

Short Communication

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Determination of Critical Dose of Apomorphine for Induction of Emesis in Dogs

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Apomorphine, a known emetic drug which induces emesis by direct central stimulation of chemoreceptor trigger zone (CTZ) of the medulla, was chosen as emetic drug due to its less frequent side effects/reactions. In the literature different doses of apomorphine have been reported to induce emesis in humans and experimental animals (1-9). A dose of 1mg/kg body weight of apomorphine was administered subcutaneously which proved excessive and induced uncontrollable vomiting, rapid respiration, ataxia, restlessness and convulsion within one minute of injecting subcutaneously. Therefore, the dose of apomorphine was decreased gradually, until a critical dose was reached which induced emesis in every dog within 5-10 min., below this dose some animal tolerated the medication and became sedated,

drowsy and went into sleep without emesis. In an earlier study¹⁰, we have shown that the emesis induced by administration of 0.044mg/kg apomorphine subcutaneously to dogs was prevented not only by a centrally acting dopamine antagonist, chlorpromazine but also by metoclopramide. Further, it has also been observed¹¹ that the amount of chlorpromazine and metoclopramide required to prevent emesis caused by administration of 0.044mg/kg of apomorphine is very close to the recommended dose of these drugs for human beings, thus the usability of animal model in this study is justified. Two male and two female Mongrel dogs were given active apomorphine while one male and one female acted as control, receiving placebo. The dogs were kept under observation for one week prior to commencing the experiments. Each dog was fed six slices of bread soaked in milk. After one hour of feeding test animals were given different doses of apomorphine dissolved in distilled water and controls were given distilled water only in the same quantity and responses were noted (Table 1).

Table 1 indicates that subcutaneous administration of different doses of apomorphine resulted in different behaviour patterns in test animals; 1mg, 0.66mg, 0.5mg, 0.33mg, 0.133mg, 0.066mg and 0.044mg/kg body weight induced emesis in all test animals, while after the lowest dose

TABLE 1. EMETIC EFFECT OF APOMORPHINE AT DIFFERENT DOSES IN DOGS

Dose of apomorphine mg/kg*	Different behaviour of experimental animals (dogs) after injecting the apomorphine	Time in minutes after injecting the apomorphine	Exp. Animals		Control	
			Emesis +ve	Emesis -ve	Emesis +ve	Emesis -ve
1.00	The animal showed persistent nausea, vomiting, irregular rapid respiration, ataxia, tremor and convulsion.	0-1	4	-	Nil	2
0.66	Persistent nausea, vomiting, irregular rapid respiration, ataxia, restlessness and convulsion.	0-1	4	-	Nil	2
0.5	Persistent nausea, vomiting, irregular rapid respiration, thirst, fainting and restlessness.	0-1	4	-	Nil	2
0.33	Persistent nausea and vomiting, irregular rapid respiration, tachycardia, thirst, ataxia, fainting and restlessness.	0-1	4	-	Nil	2
0.133	Persistent nausea, vomiting, rapid respiration, tachycardia, thirst, restlessness and sleep.	1-2	4	-	Nil	2
0.066	Intermittent vomiting, rapid respiration, tachycardia and thirst.	2-5	4	-	Nil	2
0.044	Twice or thrice vomiting, abdominal contraction and vomiting, calm and quite.	5-10	4	-	Nil	2
0.033	Abdominal contraction, vomiting, calm and quite. One animal remained quite normal.	10-45	3	1	Nil	2
0.030	Vomiting, sedation, calm & quite and nausea.	20-60	2	2	Nil	2
0.020	Calm and quite, sleep, nausea and vomiting.	30-70	1	3	Nil	2

*A time interval of 24 hr. was maintained between testing of different doses.

of apomorphine, 0.020mg/kg, 1 dog vomited and 3 showed no emesis. None of the control animal vomited.

It is concluded that a dose of 0.044mg/kg body weight of apomorphine given subcutaneously causes a reliable emetic effect in 5-10 min. However, larger doses cause emetic effect alongwith abnormal behaviour, and lower doses than 0.044mg/kg do not produce an emetic effect in all experimental animals.

Therefore, the administration of apomorphine by the subcutaneous route at a dose of 0.044mg/kg body weight has a reliable and satisfactory emetic action, with the animals returning to normal within 40 min.

Key words: Apomorphine, Emesis and critical dose.

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