

# A Short Reveiw on the Acupoints Used in the Studies about Morphine Addiction

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## 모르핀 중독의 침 연구에 사용된 經穴에 대한 小考

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### Abstract

**Objectives :** Since acupuncture was accepted as an useful therapy for the drug addiction, a lot of studies about acupuncture have been carried out. This study was performed to review the articles about morphine addiction which used acupuncture as a treatment and to interpret the use of acupoints from the viewpoint of Six-meridian (Yuk Gyeong, three yin and three yang) theory.

**Methods :** The authors searched 255 articles in PubMed with the key word of “morphine, acupuncture” and 629 articles in KISS (Koreanstudies Information Service System) with the key word of “morphine”. The articles written in English only were included. The articles related with morphine (abuse, dependence, sensitization, addiction, intake, withdrawal sign, withdrawal syndrome, reinstatement, craving) only were included. The articles which used manual- or electro-acupuncture only were included and auricular acupuncture was excluded. Both of clinical and experimental study were reiewed.

**Results :** The most frequently used acupoint was ST36-SP6 (electroacupuncture), and the second was HT7. LI4 was the third, and BL23 and PC6 were also used.

**Conclusions :** The acupoints used in the morphine study seem to influence the brain through diverse mechanisms and it is thought that control of the reaction against stress appears to be related with these mechanisms.

**Key words :** morphine, abuse, addiction, acupuncture, acupoint, meridian

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## I . Introduction

Morphine is a representative analgesics used widely for pain control. However, it belongs to the drugs of abuse owing to the high potential for addiction. Administration of morphine promotes

the extracellular dopamine (DA) release in the nucleus accumbens (NAc) of mesolimbic system of brain through dampening of the gamma-aminobutyric acid (GABA) interneuron in the ventral tegmental area (VTA) caused by activation of mu-opioid receptors<sup>1)</sup>. This activation is linked to the positive reinforcement driving subjects to the drug seeking and repeated use of morphine could induce diverse neuronal changes associated with dependence<sup>2-4)</sup>.

In addition to the possibility of dependence and abuse, some side effects<sup>5)</sup> make morphine be substituted or co-work with other treatment.

Acupuncture, a representative therapy used for a long time in the eastern Asia, has been gaining an outstanding interest as a novel therapy in the field of drug addiction<sup>6,7)</sup>. In this atmosphere, many studies have demonstrated that acupuncture could be effective for morphine addiction. However, such studies have mentioned the effectiveness through neuronal or molecular mechanism only and there is no article that took a sight of the effectiveness of acupoints on the viewpoint of meridian theory (three yin and three yang theory), one of the most important theory in the acupuncture of oriental medicine.

Here, we reviewed morphine studies that had used acupuncture and interpreted the effectiveness of acupoints on the viewpoint of meridian theory.

## II. Materials and Methods

### 1. Materials

1) The authors searched 255 articles in PubMed (US National Library of Medicine National Institutes of Health, <http://www.ncbi.nlm.nih.gov/sites/>

entrez?db=pubmed) using keywords of 'morphine, acupuncture', and 629 articles in KISS (Korean-studies Information Service System, <http://search.koreanstudies.net/>) using 'morphine'.

2) Articles written in English only were subjected.

3) Articles not focused to the addiction including abuse, dependence, sensitization, intake, withdrawal sign, withdrawal syndrome, reinstatement, seeking were excluded.

4) Articles using body acupuncture (manual or electrical) only were treated and auricular acupunctures were excluded.

5) Both of experimental and clinical research were reviewed.

## 2. Methods

1) From the 844 articles searched in the PubMed and KISS, the 17 articles were chosen finally according to the selection guideline described above.

2) We searched the acupoints used in the subjects and investigated the reason why the points were used for the morphine addiction on the viewpoint of meridian and collateral theory.

## III. Results

### 1. Analysis of acupoints used in the morphine study

The acupoints used in the morphine researches are as follow (Table 1).

**Table 1. Acupoints Used for Morphine Addiction**

Model(disease)	Effect	Used-acupoint	Country of corresponding author
Self-administration	Suppression of self-administration	HT7	Korea <sup>8)</sup> Korea <sup>9)</sup>
Withdrawal	Suppression of withdrawal sign (jumping)	LI4	Canada <sup>10)</sup>
	Increase of preprodynorphin mRNA level in spinal cord, PAG, hypothalamus	ST36-SP6	China <sup>11)</sup>
	Suppression of p-CREB in spinal cord, PAG, hypothalamus		
	Suppression of withdrawal signs (weight loss, salivation, diarrhea, abnormal behavior)	BL23	China <sup>12)</sup>
	Suppression of c-Fos expression in the central nucleus of amygdala		
	Increase of corticosterone response		
	Suppression of withdrawal signs (wet dog shakes, writhing, teeth chattering, diarrhea)	HT7	Korea <sup>13)</sup>
	Suppression of withdrawal signs (wet dog shakes, escape attempts, teeth chattering, writhing, ejaculation, rearing, screech, body weight loss)	ST36-SP6	China <sup>14)</sup>
	Increase of spinal dynorphin release		
	Suppression of withdrawal signs (wet shakes, escape attempts, teeth chattering, weight loss, penile licking)		China <sup>15)</sup>
CPP	Facilitation of recovery of male sexual behavior		China <sup>16)</sup>
	Increase of TST concentrations		
	Increase of enkephalin in the NAc	ST36-SP6	China <sup>17)</sup>
	Increase of mRNA level of preproenkephalin in the NAc		
	Suppression of CPP via opioid receptors		China <sup>18)</sup>
	Increase of the size of DA neurons in the VTA		China <sup>19)</sup>
	Increase of the sensitivity of DA neurons to the morphine		
Activity	Suppression of CPP		China <sup>20)</sup>
	Improvement of spatial memory ability		
	Suppression of locomotor activity	HT7	Korea <sup>21)</sup>
	Attenuation of Fos-like immunoreactivity cells in the NAc shell and striatum		
	Suppression of hyperactivity (stereotype and non-streotype)		Korea <sup>22)</sup>
	Suppression of DA release in the NAc		

## 2. Frequency of use of acupoints

In the morphine studies, ST36-SP6 (Electro-acupuncture) had been used the most frequently

(10 times) and HT7 was the next (5 times). LI4 appeared 2 times, and the acupoints that had been used once only were BL23 and PC6 (Fig. 1).

**Table 1. Continued**

Model (disease)	Effect	Used-acupoint	Country of corresponding author
Morphological change in the VTA	Inhibition of fragmentation, degranulation and vacuolar change of the RER Improvement of damages to the mitochondrial membranes and cristae Inhibition of apparent indentations in the nuclei Tightening of the empty cavity and lamellar separation in the myelin sheath	ST36-SP6	China <sup>23)</sup>
Side effect	Increase of NK cell activity reduced by morphine in the postoperative patient	ST36, SP6, LI4, PC6	China <sup>24)</sup>

### 3. Theme of studies

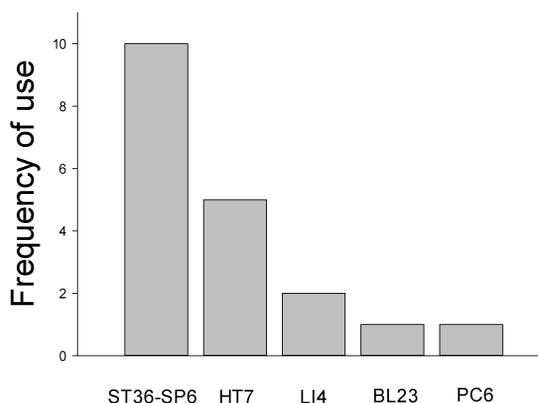
Almost of morphine studies using acupuncture belong to behavior study and evaluating of the effect of acupuncture on the withdrawal signs appeared the most frequently.

## IV. Discussion

### 1. Review on the acupoints used for morphine study

#### 1) ST36-SP6

Acupoint used most frequently in morphine study was ST36-SP6. These points were used together because the researchers performed electroacupuncture. ST36 is the Accumulation point of Stomach Meridian<sup>25)</sup>, so it seems that ST36 might reveal its function on morphine through regulation of Pericardium Meridian related with stress reaction by controlling of Stomach Meridian linked to Pericardium Meridian with the special connection between viscera and bowel called Jang Bu Sang Tong<sup>26)</sup>.



**Fig. 1. Frequency of the use of acupoints.**

According to some previous studies, ST36 regulates electrolyte metabolism<sup>27)</sup> and blood stream of brain<sup>28)</sup>. Also, Kim et al.<sup>29)</sup> reported that ST36 could influence the vitality in the specific area of brain through fMRI study.

Therefore, ST36 appears to affect the brain by regulating the unbalance of electrolyte metabolism in the morphine addiction.

SP6 belongs to Spleen Meridian and the crossing point of Spleen, Liver and Kidney Meridians. It tonifies and holds in the blood, calms the mind.

moves the blood, stops pain and regulates the circulatory system<sup>30)</sup>. As well, SP6 controls the blood aspect as one of the Eum Yang Yi Chong Hyul. Oriental medicine says that regulation of blood aspect could influence the spiritual function, and Hong et al's fMRI study<sup>31)</sup> demonstrated that electroacupuncture at SP6 regulates the vitality of the specific region of brain. So, based on these results it seems to be reasonable that SP6 was used in morphine studies.

In addition, according to other study<sup>32)</sup>, food consumption is related with the release of endorphine and dopamine in the nucleus accumbens of brain as if drugs of abuse are. Also, addiction of sugar and drug have similar neuronal pathway. Therefore, acupuncture at ST36-SP6 might influence the reward system in the brain through regulating Stomach Meridian and Spleen Meridian commonly associated with desire for food.

As well, a number of studies<sup>33-36)</sup> demonstrating that electroacupuncture at ST36-SP6 could affect the stress reaction suggest the possibility to regulate the stress accompanied in the morphine addiction. Indeed, SP6 was mainly used for the attenuation of withdrawal signs and it appears to be based on such a mechanism.

## 2) HT7

HT7 is the Source point, Earth point and Sedation point of Heart Meridian. It is the most widely used acupoint for disturbance of the spirit and specific acupoint for the emotional problem related with heart function<sup>30)</sup>. In oriental medicine, the heart handles spiritual function as monarch and the function of brain also belongs to heart. It is parallel with the facts that acupuncture treatment such as Tae Geuk Chim uses Heart Meri-

dian for the diagnosis and treatment and that Eight Constitutional Acupuncture Treatment uses many acupoints of Heart Meridian for the treatment of mental diseases. As well, according to the meaning of the name of acupoints, HT7, the Source point of Heart Meridian, is one of the main acupoints to handle the mental function. So, it might be reasonable that HT7 was used for the abused drugs like morphine, and the reason why HT7 had been shown to regulate the eating disorders induced by the stress<sup>37)</sup> through the control of neuropeptide Y and opioid system seems to be also related with this effect HT7 on mental function.

## 3) LI4

LI4 is the Source point of Large Intestine Meridian and it clears heat, relaxes muscular tension, relieves pain, calms the mind and interior wind and tonifies blood<sup>30)</sup>. The reason why LI4 was used for morphine seems that LI4 could regulate the stress reaction through the control of reverting yin as the Source point of yang brightness linked to reverting yin, like ST36 does. Also, some previous studies' demonstrations<sup>38,39)</sup> that acupuncture at LI4 could regulate the blood stream of brain appear to account for the mechanism that LI4 might control lesser yin using control of yang brightness<sup>26)</sup> and therefore, regulate the blood circulation<sup>40)</sup>.

In addition, the use of LI4 for the acupuncture anesthesia<sup>25)</sup> is also thought to be based on such a fact that LI4 could influence the brain.

## 4) BL23

BL23 can stabilize a fluctuating Yin-Yang balance and is usually used for disharmonies of

will, fear, depression, emotional lability and problems of ageing<sup>30)</sup>. According to the meridian theory of oriental medicine, Bladder Meridian is connected with brain itself and linked with the Governor Vessel which is related with brain. So, Liu et al.<sup>12)</sup> seems that used this point for morphine withdrawal syndrome.

## 5) PC6

PC6 is the Connecting point of Pericardium Meridian and Opening point of Yin Link Meridian. It moves stagnation of blood and calms irregularity of Qi as well as spirit. Also, PC6 is used for the control of pain, shock, and disturbance of spirit<sup>30)</sup>. In addition, this is a representative acupoint used for the control of stress reaction<sup>25)</sup>. Therefore, it seems that PC6 exerts its function by regulating the stress accompanied in morphine addiction.

## 2. Tendency of selecting acupoints and specificity according to country

On the other hand, there could be found one interesting thing that ST36-SP6 was used by Chinese researchers only, while Korean researchers used HT7. Also, another interesting is that Chinese researchers used electroacupuncture, while Korean used manual acupuncture.

## V. Conclusions

As a summary, acupoints used in the morphine studies seem to regulate brain function through diverse course and the control of stress reaction is thought to have important relation. Also, it is likely that there are some specificities following

country.

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## References

1. Johnson SW, North RA. Opioids excite dopamine neurons by hyperpolarization of local interneurons. *J Neurosci.* 1992 ; 12(2) : 483-8.
2. Vanderschuren LJ, De Vries TJ, Wardeh G, Hogenboom FA, Schoffelmeer AN. A single exposure to morphine induces long-lasting behavioural and neurochemical sensitization in rats. *Eur J Neurosci.* 2001 ; 14(9) : 1533-8.
3. Wise RA, Bozarth MA. Action of drugs of abuse on brain reward systems: an update with specific attention to opiates. *Pharmacol Biochem Behav.* 1982 ; 17(2) : 239-43.
4. Everitt BJ, Dickinson A, Robbins TW. The neuropsychological basis of addictive behaviour. *Brain Res Brain Res Rev.* 2001 ; 36(2-3) : 129-38.
5. Jiang YH, Jiang W, Jiang LM, Lin GX, Yang H, Tan Y, et al. Clinical efficacy of acupuncture on the morphine-related side effects in patients undergoing spinal-epidural anesthesia and analgesia. *Chin J Integr Med.* 2010 ; 16(1) : 71-4.
6. Bullock ML, Umen AJ, Culliton PD, Olander RT. Acupuncture treatment of alcoholic recidivism: a pilot study. *Alcohol Clin Exp Res.* 1987 ; 11(3) : 292-5.
7. Anonymous. NIH Consensus Conference.

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- Acupuncture. *JAMA*. 1998 ; 280(17) : 1518-24.
8. Lee BH, Park SY, Lee JH, Lim SC, Kim JS, Lee YK, et al. Duration pattern of the effect of acupuncture at HT7 in morphine self-administration. *J Korean Acupuncture and Moxibustion Society*. 2010 ; 27(4) : 55-65.
  9. Yoon SS, Kim H, Choi KH, Lee BH, Lee YK, Lim SC, et al. Acupuncture suppresses morphine self-administration through the GABA receptors. *Brain Res Bull*. 2010 ; 81(6) : 625-30.
  10. Cheng RS, Pomeranz B, Yu G. Electroacupuncture treatment of morphine-dependent mice reduces signs of withdrawal, without showing cross-tolerance. *Eur J Pharmacol*. 1980 ; 68(4) : 477-81.
  11. Wang GB, Wu LZ, Yu P, Li YJ, Ping XJ, Cui CL. Multiple 100 Hz electroacupuncture treatments produced cumulative effect on the suppression of morphine withdrawal syndrome: Central preprodynorphin mRNA and p-CREB implicated. *Peptides*. 2011 ; 32(4) : 713-21.
  12. Liu S, Zhou W, Liu H, Yang G, Zhao W. Electroacupuncture attenuates morphine withdrawal signs and c-Fos expression in the central nucleus of the amygdala in freely moving rats. *Brain Res*. 2005 ; 1044(2) : 155-63.
  13. Lee JH, Kim HY, Jang EY, Choi SH, Han CH, Lee BH, et al. Effect of acupuncture on naloxone-precipitated withdrawal syndrome in morphine-experienced rats: the mediation of GABA receptors. *Neurosci Lett*. 2011 ; 504(3) : 301-5.
  14. Wu LZ, Cui CL, Tian JB, Ji D, Han JS. Suppression of morphine withdrawal by electroacupuncture in rats: dynorphin and kappa-opioid receptor implicated. *Brain Res*. 1999 ; 851(1-2) : 290-6.
  15. Han JS, Zhang RL. Suppression of morphine abstinence syndrome by body electroacupuncture of different frequencies in rats. *Drug Alcohol Depend*. 1993 ; 31(2) : 169-75.
  16. Cui GH, Ren XW, Wu LZ, Han JS, Cui CL. Electroacupuncture facilitates recovery of male sexual behavior in morphine withdrawal rats. *Neurochem Res*. 2004 ; 29(2) : 397-401.
  17. Liang J, Ping XJ, Li YJ, Ma YY, Wu LZ, Han JS, et al. Morphine-induced conditioned place preference in rats is inhibited by electroacupuncture at 2 Hz: role of enkephalin in the nucleus accumbens. *Neuropharmacology*. 2010 ; 58(1) : 233-40.
  18. Wang B, Luo F, Xia YQ, Han JS. Peripheral electric stimulation inhibits morphine-induced place preference in rats. *Neuroreport*. 2000 ; 11(5) : 1017-20.
  19. Hu L, Chu NN, Sun LL, Zhang R, Han JS, Cui CL. Electroacupuncture treatment reverses morphine-induced physiological changes in dopaminergic neurons within the ventral tegmental area. *Addict Biol*. 2009 ; 14(4) : 431-7.
  20. Chen JH, Liang J, Wang GB, Han JS, Cui CL. Repeated 2 Hz peripheral electrical stimulations suppress morphine-induced CPP and improve spatial memory ability in rats. *Exp Neurol*. 2005 ; 194(2) : 550-6.
  21. Lee B, Shim I, Lee H, Yin CS, Park HK, Yang JS, et al. Morphine-induced locomotor response and Fos expression in rats are inhibited by acupuncture. *Neurol Res*. 2010 ; 32 (Suppl 1) : 107-10.
  22. Kim MR, Kim SJ, Lyu YS, Kim SH, Lee Y,

- Kim TH, et al. Effect of acupuncture on behavioral hyperactivity and dopamine release in the nucleus accumbens in rats sensitized to morphine. *Neurosci Lett.* 2005 ; 387(1) : 17-21.
23. Chu NN, Xia W, Yu P, Hu L, Zhang R, Cui CL. Chronic morphine-induced neuronal morphological changes in the ventral tegmental area in rats are reversed by electroacupuncture treatment. *Addict Biol.* 2008 ; 13(1) : 47-51.
24. Zhang Y, Du L, Wu G, Cao X. Electroacupuncture (EA) induced attenuation of immunosuppression appearing after epidural or intrathecal injection of morphine in patients and rats. *Acupunct Electrother Res.* 1996 ; 21(3-4) : 177-86.
25. The committee for publish of meridian and acupoint textbook. *Meridian and Acupoint of College (Ant.)* 5th ed. Wonju : Euibang Publishing Company. 2010 : 70, 256, 341, 345, 424, 581.
26. Lee BH, Kim SJ, Jung CH, Kwon SY, Lim SC, Lee KM, et al. A study on the basic principle of the classification of sidong disease, sosaeng disease. *J Korean Acupuncture and Moxibustion Society.* 2008 ; 25(5) : 43-57.
27. Kwak DU, Park KW, Yang CH. Effects of acupuncture at the Chok - Sammi (ST36) locus on plasma renin activity and plasma aldosterone, electrolyte levels in men. *J Korean Acupuncture and Moxibustion Society.* 1991 ; 8(1) : 367-88.
28. Cho NG. Effect of acupuncture treatment at S 36 on the blood pressure and cerebral hemodynamics of rats. *J Korean Acupuncture and Moxibustion Society.* 1999 ; 16(4) : 307-19.
29. Kim YI, Kim YH, Im YG, Lee H, Lee BL, Kim YJ. A fMRI study on the cerebral activity induced by electro-acupuncture on Zusanli(St36). *J Korean Acupuncture and Moxibustion Society.* 2003 ; 20(5) : 133-50.
30. Ross J. *Acupuncture point combinations: the key to clinical success.* Philadelphia : Churchill Livingstone. 1995 : 177-8, 190, 213-7, 231-3, 277-9, 306-8, 320-1.
31. Hong KE, Lee BR, Lee H, Yim YK, Kim YJ. fMRI study on the cerebral activity induced by electro-acupuncture on Sanyinjiao (Sp6). *J Korean Acupuncture and Moxibustion Society.* 2003 ; 20(3) : 86-103.
32. Fortuna JL. Sweet preference, sugar addiction and the familial history of alcohol dependence: shared neural pathways and genes. *J Psychoactive Drugs.* 2010 ; 42(2) : 147-51.
33. Jeong EW, Kim HS, Lee SK, Kim MS, Cho ZH, Sung KK. Effects of electroacupuncture on plasma stress hormone responses to acute and chronic immobilization stress. *J Korean Acupuncture and Moxibustion Society.* 2010 ; 27(5) : 105-15.
34. Lim SK, Lee DH, Kwon YJ, Lee JC, Jung CJ, Kim YS, et al. Effects of fixed-intensity and varied-intensity electroacupuncture on heart rate variability in healthy people with stress task. *J Korean Acupuncture and Moxibustion Society.* 2011 ; 28(2) : 107-16.
35. Jo MH, Choi BT, Jang KJ. The effects of 120 Hz high frequency electroacupuncture on the cold-restraint-induced gastric mucosal damages. *J Korean Acupuncture and Moxibustion Society.* 2003 ; 20(3) : 177-93.
36. Lee CH, Kim YH, Song BY, Yug TH. Expression of neurotransmitter (CRF, CRF-R

- and CRF-BP) related to stress in stomach and zusanli in rats. J Korean Acupuncture and Moxibustion Society. 2003 ; 20(6) : 89-102.
37. Park HJ, Lyu YH, Hong MS, Kim ST, Im SBN. The effect of HT7 acupuncturing on the food intake and hypothalamic neuropeptide Y expression changed by maternal separation in rat pups. J Korean Acupuncture and Moxibustion Society. 2003 ; 20(4) : 93-101.
38. Mun HC, Hwang WJ, Lee GM, Cho JW, Oh HH, Byun JY, et al. The nuclear medical study on the effect of LI4 acupuncture on cerebral blood flow. J Korean Acupuncture and Moxibustion Society. 2001 ; 18(4) : 46-54.
39. Lee GM, Hwang YJ, Yang YS, Kim SJ, Lyu DS, Kim MJ, et al. The nuclear medical study on the effect of Hap - Kok (LI4) Acupuncture on cerebral blood flow. J Korean Acupuncture and Moxibustion Society. 2001 ; 18(6) : 93-104.
40. Lee KW. Pyun Ju Yeok Hae Hwang Je Nae Kyeong (1). Seoul : Yeogang Publishing Company. 2000 : 236.

#### 국문초록

**목적 :** 침 치료는 약물 중독을 위한 효과적인 치료법으로 인정받은 이래 이에 관한 많은 연구들이 이루어지고 있다. 본 논문에서는 모르핀 중독의 침 치료에 사용된 경혈 및 소속 경락에 대해 六經적인 관점에서 이를 해석하였다.

**방법 :** 미국 국립 의학도서관(PubMed)에서 “모르핀, 침”을 주제로 하여 255개의 논문을 검색하였고, 한국 학술정보(주)(KISS)에서 “모르핀”을 주제로 하여 629개의 논문을 검색하였다. 영어로 기술된 논문만을 연구 대상으로 하였다. 모르핀에 대한 중독(남용, 의존, 민감화, 중독, 섭취, 금단 증상, 금단 증후군, 재발, 갈망)과 관련된 논문만을 연구 대상으로 하였다. 침 또는 전침을 사용한 논문만을 연구 대상으로 하였으며, 이침을 사용한 것은 제외하였다. 임상 연구와 실험 연구를 모두 연구 대상으로 하였다.

**결과 :** 모르핀의 침 연구에서 가장 많이 사용된 경혈은 足三里-三陰交(전침, 10회)로 나타났고, 그 다음은 神門(5회)이었으며, 그밖에 合谷(2회), 腎俞(1회), 內關(1회) 등의 경혈이 사용되었다. 足三里는 장부상통에 의해 심포경과 통하는 위경을 조절함으로써 스트레스 반응에 관계된 심포경을 조절할 수 있음에 따라 모르핀 중독 연구에 사용된 것으로 보인다. 음양이총혈의 하나인 三陰交는 정신 기능에 영향을 미치는 혈분을 다스리며 식욕을 조절하는 기능 또한 이러한 효능에 관련된 것으로 사료된다. 수소음심경의 원혈인 神門은 뇌와 관계된 소속 경맥의 기능 및 혈명으로부터 정신 기능을 조절할 수 있음을 알 수 있다. 陽谿는 양명경의 원혈로서 상통하는 췌음경을 조절함으로써 스트레스 반응을 조절할 수 있기 때문에 사용된 것으로 보이며, 腎俞는 소속 경맥이 뇌와 관련되어 있기 때문에 사용된 것으로 사료된다. 內關은 모르핀 중독에 수반되는 스트레스를 조절할 수 있기 때문에 사용된 것으로 보인다.

**결론 :** 모르핀 연구에 사용된 경혈은 다양한 기전을 통해 뇌 기능에 영향을 미치는 것으로 보이며, 스트레스 반응을 조절하는 것이 이에 관련된 것으로 사료된다.

**주제어 :** 모르핀, 남용, 중독, 침, 경혈, 경락