

A K K S S K S K S S S



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A P P E A L I C L E I N F

A B A C

Keywords:

Keywords:

D2/3 K

A K , K

Introduction: K K K K K s K s S S S
 s s (D) . H w , K s w s s s K K w K s K K
 K s K K s K s D K K K K
 s versus s K D K K w K s K s K K K

Results: D K K K K K s S K S K s s w s K K K s.
 K K K K s K K s K K s K K s K K s K K s K K s
 K K s K K s K K s K K s K K s K K s K K s K K s
 K K s K K s K K s K K s K K s K K s K K s K K s
 K K s K K s K K s K K s K K s K K s K K s K K s

Conclusion: S K K s D s s K s K W -s fi K K
s K K s . . . s fi - s s s K fi K K . . . s
K K s . . .

1. Introduction

K K K K s K s K s (D). S) E s K s K , K K K K K K
 M K - D K K W K s K K K K K X ss K s K s K s K K K K K K
 K K s K
 1-3 . ss ffi K s K K K K K K K K K K K K K K K K K K K
 s K s x s 45 . s w s s K K K K K K K K K K K K K K K K K K

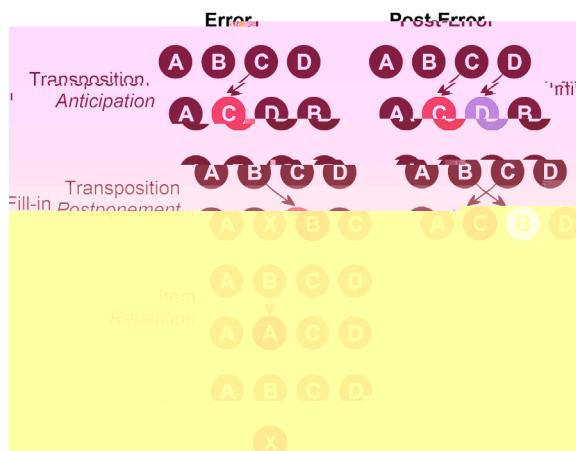


Fig. 1. E K s X s F X , K w s K K K

K s s K s K s K . . .
 w . . . w . . . s s K s (. . , s K)
 7 , K s s K s K w K K K K K s s K)
 A K K K K s K s K s K K K K K K K K
 K K K K K K K K K K K K K K K K K K
 (fi , . . , K i K K K i + 1) K K K K K K K K
 ws K K K K K K K K (fi , . . , K i
 + 2 K K i + 1) . s K s s s s s s s . K
 fi - K fi s s s s s K v 2:1 4:1
 s 9,10 s s s 11 .
 K s s K s K s K . . .
 s K w s s s K K . . . K w
 s K K s K K K w K w K w K
 s K . . . fi - s . K
 K s K s K s s s s s s s s s s s s s s
 ss 12 . K s s K K s s s K s s s s s s
 K K K K s s K K s s K K s s K K s s s s
 s K s K K K K s s K K s s K K s s s s
 K w s K s K K . s s s s s s s s K K
 ss s . A K K K K K s K K K s s s s K K
 K s s s , s K K K s s K s K s K s s K
 s K K K K K K K K K i + 1 s K s s K
 K i w s K K K K K i + 2 K K K K K
 s K .
 D ff K K s fl K ff K s . H
 w . K K K K K s (D - A) versus K s w K s K
 K
 K
 D . F s K w s K s s K v K s s s K
 K s . A K s s K w K w K w s s K
 K s K , w s K w K w K w s s K
 K . . . K s K s s K s s K s s K
 K s K D - A , K s s K s s K s s K
 w K K K K K s K v s K K s K D -
 A , w K s s K s s K s s K s s K
 s , w K w K fi - s K v fi - s K
 D - A , w K s s K s s K s s K s s K
 s K K K ff K D 2/3 K s s K
 s . s s K s s w D 2/3 K - K
 K s . K K K K K 13 . I K , w
 x K K K K K v K K K K K K K K K K
 K K fi - s K K K s K D 2/3 K
 s K .

2. Methods

s sK w s K K K
 s K H s K w K K D K
 H s E K Ks w K s K

2.1. Patients and clinical assessment

	s	132	K	N	w	K	K	D	(K)	s	s
D	s	s	K	B	B	C	D	s	K	C	K
w	s	K	H	s	K	D	K	K	N	I	s
w	1)	s	w	K	H	D	K	fi	s; 2) H	-	-
w	1-3; 3)	50-80	s; 4)	K	≥ 9	s.	E	s	K	-	-
w	1)	s	K	s	, s	K	-	-	; 2) ss	-	-
K	(M	K	C	K	Ass	ss	K	M	CA < 21/30)	K	-
K	s	K	s	K	s	(.,	s	K	)	K	K
K	s	H	(.,	K	); 3)	ss	K	ss	(B	-	-
D	ss	I	K	II,	BDI-II > 7)	K	K	ss	H	(.,	-
s	K	).	F	K	s	D	K	w	K	ss.	-
A	K	N	w	ss	ss	K	-	K	s	-	s,
,	,	,	x	,	,	s	,	K	,	-	-
K	.	I	K	N	K	K	K	s	K	-	-
K	s	, w	K	K	K	-	K	s	D2/3	-	-
K	s	H	K	N	K	ss	ff	K	14	.	-
s	K	K	s	K	w	s	ss	ss	w	K	fi
s	s	D	s	s	K	(	D	) III	(	K	w
K	s	K	M	K	D	s	K	s	D	-	s
K	K	K	K	C	w	K	s	K	w	-	-
G	.	K	w	s	K	w	K	K	M	C.A.	F
L	I	ss	ss	K	s	K	K	K	(MCI)	-	-
D	15,16	,	w	s	K	K	K	K	D	(N = 30,	-
M	CA $\geq 26/30)$	.	D-MCI	-	-	-	-	-	(N = 27,	21 \leq M CA $\leq 25)$.	-
K	s	,	K	s	K	K	K	w	,	K	-
w	,	K	s	w	,	,	fl	K	s	K	-
K	K	s	w	ss	ss	w	K	K	N	-M	K
K	,	EM	B	D	s	-	K	s	s	K	,
E	w	K	,	I	s	K	I	X	-	-	-

2.2. Healthy control subjects

H 40 H H w sK s -
fi K s K s s. K K s.
ss ss K K K - K K s s K K

2.3. Working memory tests and error types

A K K K K K D -A 17 Ks
w. Ks K K D -A, K K K K K w s K
K K K K K w s K K K K K
K s . s Ks K s K K Ks -
w. Ks K K K () K w s K K K K K s
s K K K K w K K K s K
s ; () K w s s K s K s K s .
K K s s s w f i K K K K K K K K K
. K s K s K K 18 s K K K w s
K K K K K K K s K K s s
K s w s s K K K K K K .
s w s s f i s K s s K K s (F. 1). A
K s s K w K w s K
s K , w s K w K w s K
. s s K s w K K K s K
K s. A K K w K w s K
K , w s s K K w w
K w s K K F K K s. w K

sK sK , . w K K w s w K K K
 K (fi -) K K K w K K K
 K K K (fi). K K s w K K K
 K K K s. A K K w s K K
 K s fl K s s s ss fi K
 w s s (M. . .) K s K I
 fi K K s K s s K K
 K , K w s K s s s K
 s s. K s s w s ss K 0.7%
 K K sK

2.4. Statistical analysis

K K K s s s -
 fi K sK B s s w K JA . F
 K , K K w s K s s K K
 s s s K s s K s K
 s s AN As. AN A w K -s K K sK(D
 A, w), K v -s K K G (D, D-MCI, K
 K), K A K K K v sK G
 w s w K v -s t-KsK (K v -K), B K
 K s p < 0.025).
 F K s s K s w K v w K K
 sK K s s fi fi s ff K v
 s. F K s s w w K s s AN As
 K v sK G s K s A s K
 fi K ff K D2/3 K sK
 K K K s D2/3 K s K s K
 K K s p < 0.013).
 K s w K

3. Results

3.1. Test scores

1 s ws K s -
 s s K K K K K s.
 w AN A ff K K D -A w K sK
 C sK K w K s sK 6, D K K w K
 K s w K K K s K D -A (ws
 s , p < 0.001) K K K w K sK D-MCI K K
 s w K K s K s K s (D -A: p < 0.001;
 w : p = 0.001).

3.2. Error types

H fi s fi , w K K
 ff K s s K s s AN As w K sK
 G s K s A s K F 2A s K K
 K K s s K s s K s s
 K s K AN A s fi K K K K v sK
 G (F(2,93) = 7.48, p = 0.001, $\eta^2 = 0.14$) K K K
 ff K G (F(2,93) = 4.61, p = 0.012, $\eta^2 = 0.09$). sK t-
 K s K s K s K s K s s
 K s K s K s K s K D -A (D: t(68) = 2.44,
 p = 0.017; D-MCI: t(65) = 5.47, p < 0.001) K K K w
 K s K w s ff K K s s ff K (ps > 0.22).
 s s K w fi B s s (2).
 F 2B s K K K K K sK K
 s. B K K K K K s K K K s s
 K s K K K K K F K K K s K w s
 s fi K K K K v sK G (F(2,93) = 4.95,
 p = 0.009, $\eta^2 = 0.10$) K K K ff K G (F
 (2,93) = 5.17, p = 0.007, $\eta^2 = 0.10$). B K D D-MCI K K
 K K s K K K s K D -A (D:
 t(68) = 2.77, p = 0.007; D-MCI: t(65) = 4.30, p < 0.001) K K
 K w K s K w s ff K sK K s
 ff K (ps > 0.21).
 F 2C s K K K fi - fi s. B K -
 K K K K K s K K K K K w s s

Table 1

		D	H s, s	s	s s (	s, sK	H s,	ff	s).			
F	K	s/M	s	s	D (N = 30)	D-MCI (N = 27)	H	K s (N = 40)	G	ff	s (p	s)
M : F					16:14	16:11						
A (s)					67.6 (7.0)	71.9 (8.0)						
E (s)					14.6 (2.7)	14.2 (3.8)						
<i>Motor symptoms</i>												
D K s s (s)					1.9 (1.8)	2.3 (1.8)						
H					2.0 (0.6)	2.1 (0.5)						
D III: M K					12.1 (4.6)	10.8 (3.0)						
<i>Cognition</i>												
M CA					27.4 (1.2)	24.1 (1.0)						
A K K					5.4 (2.2)	3.8 (1.7)						
D K s w					7.5 (1.2)	7.0 (1.2)						
D K s w					4.5 (1.1)	4.1 (1.0)						
A fl					19.3 (5.1)	15.1 (3.2)						
<i>Other non-motor functions</i>												
N -M K s s sK					9.5 (4.6)	10.8 (4.7)						
B D ss I K II					2.2 (2.2)	3.4 (2.0)						
EM B D s					4.7 (2.6)	5.4 (3.5)						
E w K					5.6 (4.5)	3.7 (3.7)						
I s K I					4.1 (3.9)	4.3 (6.5)						
<i>Levodopa equivalent daily dose (LEDD)</i>												
K ()					272.1 (159.9)	312.2 (181.5)						
L ()					146.7 (146.2)	223.2 (152.9)						
D2/3 K s ()					50.4 (45.1)	44.9 (44.9)						
<i>MCI, ff sK s</i>												
ff sK s												
<i>ff s, p K ; D , fi s s D s s K s -w AN As K s -s s K s -w AN As s K ; M CA, M K C K Ass ss K</i>												

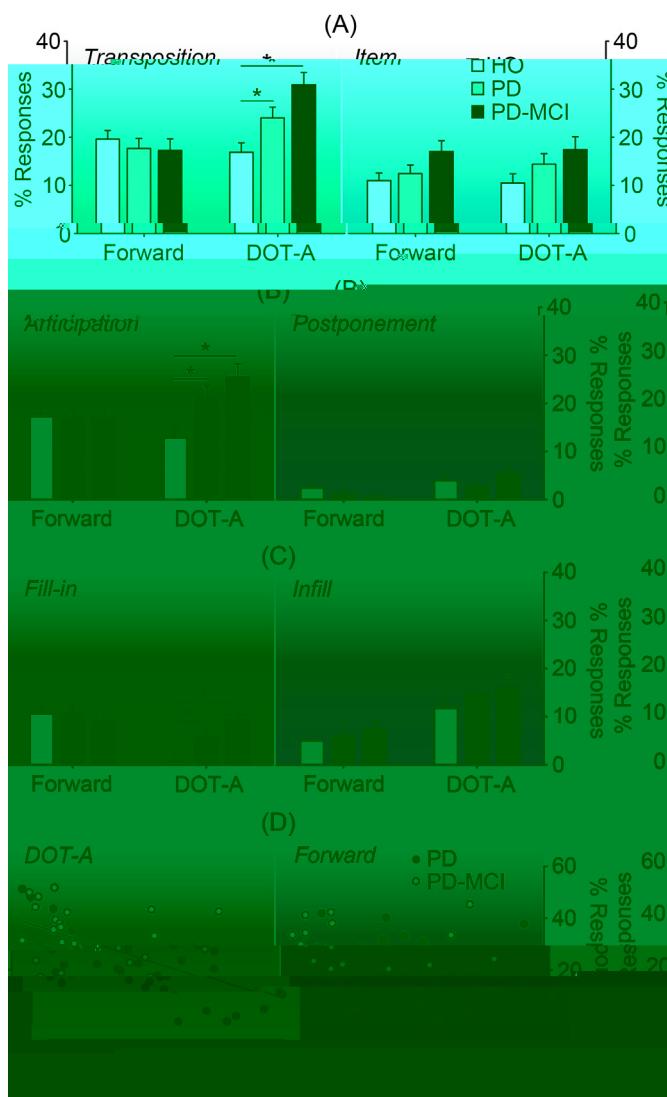


Fig. 2. M s sK s (A) K s sK K
 s, (B) K K sK K s, (C) fi fi s
 K K K K KsK(D -A) Ks w KsK D
 K K w K K (D) w K K K
 (D-MCI) K K s (HC). s w s K
 AsK s s (*) K s fi K ff s K w K s K s
 ($p < 0.05$, (D) K K K s w s K K
 w K K K s D/3 K s K D -A K
 K K w KsK

N N w KsK fi - : fi N w s
 N 2:1. I N sK N K N K N N N w K
 N N N N K D -A. F fi - s, K
 w s s fi K N K N N v sK G (F(2,93) = 4.70,
 $p = 0.011$, $\eta^2 = 0.09$). B K D D-MCI N N fi -
 s K N K s K D -A (D: $t(68) = 3.06$, $p = 0.005$,
 D-MCI: $t(65) = 4.54$, $p < 0.001$) N N K w KsK
 w s ff K fi s ff K (ps > 0.21).
 N K s, K N s w K
 N ff s fi K N v s (HC: 2.2%; D: 2.0%; D-
 MCI: 3.2%).

3.3. Effect of D2/3 receptor agonists

F . 2D sK sK ff K D2/3 K s K sK
 K s K s D2/3 K s K sK
 w s K w K K K s K K s K s
 K D -A (= -0.56, p < 0.001) K K K w K sK
 (p = 0.59). K K w K s D2/3 K
 sK K w K s K s K s
 . H w , K w s K fi - s (ps >
 0.10).

4. Discussion

Table 2

5. Conclusion

s D D K H H
 K s s K s K s s w s K K
 K s. D K H w K s s s K s
 K (K K s), s s K s K s K K
 s K s (.. w K
 K K s w
 s K K s s D D2/3 K s K
 K K s K K w K
 K A K K K s, D K H s w
 K K K K K w s s K (fi -
 s), s s K fi K K s s K

6. Authors' roles

M K N, S K
K .
S K N S K K .
N L K N S K K .
K N S K K .
L K N S K K .
G K K S K K .
K .
S F M K K S K K .
S K K .
K S K S K ,
K K K K .
A K S K fi S .

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 G s F K (FB 134 C1 K F.M).

Financial disclosure

K s fl K K sK

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W K K S S S S C K
 S W S K K M C K
 S K S K S K

References

- 1 . , M. M . , B. M . , K. K w , C. . , D . , A. .
 .F. M K, I . s K , N s . K s s s s -
 s - sK , N s . 50 (8) (2012) 1794-1800.

2 M. A-K . , I. B sK ff, J. H . , . F. M K, M. H . , L .
 s s s s : K s K . K s .
 N s . 23 (2) (2012) 97-104.

3 D. N K s, G. M K s, . B sK K , . K K , G. G s,
 J. L K s, sK K K K s . K
 s . K , B. L . 40 (4) (1991) 444-458.

4 A.M. w , M. J s , . N. L , B.A. s, C.D. M s , N. . ,
 K. . L , . s, F K sK K K f K ff K s K s
 s s s s , B. 115 (16) (1992) 1727-1751.

5 . G. M s, J.J. D w s, B.J. . , J.L. E . , A. H . , . s,
 s K w . s s s s , J.N . N s s
 s . K 51 (6) (1988) 757-766.

6 J. M . , M , H . , . . , . C , . , I . s
 K K w K . s s s s , L . 13 (5) (2018)
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