

정상 수면생리

양 창 국

Normal Sleep Physiology

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서 론

가 1/3

가

24

1929 Hans Berger

1)

가

수면의 정의

(electrooculography)

, Aserinsky Kleitman

(rapid eye movement sleep, REM)

가 (REM sleep)

(non-REM sleep)

2)

(perceptual disengagement)

가 3)

(種)

4)

(

) 가

2가

: , 602 - 715

37가-1

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가 . ,

(ultradian process)

(),

(,),

(,).

가 . 2

20

5)

7) 2~8

(multiple sleep

lat - ency test) (,)가

가 .

가 가 .

, 2가

가

(electro -

encephalography, EEG), (electrooculography,

EOG), (electromyography, EMG)

, 2가

가

(Fig. 1

() 3, 4).

가 . 6)

8

수면과 각성의 조절

가

3

가

6) 3

(1)

(homeostatic process), (2) 24

(ci -

rcadian process), (3) 2가

가

5)

24

8)

(retinohypothalamic

tract)

(suprachiasmatic nucleus, SCN)

가

SCN SCN

(efferent projections)

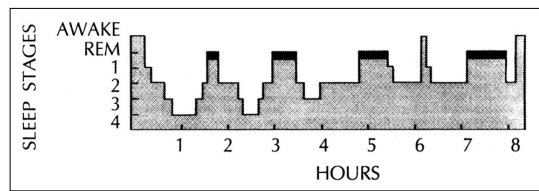


Fig. 1. This sleep histogram illustrates the typical night's sleep of a normal young adults (From Morin CM. Insomnia : Psychological assessment and management. New York : The Guilford Press : 1993).

Fig. 2

(3~5) 가 , (5~8)

가 , (1~3)

비렘-렘수면 주기

가 () . Fei-
 가 nberg)
 . 3, 4 가 nberg)
 . 70~100 가 .¹³⁾
 . 90~120 가 () .
 90~110 .³⁾ , , 가 .

수면 단계들의 분포

1/3 , , 가 .
 , 1/3 가 .
 (Fig. 1). , , (가),
 , 가 가 가 가 .¹⁴⁾

수면단계의 분포에 영향을 주는 요인

(circadian phase) .¹⁵⁾
 , , 가 .⁵⁾
 1 가 .
 50~60 90
 16~18 , 1
 14 , 3 12 (blood brain barrier)
 .¹⁴⁾
 1 50% , ,
 3 20% , , ,
 가 .¹¹⁾
 가 가
 25~30% 가 , , ,
 .¹²⁾ , .¹⁴⁾
 가

7% 정상 성인에서 수면에 대한 개괄

가	가	21)	가	3)
			1)	
		14)	2)	90
			3)	1/3
			4)	1/3
	가		5)	5%
	22)		6) 1	2~5%
정상 수면 요구량			7) 2	45~55%
			8) 3	3~8%
			9) 4	10~15%
			10)	75~80%
			11)	20~25%
			4~6	가

수면의 전기생리적인 기록

가	가	7.5	8.5
가	가	23)	“
”	(가	가
가	가	가	일반적인 고려
가	가	18)	가
가	가	가	가 (upward de-
가	가	가	가 (dow-
가	가	가	nward deflection)
5	(short sl-	()
eeper), 10	(long	.	;
sleeper)	24)	(8~13 cps),	(>13 cps),
	가	(4~7 cps).	(<4 cps),
		(trough)	(peak)

epoch 30 epoch 20 epoch 8~12
 16~25 (Hz) 20~40 μV
 (occipital area) 가
 (central area)
 정상 성인에서의 수면단계
 18)
 (relatively low voltage, mixed frequency)가
 (Fig. 3).

10~30 μV

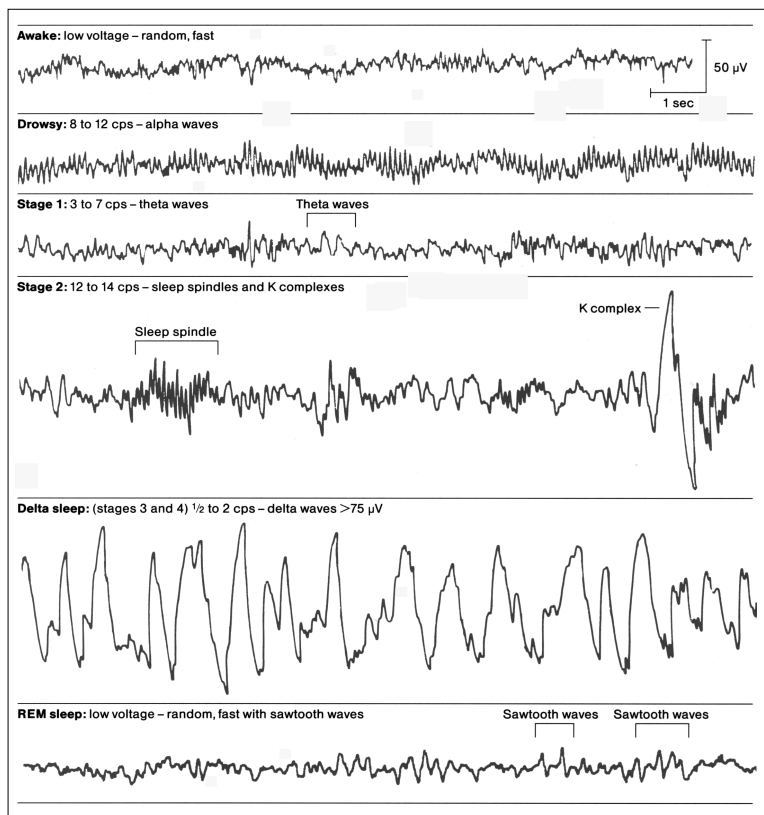


Fig. 3. Characteristic electroencephalographic patterns of human sleep stages (From Hauri P.J. The sleep disorders. Kalamazoo, MI : Upjohn : 1977).

(slow rolling eye movement) 1 . (movement arousal) 가
 . 가
 1 가
 . (to- nus) 2 2
 비렘수면(Non-rapid eye movement sleep, NREM sleep) 4가 가
 (Fig. 3). 1 가 (sleep spindles) K (K complex) .
 가 (, 2 가 1 가 3
). K 가 1
 1 (3)¹⁸⁾
 1 (relatively low voltage, mixed frequency activity) 0.5~1.5 12~14
 1 (vertex sharp waves) , 가 ²⁵⁾
 가 1 가 가
 (2
 3~7). (synchronous) 3~8
 1 (spindle rate)
²⁶⁾
 1 “ (incipient sleep spindles) 가 1
 1 2 ;
 1~2 0.5
 , 가 , ¹⁸⁾ 0.5 6~7
 , 15 .
 2 1 3 ²⁷⁾
 가 가
 , ²⁸⁾

:

29) (K) 1 가 . 가 K

가 (in - phase)

가 , K K

2 epoch

(interruption) 2 3, 4 18) 3, 4

K 2 . 3 (

가 ") 75 μ V 0.5~2 가 epoch

가 " 20% 50% . 4

0.5 18) K epoch 50%

K 가 3, 4

2 , K

4 , K

K 가 3, 4

" 2 , 3, 4 가

30)

가

2 K 렘수면(Rapid eye movement sleep, REM sleep)

3, 4 (tonic) (phasic)

2 (K ,

)

(vertex) (twitches)

(12~14) K 3가 가

가 2 K " (activated) "

1~3 K 2 " " (desynchronous) "

(sawtooth wave) V

26) , 18)

K

가 가

(vertex) 수면 중 생리적인 기능
 가 (1~2 자율신경계
 (頭字語) (REM) 가
 가 epoch 가
 (reflexes) 호흡계
 (twitches) 15 2가
 가 13~15%
 vement arousal) (mo - 가
 2 26) 가
 : 2 가
 K 가 가
 2 가
 2 (stage (hypoxic ventilatory drive)
 2 sleep interruption) 가 (hypercapnic ventilatory response)
 18) (1) 가
 가
 (2) 2
 K 가
 가 3 (가
 2)

체온조절

19)

30

넷 미 말

8

(alertness)

가)

가,

가

가

35)

중심 단어 :

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