

정신분열병의 실험적 모델*

전진숙**†

Experimental Models of Schizophrenia*

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ABSTRACT

Animal models can provide a useful tool for the study of some aspects of psychiatric disorders and their treatment. The four criteria for the evaluation of animal models of psychiatric disorders are as following : 1) similarity of inducing conditions 2) similarity of behavioral state 3) common underlying neurobiological mechanisms 4) reversal by clinically effective treatment techniques. Several animal models have been proposed for schizophrenia : phenylethylamine model, L-dopa model, hallucinogen model, cocaine model, amphetamine model, phencyclidine model, noradrenergic reward system lesion model, reticular stimulation model, social isolation model, conditioned avoidance reaction, catalepsy test, paw test, self-stimulation paradigms, latent inhibition paradigms, blocking paradigms, prepulse inhibition of the startle reflex, rodent interaction, social behavior in monkeys, hippocampal damage, high ambient pressure, and models using selective breeding.

Among them, animals with bilateral lesion of the hippocampus may provide an adequate animal model for several symptoms of schizophrenia, and ketamine model can reproduce negative symptoms and cognitive deficits as well as positive symptoms of schizophrenia.

In conclusion, no model of schizophrenia is entirely representative of the disease, and findings gleaned from model systems must be cautiously interpreted. Furthermore, the process of developing and validating animal models must work in concert with the process to identify reliable measures of human phenomenology.

KEY WORDS : Schizophrenia · Latent inhibition paradigm · Hippocampal lesion model · Ketamine model · Models using selective breeding.

서론

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34

) (051) 250 - 5070,) (051) 241 - 5069

anthropomor -

phism (Martin Bateson 1993).

가

180

(Corbett

(re - 1993 ; Weiss Kilts 1995).

liability)

(validity)

(Geyer Markou 1995).

3. Self-stimulation

(Huston 1983). Sk -

inner box

. Ettenberg (1981)

(Schmajuk 1987).

(an -

imal assay model)

(homologous model)

4. Paw test

(Weiss Kilts 1995).

가

4cm

5cm

가 30cm, 30cm, 20cm pe -

가 가

rsplex box가

(conditioned avo -

(retraction time)

idance responding),

(catalepsy test),

(paw

test), 가

(self - stimulation paradigm)

ols 1988).

(latent inhibition paradigm),

(blocking paradigm),

(startle reflex)

상 동 모 형

(prepulse inhibition),

(social isolation model),

1. Primate social behavior

amphetamine , L - dopa , phenylethylamine(PEA)

1) Social withdrawal

d - amphetamine(0.5mg/kg) cocaine(10mg/kg)

, , phencyclidine(PCP)

, norepinephrine(NE)

(reward sys -

tem lesion model),

(reticular stimulation mo -

del)

(hyperarousal theory),

(high am -

bient pressure)

(Miczek Yos -

himura 1982).

(solitary)

(self - directed beh -

avior) : , (locomotion),

(stationary posture),

(self - grooming),

(partner - directed behavior) : (gr -

asping),

(displaying),

(genital display), hu -

ddling

Annett (1989) amphetamine

nucleus acc -

umbens

30

20cm

20cm

가

(social encounter)

동물분석모형

1. Apomorphine-induced climbing mouse assay

1kg 1.5mg apomorphine

10 ,

20 , 30

가 .

가 . , 가

0

, 가

1 , 가

2

(Corbett

1993).

2. Catalepsy test

60

. 1

2) Social isolation model

huddle, rock, self-clasp
(self-aggression)
(Kornetsky Markowitz 1978 ; McKinney Moran 1981).

3) Social interaction test

(social interaction, SI) rear walk
가 , SI time (Corbett 1993).

2. Latent inhibition paradigm

(latent inhibition, LI) tone
(preexposure) (Lubow 1973).
(Solomon 1981 ; Crider 1982).
LI (Weiner Feldon 1987 ; Christison 1988 ; Dunn 1993),
3 , 1 (preexposure) tone
, 2 (acquisition) (conditioning) shock , 3
(test) LI tone 가
LI amphetamine
LI (Feldon Weiner 1991). Weiner (1984)
1kg 1.5mg damphetamine

3. Kamin blocking paradigm

(blocking)

(selective attention)

, DA 가
(associative learning)
(LI) Kamin (KB)가 . LI (CS) , KB (UCS)
(CS₁) (UCS) CS
. LI CS UCS 20 60
KB CS₁ UCS CS₁
CS₂ UCS
1 CS₁ UCS, 2 (CS₁+CS₂) UCS, 3 CS₂
UCS

4. Sensorimotor gating model

가 (cognitive fragmentation) (Braff Geyer 1990).
(sensorimotor gating) - (prepulse inhibition, PPI) - , apomorphine (Geyer Braff 1987),
DA nucleus accumbens PPI가 (sensory flooding)
(cognitive fragmentation) (sensorimotor gating) (Braff 1992 ; Geyer 1993 ; Swerdlow 1994). apomorphine PPI (Swerdlow 1991 ; Swerdlow Geyer 1993).

5. High ambient pressure

helium-oxygen

가 (Abraini 1993). 20 bar

(locomotion), (myoclonia), (nucleus accumbens) (hoarding), (coprophagious behavior), (putamen) (Schickel 1987). (limb flicks), (consummatory grooming), (abortive grooming), (limb flick), (abortive grooming), (LSD-obs 1976).

6. Hippocampal damage model
 (locomotion), (myoclonia), (nucleus accumbens) (hoarding), (coprophagious behavior), (putamen) (Schickel 1987). (limb flicks), (consummatory grooming), (abortive grooming), (limb flick), (abortive grooming), (LSD-obs 1976).

2) Amphetamine model
 Ellinwood (1972) (amphetamines) (dyssynchrony) (sniffing), (forefinger probing), (pincer-like grasping), (picking) (Kornetsky Markowitz 1978).

Lipska (1992) (2, 4) (amphetamines) (DA) (ibotenic acid) (DA) (NE) (6-OHDA) (NE) (Stein Wise 1971).

7. Stein-Wise model
 6-hydroxydopamine (6-OHDA) (NE) (Stein Wise 1971).

8. Drug-induced psychosis
 (amphetamine, cannabis, cocaine, phencyclidine) (Bowers 1987 ; Kaplan Sadock 1998). (lysergic acid diethylamide (LSD)) (amphetamine cocaine) (PCP) (Snyder 1986 ; Barondes 1993).

1) LSD model
 d-lysergic acid diethylamide (LSD)

4) Cocaine model
 Cocaine dopamine transporter (DAT)

haloperidol
haloperidol(1 mg/kg)

요 약

가

4가

L - dopa , phenyleth -
ylamine , hallucinogen , amphetamine , phen -
cyclidine(PCP) , NE
, catalepsy , paw
paradigm, latent inhibition paradigm, blocking pa -
radigm, prepulse inhibition,
breeding
gating
face val -
idity, predictive validity, construct validity가 가

PCP ketamine PCP

가

NE

가

가

가

ketamine

중심 단어 :

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