CHAPTER IV

RESULTS

The mean age and body weight of mules in group XY were 24.2 ± 4.5 months old and 190.6 ± 24.2 kg, respectively and the mean age and body weight of mules in group DET were 27.1 ± 4.2 months old and 210.9 ± 24.3 kg, respectively. There were no significant differences of age and body weight between two groups. After 7 days of acclimatization, all mules showed no sign of excitement when they were brought into the operation area for castration.

Quality of sedation following premedication: Quality of sedation produced by the premedication agents was summarized in table 2. Following the premedication, the mules showed signs of sedation, including lowering their head and ataxia. Although there was no significant difference in the sedation and ataxia scores between groups, the mules of group XY were heavily sedated (mode: score 3) while the mules of group DET were moderately sedated (mode: score 2). In addition, the mules of group XY dropped their head significantly lower than group DET at 2 min after the premedication ($p=0.03$).

Table 2. Qualities of sedation following the intravenous administration of xylazine (1.6 mg/kg) or detomidine (0.03 mg/kg) as a premedication in mules.

	Minutes after the premedication				
	1	2	3	4	5
Sedation score (0-3)					
Xylazine	1 (0-3)	2 (1-3)	3 (2-3)	3 (2-3)	3 (2-3)
Detomidine	1 (0-2)	2 (1-3)	2 (2-3)	2 (2-3)	2 (2-3)
Ataxia score (0-5)					
Xylazine	-	-	-	-	3 (1-3)
Detomidine	-	-	-	-	3 (0-3)
Head lowering ratio					
Xylazine	0.916 ± 0.10	0.619 ± 0.13*	0.519 ± 0.11	0.512 ± 0.14	0.499 ± 0.11
Detomidine	0.906 ± 0.08	0.739 ± 0.08*	0.628 ± 0.07	0.600 ± 0.09	0.574 ± 0.10

* Significant difference (P<0.05) between groups premedicated with xylazine and detomidine. Sedation and ataxia score were shown in mode (range). Head lowering ratio was shown in mean ± S.D. calculated from the height of lateral canthus after premedication divided by the height before premedication.

Qualities of anesthesia and recovery: Qualities of anesthesia and recovery were summarized in table 3. All mules showed sufficient moderate sedation, therefore, no mules received additional dose of xylazine or detomidine before the IV administration of thiopentone. Although 2 mules of group XY and a mule of group DET showed poor induction, the rest were smoothly anesthetized with the IV administration of thiopentone. There was no significant difference in the induction score. The induction time of group XY was half a minute shorter than that of group DET ($p=0.002$).

Table 3. Qualities of thiopental anesthesia following the premedication with an intravenous xylazine (1.6 mg/kg) or detomidine (0.03 mg/kg) in mules.

	Premedicants		*p* value
	Xylazine	Detomidine	
Total amount of thiopentone (mg/kg)	2,384.8 ± 597.6	2,392.5 ± 903.6	0.627
Induction score	4 (0-4)	4 (0-4)	0.575
Maintenance score	1 (1-2)	1 (1-2)	0.125
Recovery score	4 (2-4)	4 (2-4)	1.000
Induction time (sec)	46.1 ± 8.7	76.3 ± 18.4	0.002
Maintenance period (min)	33.7 ± 10.4	30.9 ± 11.1	0.402
Recovery times			
-First movement (min)	24.9 ± 9.9	30.3 ± 6.9	0.171
-Sternal recumbency (min)	39.8 ± 10.4	46.8 ± 10.3	0.135
-Standing (min)	50.7 ± 14.2	59.8 ± 17.5	0.269
Number of attempts			
-to sternal recumbency (times)	1 (1-3)	1 (1-8)	0.886
-to standing (times)	1 (1-10)	2 (1-4)	0.612

All data were shown in mean ± S.D. or mode (range).

Surgical procedures for castration were completed in all mules without complication. The total amounts of thiopentone administered to mules were not significantly different between groups. However, 5 mules of group XY and 2 mules of group DET received total amount of thiopentone exceeding the dose limit for horses (11 mg/kg) to maintain at the stage 3 plane 2 of general anesthesia but did not affect quality of the recovery. Recovery from anesthesia was clinically satisfied in all mules. There was no significant difference in recovery score, duration to recovery, numbers of attempts to sternal recumbency, and standing between groups.

Changes in cardio-respiratory parameters during general anesthesia: Alternation in HR, PR, RR and MABP during general anesthesia for castration were shown as mean and S.D. in figure 8. The point of time that a mule fell down after thiopental induction was assigned as minute 0. All cardio-respiratory measurements of cardio-respiratory function value were performed at Minute 10 and repeated every 5 min until the operation was finished. Slightly bradycardia was found at minute 10 to 20 in both groups. After minute 20, group DET showed slightly tachycardia and came back to baseline level, while group XY was still slightly bradycardia until finishing surgery. However, the HR and PR of both groups were no significant difference between groups at any time points. Both groups had tachypnea and hypertension during the operation. However, all vital signs data of group DET were slightly higher than group XY during the operation but there was no significant difference between groups at any time points.

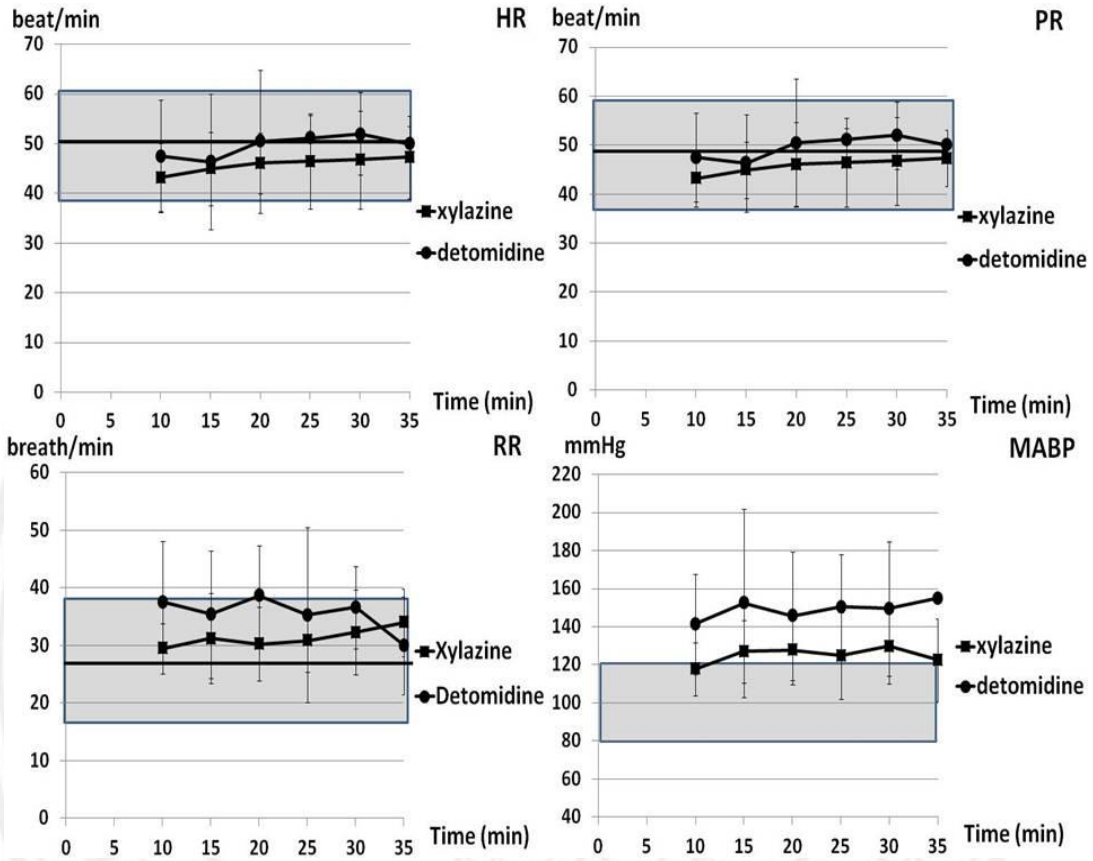

Figure 8. The changes in cardio-respiratory measurements during thiopental anesthesia in mules premedicated with xylazine or detomidine. Changes in mean and S.D. of cardio-respiratory parameters (heart rate; HR, pulse rate; PR, respiratory rate; RR, and mean arterial blood pressure; MABP) during thiopental anesthesia in mules premedicated with xylazine (■; n=9) or detomidine (●; n=9). Minute 0 is the time once a mule falls down after induction. The black straight line in each graph is the mean baseline and the gray zone represents the S.D. of the baseline value. There was no reference baseline of MABP for mules, so the range of normal horse MABP was represents as the gray zone (22).