

6-hydroxydopamine

Apomorphine

Chronological Changes in the Rotational Behavior in Response to Apomorphine Administration in 6-Hydroxydopamine Parkinsonian Rat

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Background : Apomorphine-induced rotational behavior of unilateral 6-hydroxydopamine(6-OHDA) lesioned rat is widely used to develop anti-Parkinsonian treatments including drugs, neuroprotective therapy, and neural graft. Time course of changes in rotational behavior after lesioning, however, has not been fully elucidated. The aim of this study was to observe the chronological changes in the rotational response and to find out the optimal period when this model is used for investigation of various therapies. **Methods :** 6-OHDA was stereotactically delivered to the unilateral substantia nigra in 13 rats. Rotational responses to apomorphine administrations were counted in the rotomotor on 2, 4, 8, 12, and 14 weeks after lesioning. **Results :** The total turns for two hours increased continuously up to eight weeks, and then plateaued. **Conclusions :** Apomorphine-induced rotations increase until eight weeks after 6-OHDA lesioning. Therefore, this Parkinsonian model should be used at least eight weeks after lesioning. Even though priming was not excluded as an explanation in the experiment, we reason that progressive degeneration of dopaminergic neurons may explain the chronological changes in rotational behavior.

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Key Words : 6-hydroxydopamine, Rotational behavior, Apomorphine

dopamine	levo-dopa	(stereotaxic method)	6-hydroxydopa-
가	가	mine(6-OHDA)	(reliability)가
가	levo-dopa	dopamine	dopamine
dopamine		,	,
protective therapy)		dopamine	dopamine
dopamine	catecholamine		

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6-OHDA	dopamine	dopamine
	,	
	dopamine	
D1	D2	
phine		dopamine
		(denervation supersensitivity)

dopamine	3.	2, 4, 8, 12, 14	apomorphine(0.5mg/kg,
6-OHDA	8,9 apomorphine) 5	120
dopamine	4.	2 4 , 4 8 , 8 12 , 12	
apomorphine	14	120	mixed
.	6-OHDA	model	.
2 가	.	120	random
apomorphine	6-OHDA	effect modeling	.
,	rotation	1.	
Ungerstedt	8 apomorphine	2, 4, 8, 12, 14	,
.	.	120	
가	가	가	(p>0.05)(Fig. 1).
,	가	2. 120	
가	120	13	2
kg) 1. 6-OHDA	671±61 , 4	1108±75 , 8	1418±135 , 12
200-250g Sprague-Dawley	1275±129, 14	1289±124	.
catecholamine	dopamine	2 4 , 4 8	
.	noradrenaline	(p<0.05)	8 12 , 12 14
desipramine(12.5mg/kg)	desipramine(12.5mg/kg)	(p>0.05)(Fig. 2).	
kg) pargyline(25mg/kg)	20		
.	pentothal sodium(25mg/kg)	apomorphine	2
,	8	가	,
(stereotaxic instrumental device, David-Kopf frame)	14		
2cm 가	.	apomorphine	.
.	8		
Hamilton	.		
syringe	0.2% ascorbic acid	2 4	
OHDA 8μg/4μl	, ventral	.	
midbrain Paxinos Watson atlas ¹⁰	.	Ungerstedt	apomorphine
AP +0.24, L +0.16, DV -2.75mm	.	8	2
6-OHDA가 4	.	가	가
.	4	4	가
2.	가	121 (17)	,
.	.	apomorphine	
hemi-Parkinsonism	1/2 0.25mg/kg	1/2 0.25mg/kg	,
2 가 apo-	apomorphine	8	
morphine(0.5mg/kg,)	가	“prim-	
가 .	rotomotor가	ing” ,	apomorphine
perplex apo-	apomor-	apomorphine	가
aphine 1 300	가	가	.
13	11	amphetamine	amphetamine
가	12	priming	,
.	12	priming	5

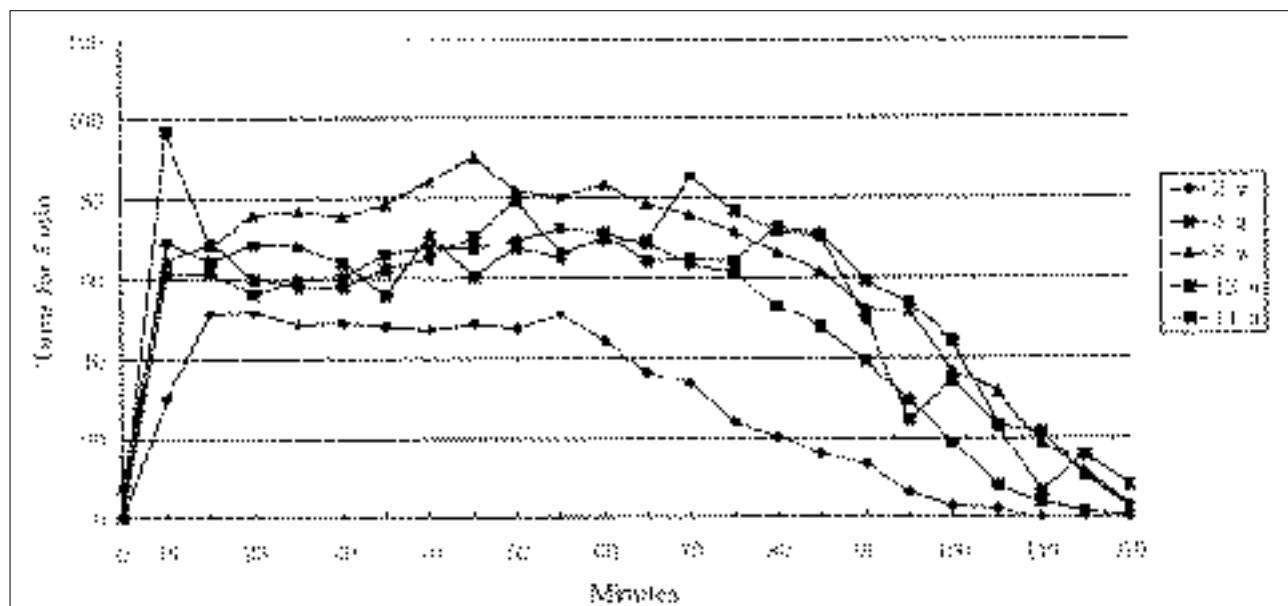


Figure 1. There were no significant differences in the pattern of turns during 2 hours between each week ($p>0.05$). The random effect modeling was used for test.

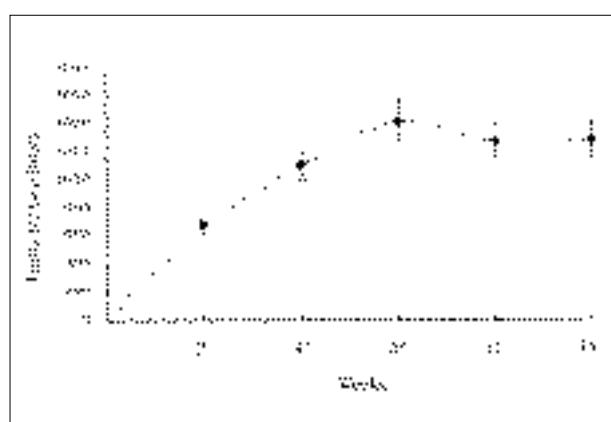


Figure 2. Total turns for 2 hours in response to apomorphine showed significant differences between 2 and 4 week, 4 and 8 week (*: $p<0.05$), but there were no significant differences between 8 and 12 week, 12 and 14 week ($p>0.05$). Comparison of means by mixed model was used for test.

OHDA
 dopamine
 가
 가
 D2
 upregulation)
 phine
 가
 가
 D2
 2-3
 가
 1
^{13,15,16},
 dopamine
 4
 120
¹⁴가
 4
 8
 가
 6-OHDA
 2-3
 dopamine
¹⁶ tyrosine hydroxylase(TH)
 1
 2
¹⁷
 2
 TH
 6-OHDA
 dopamine
 phenotypic expression
 silver impregnation
 6-OHDA
 60

6-OHDA
 agonist SKF-38393
 Morelli et al¹²
 phine priming 3
 apomorphine priming
 , 4
 4 8
 priming
 , 12 14
 priming
 가

dopamine
 apomorphine
 priming
 가
 12
 8 12
 가
 6-

		dopamine	
60		,	
6-OHDA		,	6-
OHDA	Nissle	locus ceruleus	
noradrenaline		48	
30		,	¹⁹
6-OHDA		Fluoro-gold	
가 2	16		
20		, 6-OHDA	
		apomorphine	
		,	⁹
	4 , 8		가
6-OHDA		apomorphine	
dopamine		가	
가		8	
가	,	가	
8			
		가	
priming	dopamine	,	
	dopamine	,	
apomorphine		priming	
가		가	

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