

식사 행동의 신경학 : 섭취에 중점을 맞추어서

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Neuroscience of Eating Behavior : Focusing on Intake

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ABSTRACT

In modern society, nutritional and appetite disorders occur in epidemic proportions and are serious health hazards. Obesity and diabetes affect over 30% of American population, while eating disorders, such as anorexia nervosa and bulimia nervosa occur in a growing number of adolescences and young adults. The changes in various sociocultural aspects with the introduction of Westernized culture have had the effect of increasing the risk of same problems in Korea. Disorderd eating patterns are a primary symptom of numerous psychiatric disorders and loss of appetite and cachexia, during illness or in the elderly, preclude proper medical treatment for restoring good health or preserving life. Increased understanding of the systems of the body and brain, related to energy and nutrient balance, may help us to treatment and ultimately prevent these commom disorders.

In this review, the author highlights the psychobiological mechanisms or factors which are associated with eating behavior, especially in the view of intake psychobiology. This review would be concentrated on 1) the theoretical concepts and theories of eating behavior ; 2) the psychobiological determinants of food intake ; and 3) the psychobiological control of eating behavior.

KEY WORDS : Psychobiology · Eating behavior · Food intake.

서 론

(Blundell Hill 1986).

(1998).

가

가 (Blundell Hill 1993).

가

(eating behavior)

가

(Blundell 1995).

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가

3) (negative feedback)

가

4) ()

가

5) (Mook 1988). 가

가 가

6) 가

가 가 (lipostatic theory), (glucostatic theory), (aminostatic theory), (thermostatic theory) (energostatic theory) (Booth Weststrate 1994a ; Friedman Stricker 1976). 가 (multiaxial) (detector)가 (effector) 가

가

1950

3. 식사 행동의 항상성 가설(Homeostatic theory of eating behavior)

가

(homeostatic feedback) 가 (Booth Weststrate 1994a).

가

(auto -

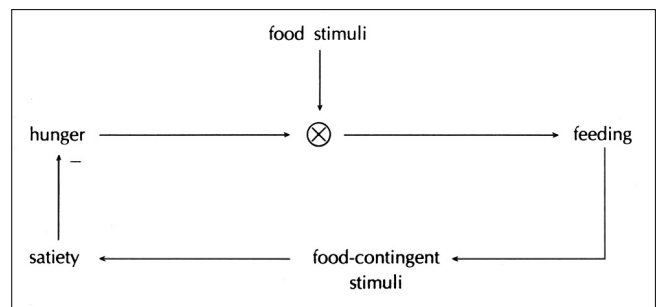


Fig. 1. Simple model of eating control based on physiological feedback. Cited from Mook DG(1988) : On the organization of satiety. Appetite 11 : 27-39

(Booth Weststrate 1994a).

4. 마시기(drinking)의 항상성 가설

(water specific appetite)

가

(Strubbe Mein 1977).

(circadian rhythm)

(satiety signal)

(reserved tissue)

1994).

(Strubbe

섭취(intake)와 연관이 있는 정신 생물학적 요인들

(Booth We -

ststrate 1994a).

가

5. 식사 행동과 마시기의 비항상성 가설

가

가

(hedonic)

(Booth We -

가

ststrate 1994a).

(Booth We -

ststrate 1994a).

(Cabanac 1971)

(Kissileff Van Itallie 1982).

1. 생리적 현상에 섭취가 미치는 영향

6. 장기 조절과 단기 조절

가

가

(Strubbe

1) 두부 반응(cephalic response)

1994).

set point

(Keeseey

1976)

가

가

가

가

가

가

가

가

(Woods 1986),

(ventromedial hypothalamus)

5

가

10

0 5%가

8

가

(Booth Weststrate 1994b).

1980

가 (hedonic va-

가

lue)

(Bruce 1987).

(Bessard 1983 ; Cunningham 1981 ; Shetty 1981)

가

가

5가 가가

(Booth Weststrate 1994b). , 1)

가

가 (Gumbiner 1991 ; Verga 1990).

; 2)

(Leblanc Brondel 1985 ;

가

;

Weststrate 1989), (Westerterp - Plantenga

1990)

3)

2. 음식 섭취가 기분과 행동에 미치는 영향

가

가

. Wurtman Wurtman(1986)

가가

(Booth Weststrate

1994b) ; 4)

가

가

가

가

가가

가

가 가 가 가 (Wurtman
Wurtman 1986). 가

(Leathwood Ashley 1984),

(craving) 가

(Booth 1987a, b), 가

. Drewnowski(1989)

opiate

가

2) 음식의 열 효과(thermal effect)

(energy expenditure)가 가

가

가

3. 생리적 현상이 섭취에 미치는 영향

가 가

(food craving),

(body wi-
sdom), (sociobiology)

(Booth Weststrate 1994b).

10%

가

(diet - induced the -

rmogenesis)

1) 음식에 대한 갈망

1

4

5) 맛있는(palatable) 음식의 섭취가 이후 음식 섭취에 미치는 영향

Hill (1984)

가

가

가

가

(Booth

Weststrate 1994b).

(Booth 1985).

식사 행동의 정신 생물학 (Psychobiology of Eating Behavior)

1. 식사와 체중 조절에 있어 말초 생리적 결정 인자

(2)

가

가

1, 5, 7, 9 10

(fr -

ontal brain)

opioid 가

가

(Leibowitz 1991b).

1) 식사의 시작

(Campfield Smith 1990).

12%

5

가

가

가

(Smith Gibbs 1995).

가 가

Smith

Gibbs(1995)

2) 식사의 유지와 종료

가

가

가

(pos -

itive feedback process)

(negative fee -

edback process) 가

(Smith 1990, 2).

(1)

(central control system)

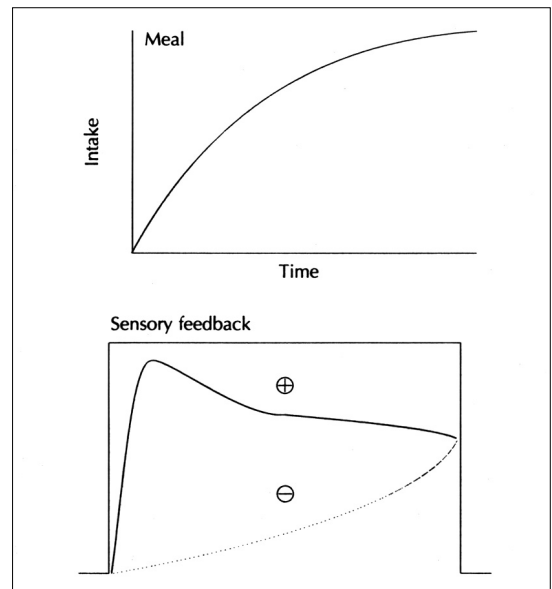


Fig. 2. Upper panel shows the cumulative intake curve of a representative meal. Lower panel shows the initiation, maintenance, and termination of eating (solid line, square wave) and the underlying positive (+, solid line) and negative (-, dotted line) feedback processes that determine the maintenance and termination of eating. Cited from Smith GP, Greenberg D, Cooper E, Gibbs J(1990) : Afferent information in the control of eating. In : Obesity : Toward a molecular approach, Ed by Bray GA, Ricquier D, Spiegelman BM, New York, Wiley-Liss, pp 63-79

(Smith 1990).

(3)

(Smith Gibbs 1995).

가

가

(Smith 1990).

(Smith Gibbs 1995).

가

(central action)

(Woods

1986).

가

가

2. 식사와 체중 조절에 있어 중추 생리적 결정 인자

(Kraly Gibbs 1980).

가

gastrin - releasing peptide가

1) ,

(Kraly 1978)가

; 2)

; 3)

4)

(signal)

cholecysto -

kinin

glucagon

(Gibbs Smith 1992).

cholecystokinin

가

(Smith

(Leibowitz 1995).

Gibbs 1995).

가

1) 말초의 신호 통합계

가

가

(Woods 1986)

mineralocorticoid

glucocorticoid

가

가

(Smith

glucocorticoid

Gibbs 1995).

가

가 가

(Blundell 1995).

. Estrogen

3) 음식량의 변화

가

(Leibowitz

1995).

가

2) 뇌에서의 신호 통합계

가 (2) ga -
 1) : latin, opioid peptide mineralocorticoid (Leibo -
 (dorsal vagus complex)가 witz 1991b, c).
 ;2) - : 가 (Leibowitz 1995).
 ;3) :

가 , 가
 ;4) (nucleus accumbens, 가 corticosterone min -
) : dopamine dopamine amphetamine phenyl -
 propanolamine eralocorticosteroid
 (Leibowitz 1995). (Leibowitz 1991b, 1992, 1995).

3) 영양소의 균형 조절에 있어 중추신경계의 역할

(1) 가 . Opioid peptide가
 가 (growth hormone - relea -
 sing factor)
 gamma - aminobutylic acid(GABA) norepinephrine, ne -
 uropeptide Y glucocorticoid .
 (paraventricular nu -
 cleus) . glucocorticoid
 가 (appetite)
 (Leibowitz 1988 ; Leibowitz 1991a, b).
 neuropeptide Y가
 가 가 가 가
 corticosterone 가 가 가 가
 가 가 가 가
 corticosterone 가 가 가
 가 galatin opioid 가
 cholecystokinin 가 estrogen
 (Leibow - (Leibowitz 1991b, 1992,
 itz 1995). 1995).

3. 식사와 체중 조절의 정신 생물학적 접근

(system) cascade
 가 (3)(Blundell 1988).
 Blundell(1995) (satiety) (satiety)
 가 가
 (psychobiological system)
 (Blundell 1995).
 가

1) 정신생물학적 체계를 움직이는 원칙 : 조절과 적응
 Blundell(1995)

가 cascade
 (appetite)
 Cholecystokinin
 가
 (Blundell 1995).

3) 정신 생물학적 체계의 조절

가 (network)
 (Blundell Hill 1993). , 1)
 가
 (motivation), (cognition)
 (passive overconsumption)
 (Bouchard 1985).
 가

2) 정신 생물학적 체계의 작동 : 포만 개스케이드(satiety cascade)

(satiety signal)
 (Blundell 1995).

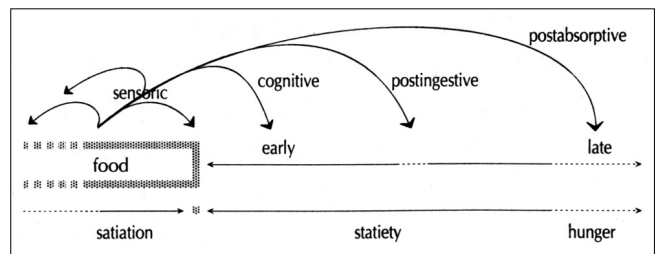


Fig. 3. Outline of the sequence of activation of satiety signals during and after a meal. Cited from Blundell JE, Hill AJ, Rogers PJ (1988) : Hunger and the satiety cascade-their importance for food acceptance in the late 20th century. In : Food Acceptability, Ed by Thompson DMH, London, Elsevier, pp 233-250

가 , cholecystokinin

processing)

3)

ronous)

결론

가

가

1) ; 2)

; 3) ; 4)

; 4) ; 5)

중심 단어 :

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