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Xylazine with Glycopyrrolate and Diazepam for Premedication in Thiopental Aathesia in Dogs

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Abstract

The study was conducted on 12 adult female dogs of different breeds, age and weight present at the department of Veterinary Surgery and Radiology of Bihar Veterinary College, Patna for routine surgery which includes cases of ovary hysterectomy, pyometra or uterine infection. All the dogs were randomly divided into 2 groups each containing six animals. Animals of group I were premedicated by administration of Glycopyrrolate @ 0.011mg/kg b.wt. i/m followed by Diazepam @ 0.5 mg/kg b.wt. i/v. In group II were administered Glycopyrrolate and xylazine @ 0.011mg/kg b.wt. i/m and 1.0mg/kg b.wt. i/mrespectively after 15 minutes diazepam was administered intravenously. In the both groups thiopental was administered @ 10 mg/kg b.wt. i/v for induction and maintenance of general anaesthesia after 2 minutes of premedication. The evaluation of anaesthesia was made on the basis of clinical examination, haematological evaluation, biochemical evaluation and physiological evaluation before and after pre anaesthesia, and during recovery periods .The s 0.38). The duration of anaesthesia was found prolong in group II dogs (49.11 ± 6.67 min) than group I (39.52 ± 4.96). But the recovery time was found less in group II dogs (68.00 ± 3.89min) than in the group I (76.83 ± 5.26 min). The analgesia and sedation scores were found more in group II dogs than in the group I . The total dose (in ml) of thiopental for induction and maintenance was found less in group II dogs (4.51 ± 0.99) than in the group I (8.35 ±1.23).Xylazine with glycopyrrolate and diazepam combination as pre-anaesthetic medication with thiopental anaesthesia produce adequate anaesthesia used for induction and maintenance of anaesthesia in dogs.

Introduction

A variety of injectable anaesthetic drugs can be used to induce general anaesthesia and chemical restraint in animals. Proper use of pre-anaesthetic effects. No single anaesthetic drug produces all of the components of general anaesthesia without depressing some vital organ function so, a multiple drug approach (balanced anaesthesia) is exploited to diminish sensory, motor sympathetic and parasympathetic reflex activity, and to attenuate individual components of the anaesthetic state (1, 2). The development of balanced anaesthesia is the key for achieving safe and satisfactory anaesthesia in diverse nature of surgical ailments. Scientist developed varieties of anaesthetics for performing different surgical procedures in different species of animals, they differ uniformity in action, doses and some create complications or produce toxicity or sometimes will be costly. All the small animal surgical procedures are being conducted under general anaesthesia, which may result in complications like toxicity, late recovery, hypotension, respiratory depression and individual idiosyncrasy. However, administration of premedication proved to produce the dose but also the adverse effects of the general anaesthesia. Hence various agents like xylazine, glycopyrrolate, diazepam have been used as premedicants to minimise the complications of general anaesthetic used. The injectible anaesthetics offer several advantages over inhalation anaesthetic like they produce easy and very rapid induction of anaesthesia. They do not require costly and specialized equipments for administration.

Materials and Methods

Animals of group I were pre-medicated by administration of glycopyrrolate @ 0.011 mg/kg b.wt. i.m., followed by Diazepam @ 0.5 mg/kg b.wt.i.v. after 15 minutes and in group II Glycopyrrolate and Xylazine @ 1.0mg/kg b.wt. and diazepam were administered by intravenous route after 15 minutes.

Twelve adult dogs of different breed which were clinically unhealthy i.e. uterine infection presented in the clinics. Dogs were randomly divided in two groups of six animal each. In haematological observations TEC, TLC, Hbwere recorded. In biochemical observations SGPT, SGOT, BUN and creatinine calculated. In clinical observations sedation, recovery time, duration surgical anaesthesia analgesia, depth of anaesthesia measured.

Results and Discussion

The present work was carried out to study various clinical, haematological, biochemical, and pulse oximetric alterations following the two different preanaesthetic combinations with thiopental at different time interval in dogs. The pharmakinetics of thiopental sodium viz., rapid distribution, ultra-short action, rapid metabolism by the liver and rapid reduction in the arterial concentration makes it suitable for total intravenous anaesthesia.

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In group I and II the diastolic blood pressure decreased significantly during anaesthesia as compared to different periods of interval. In comparison between groups I and II diastolic blood pressure after different premedication, significantly decreased in group I. Systolic blood pressure. The systolic blood pressure is determined a combination of peripheral vascular resistance, stroke volume and intravascular volume, whereas diastolic blood pressure primarily arises from peripheral vascular resistance. In group I and II Capillary refill time during recovery was significantly lower as compared to different breeds of intervals. The comparison between Group I and II capillary refill time after pre-medication was significantly higher in group II than I. The increased capillary refill time noticed may be due to the thiopental vasodilation effect and the loss of muscle tone produced by midazolam-xylazine (2). Similar effect was noted by (4) in dogs with glycopyrrolate-xylazine combinations.

Biochemical Observation : In group I non-significant difference of SGPT was observed during anaesthesia and during recovery but both values were significantly higher than before pre-medication and after pre-medication period. In group II non-significant difference was observed after pre-medication and during anaesthesia but both values was significantly lower than during recovery and significantly higher than pre-medication. In comparison between group I and group II SGPT value of group II was significantly higher as compared to group I.

In group I non-significant difference of SGOT was observed during anaesthesia and during recovery but both values was significantly higher than before pre-medication and after pre-medication period. In group II non-significant difference was observed during anaesthesia and during recovery but both values was significantly higher than before pre-medication and after pre-medication. Least SGOT value was found before pre-medication period.

In group I non-significant difference of BUN was observed before premedication and after pre-medication but blood urea nitrogen value was significantly increasing during anaesthesia and during recovery. In group II BUN values significantly increased after pre-medication during anaesthesia and during recovery.

Creatinine in group I and II non-significant differences were observed during anaesthesia and during recovery but both values was significantly higher than before pre-medication and after pre-medication. In comparison between group I and group II creatinine value did not differ significantly at different period of interval. (5) stated that barbiturates were known to alter the normal physiological system especially hepatic and renal function in man and laboratory animals. (6) reported increased levels of serum urea nitrogen in goats anaesthetised with a sedative and thiopentone combination. (7) recorded significant increase in BUN values during thiopentone anaesthesia in detomidine pre medicated dogs. The fluctuation in creatinine values had no consequence since values were with in normal units in both anaesthetic combinations. Similar findings were also reported by (8,9,10).

Haematological Observations : In group I and II haemoglobin decreased significantly during anaesthesia as compared to before pre-medication period. The comparison between group I and II no significant difference was observed in haemoglobin at different periods of interval. In group I non-significant difference was observed during anaesthesia and during recovery but both values were significantly lower than before pre-medication and after pre-medication period. TLC in group I non-significant difference was observed during anaesthesia and during recovery but these values were significantly lower as compared to before pre-medication and after pre-medication period. The comparison between group I and II non-significant difference was observed at different periods of interval. The comparison between group I and II TEC after premedication and during anaesthesia was significantly lower in group II as compared to group I. Haemoglobin, PCV, TEC and TLC decreased significantly in both groups during anaesthetic period. Pooling of circulatory blood cells in the spleen or other reservoirs secondary to sympathetic activity may explain the decrease in Hb, PCV, TEC and TLC recorded in the present study (11).

Clinical observation showed that induction of anaesthesia was smooth in both groups. The induction time of anaesthesia was found quicker in group II (1.89±0.34 min.) than in group I (2.78±0.38). The depth anaesthesia was satisfactory in group II, but was not satisfactory in all the animals of group I. The duration of anaesthesia was prolonged I group II (49.11±6.67) than group I (39.52±4.96). Recovery time was found less in group II than group I. The analgesia score was found more in group II dogs than in group I. The sedation score was found more in group II than group I. The total dose of thiopental for induction and maintenance was found less in group II than group I. In group I and II the eye balls were fix downward during anaesthesia, and fix centrally positioned during recovery as well as before premedication. In group I, the corneal, pedal, palpebral and cutaneous reflexes were present after preanaesthetics drug administration. During anaesthesia all reflexes were absent and during recovery all reflexes were present.

Table-1 : Mean ± S.E. of different parameters at different time interval Biochemical Parameters.

Group	Premedication		During Anaesthesia	During Recovery
	Before	After		
		SGPT (U/L)		
1	16.35 ± 1.10^{am}	16.48 ± 1.10^{am}	22.55 ± 1.06^{bm}	24.60 ± 1.10^{bm}
2	21.05 ± 0.66^{an}	25.48 ± 0.49^{bn}	27.10 ± 0.67^{bcn}	28.85 ± 0.65^{cn}
		SGOT (U/L)		
1	28.84 ± 0.76^{am}	29.68 ± 0.65^{am}	34.78 ± 0.34^{bm}	35.0.40^{bm}
2	25.44 ± 0.59^{an}	29.97 ± 0.80^{bm}	35.11 ± 0.38^{cm}	36.38 ± 0.51^{cm}
		BUN (mg/dl)		
1	25.93 ± 0.57^{am}	26.39 ± 0.58^{am}	31.03 ± 0.57^{bm}	32.77 ± 0.35^{cm}
2	25.76 ± 0.61^{am}	29.22 ± 0.64^{bn}	33.46 ± 0.67^{cn}	35.42 ± 0.41^{dn}
		Serum Creatinine (mg/dl)		
1	0.65 ± 0.016^{am}	0.67 ± 0.016^{am}	0.72 ± 0.016^{bm}	0.74 ± 0.018^{bm}
2	0.64 ± 0.014^{am}	0.67 ± 0.013^{am}	0.75 ± 0.021^{bm}	0.78 ± 0.020^{bm}

Values bearing same superscript in a row (a-d) & column (m-n) did not differ significantly (P>0.05)

Table-2 : Mean ± S.E. of different parameters at different time interval Hematological Parameters.

Group	Premedication		During Anaesthesia	During Recovery
	Before	After		
		Haemoglobin (gm/dl)		
1	12.80 ± 0.28^{bm}	12.65 ± 0.29^{abm}	11.88 ± 0.23^{am}	12.17 ± 0.25^{abm}
2	12.79 ± 0.28^{am}	12.21 ± 0.30^{abm}	11.79 ± 0.27^{bm}	12.25 ± 0.30^{abm}
		PCV (%)		
1	39.69 ± 72^{bm}	39.37 ± 0.79^{bm}	35.21 ± 0.32^{am}	36.87 ± 0.42^{am}
2	39.62 ± 0.50^{cm}	39.08 ± 0.54^{cm}	34.63 ± 0.38^{am}	37.05 ± 0.11^{bm}
		TLC (103/cmm)		
1	15.27 ± 0.45^{bm}	15.21 ± 0.44^{bm}	13.43 ± 0.35^{am}	13.77 ± 0.32^{am}
2	15.15 ± 0.51^{bm}	14.98 ± 0.54^{bm}	13.34 ± 0.47^{am}	13.91 ± 0.50^{abm}
		TLC (106/cmm)		
1	6.95 ± 0.037^{bm}	6.94 ± 0.036^{bm}	6.79 ± 0.027^{am}	6.85 ± 0.043^{abm}
2	7.00 ± 0.022^{cm}	6.76 ±0.032^{bn}	6.49 ± 0.071^{an}	6.72 ± 0.061^{bm}

Values bearing same superscript in a row (a-d) & column (m-n) did not differ significantly (P>0.05)

Conclusions

Xylazine with glycopyrrolate-diazepam combination as pre-anaesthetic medication with thiopental anaesthesia produce adequate sedation, analgesia, smooth induction and good muscle relaxation in dogs. The depth anaesthesia without xylazine premedication was not found satisfactory for major surgical procedures. But it was satisfactory in xylazine–premedicated dogs. Xylazine has dose sparing effect on thiopental anaesthesia used for induction and maintenance.

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