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LIDOCAINE / THIOPENTAL FOR ANAESTHETIC INDUCTION IN DONKEYS (With 1 Table & 3 Figs.)

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استخدام الليدوكايين قبل التخدير بالثيوبنتال

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لقد حقن محلول الليدوكايين بتركيز ٢٪ في الوريد قبل التخدير بالثيوبنتال في الحمير. وقد أعطت جرعة ٢ مجم/كجم من وزن الحيوان تحسن في حالة الحيوان أثناء وبعد التخدير. وبينما طالت مدة التخدير فقد قصر الوقت ليرجع الحيوان الى الوعي الكامل. وعند استخدام جرعات ٢ ، ٤ مجم/كجم من وزن الحيوان لوحظ حدوث بعض التشنجات.

SUMMARY

Lidocaine Hcl (2% solution) was administered intravenously before induction of anaesthesia with thiopental sodium. Injection of the local analgesic in a dose rate of 2 mg/kg B.Wt not only promoted a smooth induction, but also improved recovery. While the duration of anaesthesia was prolonged, the time to regain full consciousness was shortened. When Lidocaine Hcl was used in doses of 3 and 4 mg/kg B.Wt, convulsions were produced.

INTRODUCTION

Some local analgesics were concurrently administered intravenously with thiopental sodium in many anaesthetic regimens. The use of Lidocaine Hcl (Xylocaine) boluses (8.8 mg/kg B.Wt) concurrently with thiopental (11 mg/kg B.Wt) reduced the cardiopulmonary depressive effects of the latter, and has been suggested for anaesthetic induction of patients with cardiopulmonary disease (RAWLINGS and KOLATA, 1983). Procaine Hcl was used as a maintenance agent in thiopental anaesthesia in dogs (SHARMA, *et al.*, 1983). The drug was also used in combination with chloral hydrate to maintain thiopental anaesthesia in horses (WHOELER, *et al.*, 1980).

In human beings Lidocaine Hcl was used with thiopental to anaesthetize many patients (WILKINSON, et al. 1980). It was also administered to control coughing and breath holding as well as ocular responses during intubation and during eye operations (DRENGER, et al. 1986 and FENTON, 1986).

It was aimed to study the concurrent administration of Lidocaine Hcl (2% solution) as a bolus dose before thiopental sodium anaesthesia in donkeys.

MATERIAL and METHODS

Sixteen donkeys (15 males and one female), aging one to three years, and weighting 60 to 120 Kg. were used in this investigation. They were divided into four groups; each of four animals.

Food was withheld 12 hours prior to the administration of the drugs. The animals of group I were intravenously injected thiopental sodium freshly prepared 5% solution till the stage of surgical anaesthesia was reached. The animals of the other groups were given Lidocaine Hcl intravenously 3 minutes before thiopental injection into the jugular vein of the other side. The dose rates of Lidocaine Hcl were: 2, 3 and 4 mg/kg B.Wt, for group II, III and IV respectively.

The different reflexes were evaluated and the changes in rectal temperature, heart rate and respiratory rate were recorded before the drugs administration and after 5, 10, 15, 30, 45, 60, 75 and 90 minutes after thiopental injection. The animals reactions during the induction and recovery periods were also recorded.

RESULTS

Group I:

The animals laid down during the administration of thiopental where injection was completed in the recumbent animals. The anaesthetic dose of thiopental was 13.80 mg/kg. B.Wt. (mean value).

While the skin reflex, lid reflex, conjunctival reflex, and coronary band reflex disappeared, the corneal and anal reflexes still, but progressively depressed. The reflexes reappeared after 11-13 minutes. The animals tried to raise the heads within 20-30 minutes, and took the sternal recumbency 30-43 minutes after thiopental injection. They could stand up with the aid of human assistance 40-70 minutes after the drug administration. While induction was smooth, the animals strike their heads to the ground during the recovery period.

LIDOCAINE/THIOPENTAL ANAESTHESIA

Group II:

No excitatory reactions were recorded after administration of Lidocaine Hcl in a dose rate of 2 mg/kg. B.Wt. The anaesthetic dose of thiopental was 12.95 mg/kg B.Wt. The reflexes reappeared within 15-25 minutes after thiopental administration. The animals tried to raise their heads after 30-42 minutes. They were cautious in moving their heads and avoided striking them to the ground. They could take the sternal recumbency after 40-45 minutes and were able to stand up after 45-65 minutes from thiopental injection.

Group III:

Slight convulsions for 1-2 minutes were observed after the intravenous administration of Lidocaine Hcl at a dose rate of 3 mg/kg. B.Wt. in 3 animals. The anaesthetic dose of thiopental was 12.5 mg/kg. B.Wt. The reflexes reappeared within 20-25 minutes and the animals tried to raise the heads cautiously within 28-40 minutes after thiopental injection. They could stand up 42-48 minutes after the anaesthetic administration.

Group IV:

Convulsions for 1-3 minutes were recorded in all animals after administration of Lidocaine Hcl in a dose rate of 4 mg/kg. B.Wt. The anaesthetic dose of thiopental was 10.54 mg/kg. B.Wt. The reflexes reappeared within 20-30 minutes and the animals tried to raise their heads 32-36 minutes after the anaesthetic injection. They could stand up with human assistance within 35-45 minutes.

The changes in the body temperature, heart rate, and respiratory rate are shown in table (1) and Fig. (1, 2 & 3). While the body temperature slightly increased after thiopental injection, it decreased when the drug was administered after Lidocaine Hcl. While the heart rate increased in all groups, the respiratory rate decreased, but returned to fluctuate around the normal values within 90 minutes.

DISCUSSION

Intravenous local analgesics have been incorporated in many anaesthetic regimens to gain several advantages, including depression of laryngeal reflexes, little or no cardiovascular depression, good skeletal muscle relaxation, marked potentiation of nondepolarising muscle relaxants and no known toxic effects such as liver or kidney problems. Moreover, Lidocaine also has a myocardial protective effect in blocking epinephrine-induced arrhythmias in anaesthetized animals (USUBIAGA and WIKINSKI, 1964; USUBIAGA, *et al.* 1969; CHAPIN, *et al.* 1980; WHOELER, *et al.* 1980; WILKINSON, *et al.* 1980; RAWLINGS, *et al.* 1983 and SHARMA, *et al.* 1983).

While it was recorded by SHARMA, et al. (1983) that there was a significant increase in heart rate and respiratory rate when Procaine Hcl was used as a maintenance agent for thiopental anaesthesia, the present results showed no much difference in the heart rate between the various groups.

Induction of anaesthesia with thiopental after Lidocaine Hcl administration was consistent, smooth and efficacious. The dose of the anaesthetic decreased. While the duration of anaesthesia was prolonged, the time to regain full consciousness to stand up was shortened. Moreover, the recovery was improved, where the patients had a good control of their movements.

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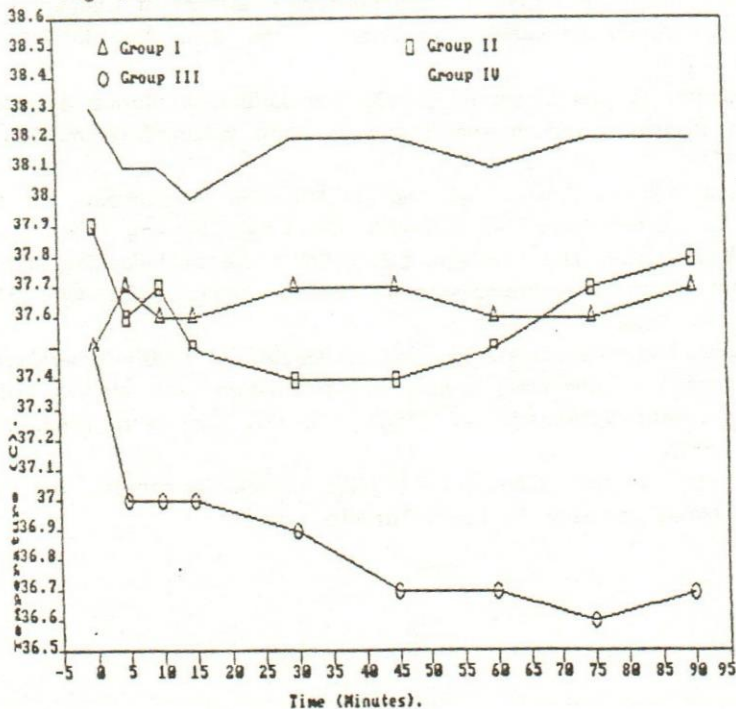
LIDOCAINE/THIOPENTAL ANAESTHESIA

Table (1)

Mean values of body temperature (T), heart rate (HR) and respiratory rate (RR) during thiopental (Group I) and Lidocaine/thiopental (Group II, III, IV) anaesthesia

Time (Minutes)	Group I			Group II			Group III			Group IV		
	T.	HR.	RR.	T.	HR.	RR.	T.	HR.	RR.	T.	HR.	RR.
0	37.5	39	23	37.9	46	20	37.5	44	40	38.3	41	26
5	37.7	64	13	37.6	63	16	37	65	13	38.1	67	8
10	37.6	66	15	37.7	64	15	37	68	12	38.1	65	12
15	37.6	69	14	37.5	63	15	37	65	15	38	61	15
30	37.7	64	16	37.4	63	15	36.9	63	18	38.2	63	22
45	37.7	61	17	37.4	59	16	36.7	56	20	38.2	60	22
60	37.6	48	16	37.5	60	18	36.7	55	25	38.1	54	24
75	37.6	47	18	37.7	54	17	36.6	49	24	38.2	50	23
90	37.7	42	20	37.8	50	18	36.7	46	25	38.2	47	24

Fig. (1): Effect of anaesthesia on body temperature.



H.A. YOUSSEF, et al.

Fig. (2): Effect of anaesthesia on heart rate.

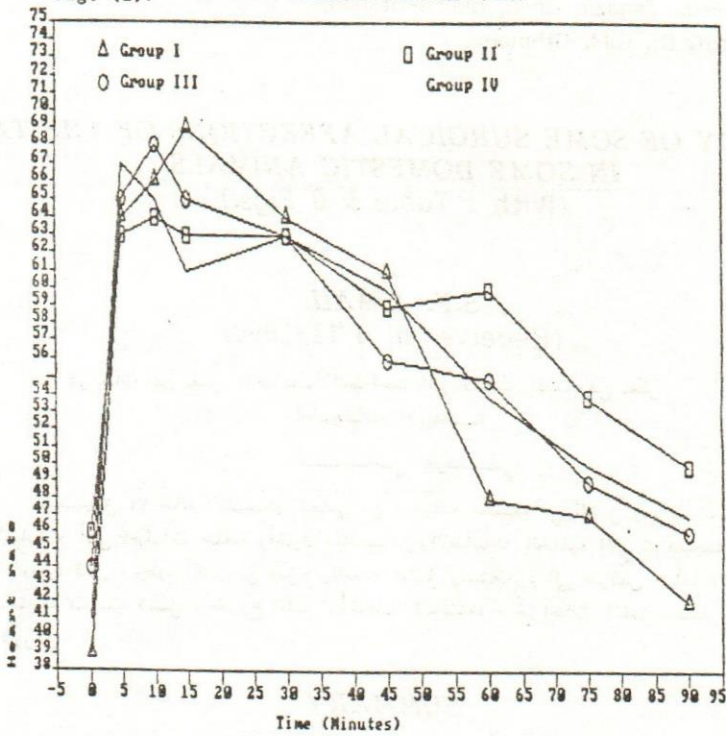


Fig. (3): Effect of anaesthesia on respiratory rate.

