



Capitol Sleep Medicine Newsletter

2441 Old Stringtown Road • Grove City, Ohio 43123

Phone: 614-317-9990 • Facsimile: 614-317-9905

www.CapitolSleepMedicine.com



Timothy J. Walter, M.D.



Uma Marar, M.D.

March 2007

• Volume 2

• Number 3

Dreaming though Depression – Part 2 Non-Rapid Eye Movement Sleep

Our last newsletter on dreaming through depression came to some interesting conclusions:

1. Although some antidepressant medications suppress REM sleep, this effect is neither necessary nor sufficient for clinical efficacy.¹

2. Frequent nightmares in a patient with depression have been associated with a fivefold increase in risk for a high suicidality score.²

3. Dreaming may actively moderate mood overnight.³

4. In patients with bipolar depression, as the mood improves moving from depression and closer towards mania, the latency to enter REM sleep gradually prolongs towards what would occur normally, or, as the patient is less and less depressed, their brain may require less and less REM sleep.⁴



FREDERICK LORD LEIGHTON

This newsletter will examine how neuroimaging during sleep has shed some light on the differences in Non-Rapid Eye Movement (NREM) sleep in the brains of sleeping depressed patients before and after treatment.

Normally, as one progresses from wakefulness into non-rapid eye movement (NREM) sleep, the frequency of the brainwaves decreases and a decrease in the metabolic rate throughout most of the cerebral cortex is also witnessed. One study in 29 unmedicated depressed patients and 28 people without depression using (18)FDG positron emission tomography (PET) demonstrated that the depressed patients showed smaller decreases than healthy subjects in the relative metabolism in broad regions of the frontal, parietal, and temporal cortices in the transition from waking to non-REM sleep. This suggests that in depressed patients, a hypermetabolic state in the ventral emotional neural system during waking persists into non-REM sleep.⁵ A simpler way to say this is that the NREM sleep of depressed patients may not be as deep as for those who are not depressed.

The anterior cingulate cortex is an older and central cortical structure of the frontal lobes that runs in the sagittal plane just above the thick band of white matter that connects both cerebral hemispheres, the corpus callosum. The role of the anterior cingulate cortex in behavior includes motor control and cognition but the majority of evidence seems to point to its role in motivation and drive, and that it may represent a unique portion of the frontal lobe that is able to translate intentions into actions.⁶ The anterior cingulate cortex is also richly connected to the limbic system, which in simple terms can be thought of as the emotional center of the brain.

What does the anterior cingulate cortex have to do with depression and with sleep? Normally as one drifts

off into NREM sleep, a decrease in anterior cingulate activity is seen. When comparing the activity of the anterior cingulate in NREM sleep of patients with depression to those without depression, an increase in anterior cingulate activity is seen in the NREM sleep of depressed patients. In other words, in depressed patients, the normal suppression of anterior cingulate activity in NREM sleep does not occur. Interestingly, treatment of depression seems to reverse this.⁷ A study of six elderly depressed patients and six age-matched comparison subjects underwent serial PET studies at baseline and after 2 weeks of paroxetine treatment (patients only). In the patients with depression, treatment with paroxetine resulted in a reduction of relative glucose metabolism in the anterior cingulate cortex and this persisted after recovery sleep and antidepressant treatment.⁸ The simpler explanation here is that in those patients who improved with treatment, the activity of the anterior cingulate cortex returned to normal. Sweet Dreams.....

¹ Dialogues Clin Neurosci. 2006;8(2):217-26

² Psychiatr Danub. 2006 Sep;18 Suppl 1:85

³ Psychiatry Res. 1998 Oct 19;81(1):1-8

⁴ J Affect Disord. 1996 Nov 25;41(2):125-33

⁵ Arch Gen Psychiatry. 2005 Apr;62(4):387-96

⁶ Nat Rev Neurosci. 2001 Jun;2(6):417-24

⁷ Am J Psychiatry. 2004 Oct;161(10):1856-63

⁸ Am J Psychiatry. 1999 May;156(5):683-9

2441 Old Stringtown Road
Grove City, Ohio 43123

5034 Walnut Street
South Bloomfield, Ohio 43103

11925 Lithopolis Road N.W.
Canal Winchester, Ohio 43110