14.7						0	16.0	16.0	
18	8.0	5.												11.4				0	9.9	10.2	12.7	13.3	14.0	13.6	13.3	13.3	13.3	13.0	11.8		11.
19	10.5	5.0	14.								17.1	17.1							8.						
20.	6.	5.0	9.						17.1	16.7	16.3	16.3	16.0	16.			5.		9.	10.8		14.4				0	16.				
MEAN			12.0	13.															4.	16.7	17.4	17.5	17.1	16.7	16.5	16.3	16.0	15.5			

TABLE I – VALUES OF THE ARTERIAL BLOOD PRESSURE (cm Hg) OF DOGS TREATED WITH KETAMINE HYDROCHLORIDE

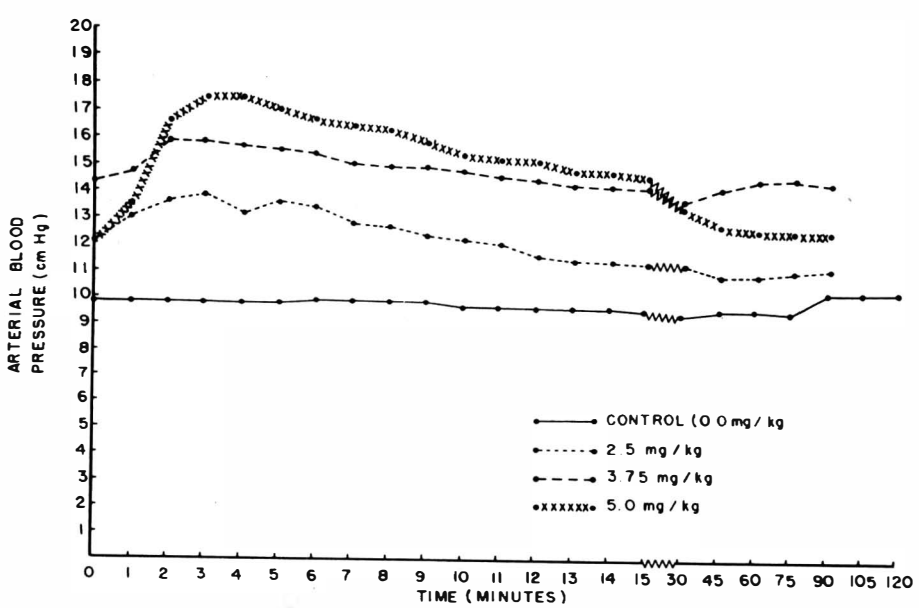

FIG. 1 - MEAN VALUES OF THE ARTERIAL BLOOD PRESSURE (cm Hg) OF DOGS TREATED WITH KETAMINE HYDROCHLORIDE. (INTRAVENOUS ROUTE)

ANIMAL	WEIGHT (kg)	DOSE (mg/kg)	TIME (MINUTES) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	30	45	60	75	90	105	120						
1	6.5	0.0	7.7	7.7	7.7	7.7	7.2	7.2	7.2	7.2	7.2	7.2	7.2	6.7	6.7	6.7	6.7	6.7	6.2	4.3	3.8	3.3	3.3	3.3	3.3						
2	6.5	0.0	11.3	11.																3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
3	7.5	0.0	5.5	5.5	5.5	5.5	5.5	5.8	5.8	5.8																				5.8	5.8	5.8
4	9.5	0.0	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	15.4	14.9	14.3	14.3	14.3	13.8						
5	11.0	0.																0	11.9	11.9	11.9	11.9	11.9	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
MEAN			10.3	10.3	10.3	10.3	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.3	9.8	9.5	9.1	9.3	9.5	9.5						
6	16.5	2.5	16.3	17.0	17.8	17.8	18.5	18.5	18.5	19.2	19.2	19.2	19.2	18				8				9									
7	10.0	2.5	25.6	25.6	27.7	29.1	29.1	29.8	30.5	29.1	29.1	29.8	27.7	27.7	28.4	27.7	27.0	27.0	27.0	22.0	22.0	21.3	22.0								
8	5.5	2.5	15.3	15.3	16.1	16.8					16.1	16.1											66.8	16.8	16.8	16.8	16.8				15.3
9	6.5	2.5	11.0	11.	11.0							11.0	11.0								0	11.7									
10	11.0	2.5	10.2	11.7	12.4	13.1	12.4	13.1	13.1	13.1																			13.1	13.1	13.1
MEAN			15.7	16.1	17.																	0	17.7	17.7	18.0	18.1	18.0	17.8	17.8	17.3	
11	10.0	3.75	13.3	13.3	14.1	14.8	16.3	17.0	17.7	18.5	17.7	17.7	17.0	16.3	16.3	15.5															
12	10.0	3.75	13.																	3	13.3	14.3	15.2	15							
13	7.0	3.75	13.8	13.8	13.8	14.7	14.7	14.7	14.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7														
14	10.0	3.75	21.0	21.9	28.5	30.4	30.4	30.4	29.5	29.5	28.5																			28.5	27.6
15	9.0	3.75	8.8	8.8	9.8	9.8	9.8	9.6	9.8	9.8	9.8	9.8	9.8	9.8	8.8	8.8	8.8	6.8	6.8	8.8	6.8	5.9									
MEAN			14.0	14.2	16.1	17.0	17.3	17.4	17.4	17.7	17.4	17.4	17.1	16.5	16.3	15.6	15.5	15.3	13.5	13.3	13.9	14.0									
16	9.5	5.0	1																10	11.7	8.8	8.0	8.0							
17	6.0	5.0	12.6	14.7	16.1	17.5														14.7	15.4	15.4	16.5	16.8	16.8	16.1	16.1	16.1	16.1		
18	8.0	5.0	10.7	11.4	15.0	17.0	18.		9	9													5	19.2	[illegible]	[illegible]	18.5	16.3	16.3		
19	10.5	5.0	15.3	15.3	20.4	19.8	17.5	17.5	17.5	17.5	16.8			8						9										16.8	16.8
20	6.5	5.0	17.5	18.3	22.7	27.0	30.0	30.7	30.7	30.7	30.7	29.2	27.7	27.0	25.6																
MEAN			13.4	14.6	18.9	20.7	21.1	21.4	21.4	21.2	20.8	19.8	9				8		5												

TABLE II- VALUES OF THE VENOUS PRESSURE (cm H_2O) OF DOGS TREATED WITH KETAMINE HYDROCHLORIDE

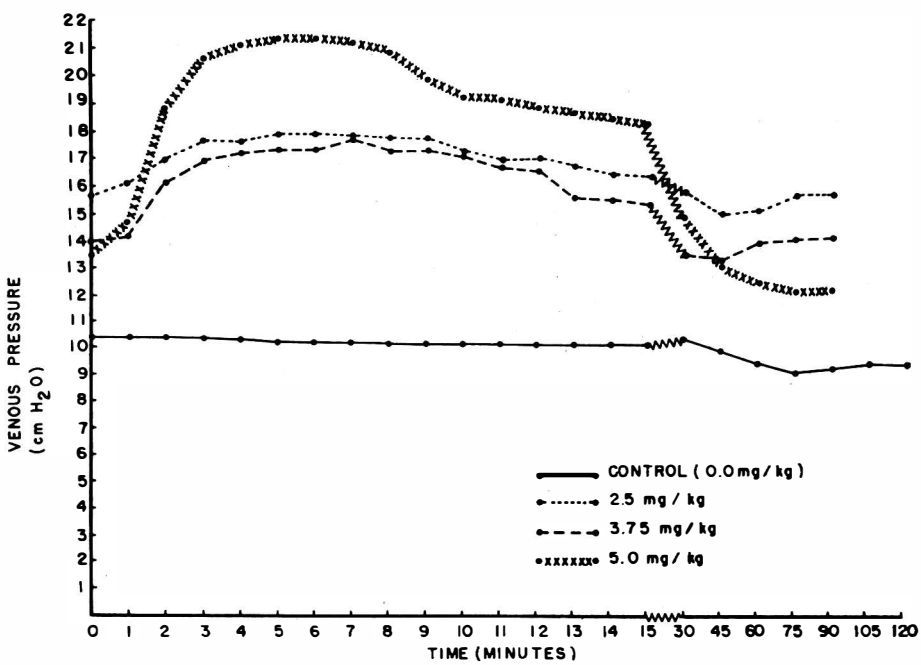

FIG. 2 - MEAN VALUES OF THE VENOUS PRESSURE (cm H_2O) OF DOGS TREATED WITH KETAMINE HYDROCHLORIDE. (INTRAVENOUS ROUTE)

ANIMAL	WEIGHT (kg)	DOSE (mg/kg)	TIME (MINUTES) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	30	45	60	75	90	105	120	
1	6.5	0.0	21.0	21.0	21.0	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	22.4	21.7	20.3	19.6	19.6	20.3	203	
2	6.5	0.0	22.0	22.0	22.0	22.0	22.8	22.8	22.8	22.8	22.8	22.8	22.													8 23.1 23.1
3	7.5	0.0	10.8	10.8	10.8	10.8	10.8	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.4	12.4	12.4	12.7	12.		12.4	
4	9.5	0.0	16.2	16.2	16.2	16.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	18.2	18.2	18.2	22.							
5	11.0	0.0	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.																8 17.5 17.5 17.5 17.5 17.
MEAN			17.6	17.6	17.6	17.			8																	7 18.1 18.1 [illegible].1 18.1 18.1 18.1 18.1 18.
6	16.5	2.5	24.2	23.4	25.0	26.5	26.5	26.5	25.			5														7 26.5 26.5 26 25.7 24.2 24.2
7	10.0	2.5	26.2	26.																						2 29.3 31.6 31.6 32.1 33.9 32.1 32.1 31.6 30.0 30.0 30.0
8	5.5	2.5	22.5	21.8	21.8	22.5	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.5	21.0	20.3	21.0	19.5			
9	6.5	2.5	26.4	23.2	27.2	27.2	28.8	30.4	30.4	29.6	29.6	28.8	28.0	27.2	27.2	27.2	27.2	27.2	24.0	22.4	23.2	22.4	21.6			
10	11.	25	25.0	28.1	28.9	30.4	30.4	32.0	32.0	32.0	32.0	32.0	32.0	31.2	31.2	31.2	30.4	30.4	28.1	29.6	27.3	27.3	28.1			
MEAN			24.9	24.5	26.4	27.6	28.1	28.9	29.1	28.7	28.7	28.4	27.8	27.2	27.2	26.7	26.7	26.7	24.							
11	10.0	3.75	27.0	23.1	24.6	25.4	27.0	27.7	28.5	29.3	29.3	29.3	29.3	29.3	29.3	28.5	28.5	27.7	27.0	23.1	22.3	23.9	23.9			
12	10.0	3.75	10.7	10.7	10.7	11.5	12.3	12.3	12.3	12.3	12.3	13.1	13.1	13.1	13.1	13.1	13.1	13.1	11.5	9.0	9.0	8.2	7.4			
13	7.0	3.75	12.8	13.5	14.3	15.0	15.0	15.8	16.5	16.5	17.3	17.3	17.3	17.3	17.3	17.3	18.0	18.0	13.5	13.5	13.5	12.8	12.8			
14	10.0	3.75	25.7	25.7	35.9	37.4	38.2	39.0	38.2	37.4	35.9	35.9	33.5	32.0	30.4	29.6	29.6	28.9	22.6	21.1	18.7	17.9	17.9			
15	9.0	3.75	27.7	23.1	23.1	23.1	23.9	23.9	23.9	23.9	23.9	23.9	23.1	23.1	23.1	23.1	23.1	22.3	22.3	20.0	20.8	20.8	21.6			
MEAN			20.8	19.2	21.7	22.5	23.3	23.7	23.9	23.9	23.7	23.9	23.3	23.0	22.6	22.3	22.5	22.0	19.4	17.3	16.9	16.7	16.7			
16	9.5	5.0	21.0	24.5	33.6	38.5	40.6	41.3	40.																	6 41.3 41.3 41.3 39.9 39.9 39.9
17	6.0	5.0	28.9	33.1	37.3	39.3	39.3	39.3	40.0	40.0	40.0	40.0	40.0	40.0	39.3	39.3	37.3	36.6	29.7	26.2	24.9	24.2	23.4			
18	8.0	5.0	29.2	29.2	31.4	36.5	40.9	41.6	42.3	43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1	40.9	27.7	23.4	22.0	19.0	18.3			
19	10.5	5.0	26.2	25.5	27.6	32.4	34.5	35.2	35.9	35.9	35.9	35.9	35.2	35.2	34.5	33.1	32.4	32.4	22.1	18.6	17.3	16.6	16.6			
20	6.5	5.0	16.7	17.8	21.6	27.7	30.0	32.1	36.2	37.8	37.8	37.8	37.0	36.2	36.2	35.4	34.7	33.1	19.3	14.6	13.9	10.8	9.2			
MEAN			24.4	26.											38.6	38.2										0 30.3 34.9 37.1 37.9 39.0 39.6 39.6 39.6 39.0 38.9

TABLE III- VALUES OF THE INTRAOCULAR PRESSURE (cm H_2O) OF DOGS TREATED WITH KETAMINE HYDROCHLORIDE

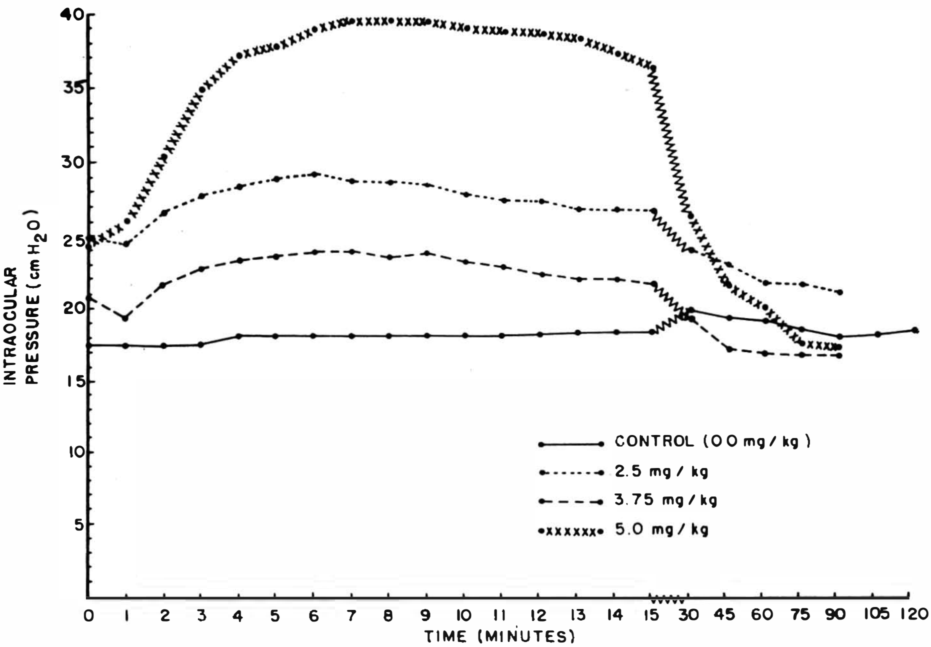

FIG. 3 – MEAN VALUES OF THE INTRAOCULAR PRESSURE (cm H_2O) OF DOGS TREATED WITH KETAMINE HYDROCHLORIDE. (INTRAVENOUS ROUTE)

VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F
BETWEEN TIMES	213.72561	20.00000	10.68628	1.01817
BETWEEN DOSES	1899.56047	3.00000	633.18682	60.32936 *
INTERACTION TIMES X DOSES	186.64352	60.00000	3.11072	0.29638
WHITHIN	3526.48800	336.00000	10.49550	
TOTAL	5826.41761	419.00000		

* SIGNIFICANT 5%

TABLE IV - ANALYSIS OF VARIANCE OF THE DATA FROM TABLE I (ARTERIAL BLOOD PRESSURE). THE VALUES OBTAINED UP TO 90 MINUTES WERE CONSIDERED.

VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F
BETWEEN TIMES	916.38190	20.00000	45.81909	1.61665
BETWEEN DOSES	3735.41285	3.00000	1245.13761	43.93272 *
INTERACTION TIMES X DOSES	572.92514	60.00000	9.54875	0.33691
WHITHIN	9522.88400	336.00000	28.34191	
TOTAL	14747.60390	419.00000		

* SIGNIFICANT 5%

TABLE V - ANALYSIS OF VARIANCE OF THE DATA FROM TABLE II (VENOUS PRESSURE). THE VALUES OBTAINED UP TO 90 MINUTES WERE CONSIDERED.

VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	
BETWEEN TIMES	4065.34157	20.00000	203.26707	6.80421 *
BETWEEN DOSES	11978.04597	3.00000	3992.68199	133.65201 *
INTERACTION TIMES X DOSES	3753.04052	60.00000	62.55067	2.09383 *
WHITHIN	10037.56800	336.00000	29.87371	
TOTAL	29833.99607	419.00000		

* SIGNIFICANT 5 %

TABLE VI - ANALYSIS OF VARIANCE OF THE DATA FROM TABLE III .(INTRAOCULAR P
RED.

ARTERIAL BLOOD PRESSURE

DOSE	0.0 mg / kg	x DOSE	2.5 mg / kg	1.139
DOSE	0.0 mg / kg	x DOSE	3.75 mg / kg	2.408*
DOSE	0.0 mg / kg	x DOSE	5.0 mg / kg	2.508*

VENOUS PRESSURE

DOSE	0.0 mg / kg	x DOSE	2 5 mg / kg	2.004
DOSE	0.0 mg / kg	x DOSE	3.75 mg / kg	1.704
DOSE	0.0 mg / kg	DOSE	5.0 mg / kg	2.264*

CRITICAL VALUE 2.06

* SIGNIFICANT CONTRAST

TABLE VII - DUNNETT'S CONTRASTS OF THE MEANS OF THE ARTERIAL BLOOD PRESSURE AND THE VENOUS PRESSURE BETWEEN DOSES

DOSE. 0.0 mg / kg x DOSE 2.5 mg / kg	t = 14.393 *
DOSE 0.0 mg / kg x DOSE 3.75 mg / kg	t = 5.398 *
DOSE 0.0 mg / kg x DOSE 5.0 mg / kg	t = 8.011 *

CRITICAL VALUE OF "t" 1.658

* SIGNIFICANT

TABLE VIII- STUDENT'S STATISTICS FOR COMPARISON OF THE MEANS OF THE INTRAOCULAR PRESSURE BETWEEN DOSES.

SUMMARY

Ketamine hydrochloride was given intravenously to dogs in three doses (2.5, 3.75 and 5.0 mg/kg) and the intraocular, arterial and venous pressures recorded with a physiograph. The results were compared with those from a control group.

A significant change of the intraocular pressure was observed with all doses. The change of the arterial pressure was significant only with the medium and the highest doses. For the venous pressure only the highest dose provoked a significant change.

After 90 minutes of the drug administration the intraocular pressure with the three doses was markedly lower as compared with the initial values. This did not happen with either the arterial or the venous pressure, which returned both to figures equal to or near the initial ones.

RÉSUMÉ

INFLUENCE DU CHLORYDRATE DE KÉTAMINE SUR LA PRESSION INTRAOCULAIRE DE CHIENS

Le chlorydrate de kétamine a été injecté dans la veine de chiens en trois doses (2,5, 3,75 et 5,0 mg/kg) et les pressions intraoculaire, artérielle et veineuse ont été enregistrées avec un «physiographe». On a comparé les résultats avec ceux d'un groupe contrôle.

Une modification significante de la pression introculaire e été observée avec les trois doses. La modification de la pression artérielle était signifiante avec la dose moyenne et la plus haute. Pour la pression veineuse la modification n'était signifiante qu'avec la dose la plus haute.

Après 90 minutes de l'administration de la drogue, la pression intraoculaire, avec les trois doses, était nettent plus basse en comparaison avec les chiffres initiaux. Ce fait n'a été observé ni avec la pression artérielle ni avec la pression veineuse, que ont toutes les deux retourné a des chiffres égaux ou presque égaux aux initiaux.

RESUMO

INFLUÊNCIA DO CLORIDRATO DE KETAMINA NA PRESSÃO INTRA-OCULAR DO CÃO

O cloridrato de ketamina foi administrado intravenosamente a cães em três doses (2,5 mg/kg, 3,75 mg/kg e 5,0 mg/kg) e as pressões intra-ocular, arterial e venosa registradas com um fisiógrafo. Os resultados foram comparados com os obtidos em um grupo controle.

U'a modificação significante da pressão intra-ocular foi observada com as três doses. A modificação da pressão arterial somente foi significante com as doses média e superior. No que diz respeito à pressão venosa, somente a dose mais alta determinou modificação significante.

Depois de 90 minutos da administração da droga os valores da pressão intra-ocular, com as três doses, eram marcadamente inferiores aos iniciais. Isto não aconteceu com a pressão arterial nem com a pressão venosa, que voltaram ambas a valores iguais aos iniciais ou próximos deles.

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