



# 본 론

## 1. 불안과 관련된 해부학적 구조물과 신경회로

가 Charney Deutch(1996) (amygdala) (orbitofrontal cortex) (inhibitory connection) (Davidson Irwan 1999). (anterior thalamus) (primary sensory cortex) (secondary sensory cortex) (classical conditioning) (extinction) (Gewirtz 1997). PET (amygdala), (hippocampus), entorhinal cortex, (prefrontal cortex) (positron emission tomography) 가 (Pizzagalli 2001). Morgan(1993) (medial prefrontal cortex) 가 (orbitofrontal cortex) (anterior cingulate) (Damasio 1994).

### 1) 전전두엽 피질(Prefrontal cortex)

(Tasman 1997). Luria(1973)

3

(Morgan LeDoux 1995).

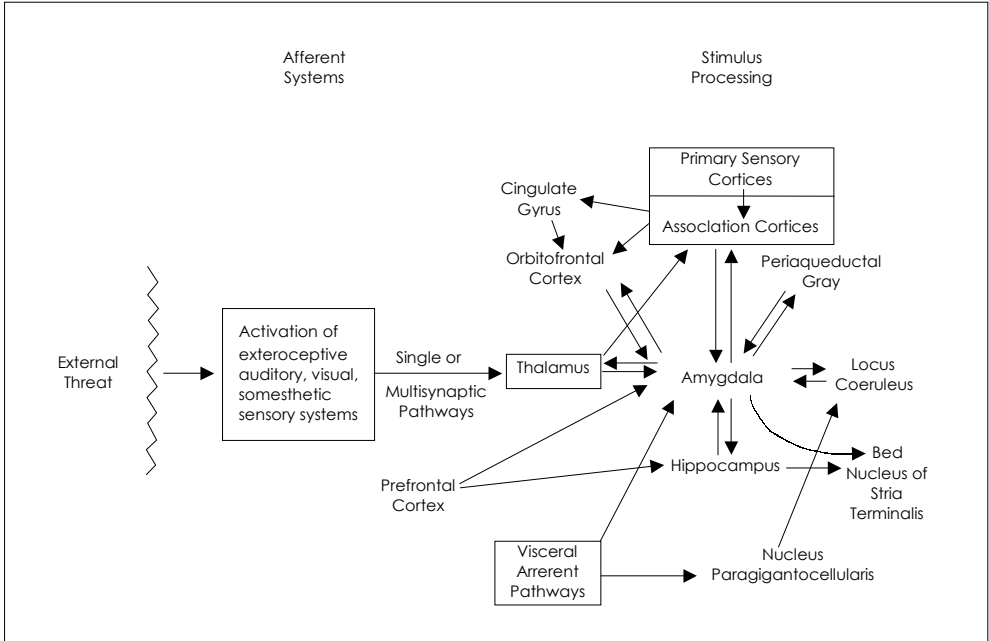


Fig. 1. Neural circuits of anxiety. Modification of a figure published in Charney and Deutch(1996).

2) 해마(Hippocampus) (Charney Deutch 1996).  
 (hippocampus) (Pet-rides 1985) (entorhinal cortex) (Squire Zola - Morgan 1991).  
 가 (Phillips LeDoux 1992).  
 가 (Sapolsky 1990) (Luine 1994).  
 가 (dendritic branching) (McEwen 1995).  
 가 (Bremner 1995)

3) 감각 관련 영역(Sensory association area) (occipital lobe), (temporal lobe)  
 (afferent) (excitatory input) (Sharney 1999).

4) 편도체(Amygdala) (thalamus)  
 (lateral neucleus) (central neucleus) (LeDoux 1998).  
 (Davis 1992 ; LeDoux 1998).  
 가 (parabrachial nucleus)(Takeuchi 1982), (hypothalamus)  
 (lateral nucleus)(Price Amaral 1981), 가  
 (locus ceruleus), 가  
 (adrenocorticoid hormone) 가  
 (paraventricular nucleus)(Dunn Whitenener 1986)  
 (periaqueductal gray region) (postural freezing)

**Table 1.** Anatomical structures associated with central nucleus of the amygdala and role in anxiety and phobia

Anatomical target	Effect of amygdala stimulation	Behavioral test or sign of fear or anxiety
Lateral hypothalamus	Sympathetic activation	Tachycardia, galvanic skin response, paleness, pupil dilation, blood pressure elevation
Dorsal motor N. of vagus	Parasympathetic activation	Ulcers, urination, defecation, bradycardia
Nucleus ambiguus		
Parabrachial nucleus	Increased respiration	Panting, respiratory distress
Ventral tegmental area	Activation of dopamine	Behavioral and EEG arousal,
Locus coeruleus	norepinephrine	increased vigilance
Dorsal lateral tegmental N.	acetylcholine	
N. reticularis pontis	Increased reflexes	Increased startle
Caudalis		
Central gray	Cessation of behavior	Freezing, conflict test, CER, social interaction
Trigeminal, facial motor N.	Mouth open, jaw movements	Facial Expression of fear
Paraventricular N.	ACTH release	Corticosteroid release ("Stress response")

(De Oca 1998)( 1 ). (Zemishlany 1990). GABA

가 HPS (Sullivan 1998). HPS

가 (cingulate gy- (Zamir 1986). (corticotropin

rus), (De Olmos 1990). (Zamir 1986). (corticotropin

가 (Gorman 2000). releasing factor, CRF) . CRF

(dorsolateral prefrontal cortex) (parietal) HPS - - (Hy- HPA )

(Sharney 1999). 2) 노르아드레날린(Noradrenalin) (yohimbin)

(declarative) (working memory) 1998). (locus ceruleus) 2- (Sullivan

가 (Charney 1984).

2. 불안과 관련된 신경내분비계의 물질 (Southwick

1) 시상하부 - 뇌하수체 - 소마토트로핀 축 1993). 가

(Hypothalamic-pituitary-somatotropin axis 이하 HPS축) MHPG(3 - methoxy 4 - hydroxypheny-

2 - ( 2 - adren- lglycol) (Sullivan 1998). ,

ergic antagonist) (clonidine) MHPG (positive correlation)

(Charney Heninger 1986) HPS (sodium lactate),

(Charney 1982) (generalized an- MHPG 가

xiety disorder)(Abelson 1981), (social ph- (Rifkin 1981)

obia)(Trancer 1993) 가 (Charney Heni-

SSRI nger 1985) MHPG

(fluoxetine) (Sullivan 1998). 가

4 가 가

(Brambilla 1995). SSRI (Garfield 1967), Sullivan (1998)

(state - trait) 가

(Aulakh 1994). 3) 불안과 공황 장애의 기능적 - 해부학적 연관성

가 - . De- 가 (octapeptide, CCK - 8) , 4가  
 akin Graeff(1991) ( CCK가 가 (Brad-  
 ) (dorsal raphe nucleus) wejn 1991).  
 . HPA CCK - 8 가 (Lyd-  
 (amygdalofugal) iard 1992) CCK -  
 . 가 , , CCK - 4 가  
 (dorsal periaquiductal gray, PGA) CCK - 4가 CCK - B  
 / 가 가 CCK - 8 CCK - A CCK - B  
 PGA , (Bredwejn 1993).  
 가 (Last CCK  
 Hersen 1988). 가  
 가 . 가가 (Bradwejn 1991).  
 HPA , HPA  
 (Coplan 1996). “ HPA - 가  
 ” HPA  
 , PGA  
 ” PGA  
 .

4) HPA 축과 시상하부 외의 CRF  
 CRF

(Nem-  
 eroff 1992). CRF  
 (corticolimbic), 가  
 (brain stem) . CRF  
 (forebrain)  
 (bed nucleus) (stria terminale)  
 (Coryell 1989). CRF 가  
 가 ,  
 . CRF  
 (viscerosensory) 가  
 ,  
 ,  
 ,  
 (LeDoux 1998 ; Burtler 1990).

5) 콜레시스토키닌(Cholecystokinin, 이하CCK)  
 CCK

. CCK 가 8

3. 불안 장애의 신경영상학적 연구

1) 구조적 MRI 연구

가  
 (Bremner 1995).  
 (Bremner 1993). EEG  
 (temporal lobe)  
 (Locatelli 1993). Jenike (1996)

2) 기능적 MRI 연구

가  
 (Bibaumer 1998)  
 가  
 (Krystal 2001).  
 MRI  
 (Whalen 1998).  
 (medial orbitofrontal cortex),  
 (lateral frontal), , (caudate),  
 (lenticulate), (Breiter 1996).

3) MR 분광영상검사법(Spectroscopy)

<sup>1</sup>H - MR spectroscopy

(Dager 1999 ; Dager 1995).

GABA

( (cholin) - (myo - ino- sitol) ) (Tupler 1997).

4) PET(Positron emission tomography)

PET

(parahippocampal) 가

가 , PET - FDG (auditory discrimination task) , (left inferior parietal) (cingulate gyrus) (Reiman 1997).

(Bremner 1997).

가 (limbic area)

(paralimbic area)

가 가

(Rauch 1996). (anterior cingulate cortex) (specific phobia) 가

MRI

(caudate nucleus),

가 가

(basal ganglia) 가

(Rauch 1994).

(neuroreceptor)

(insula)

1998).

GABA 가

(Malizia

(Krystal 2001).

면 면

가

중심 단어 :

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