

a dopamine receptor agonist, has less potential for abuse, and has not been associated with significant changes in weight. Modafinil may be useful for treating the negative symptoms of schizophrenia and antipsychotic-induced sedation.

Methods: Modafinil treatment of the negative symptoms of schizophrenia and antipsychotic-induced sedation was evaluated in two patients.

Table 1 Patient characteristics/medication histories.

Characteristic	Case 1	Case 2
Sex	Male	Male
Age (yr)	41	43
Race	White	White
Duration of schizophrenia (yr)	17	21
Hospitalized for schizophrenia	Yes	Yes
Medication history *	Clozapine Haloperidol Olanzapine† Quetiapine Risperidone Thiothixene	Clozapine† Dextroamphetamine Olanzapine†
Modafinil dose		
Starting	100 mg	200 mg
Current	200 mg	200 mg
Current concomitant medication	40 mg olanzapine	10 mg olanzapine

* Ineffective unless otherwise noted. † Partial positive response.

Results: Case 1 had failed numerous trials with different antipsychotic medications. He also experienced a marked gain in weight when novel antipsychotic medications were started, and became obese (BMI = 31.3). He had a partial response to olanzapine 20 mg/d, but was still mildly paranoid and exhibited significant negative symptomatology (eg, alogia, anhedonia, amotivation, hypersomnia, restricted affect, poor grooming). Olanzapine was increased to 30 mg/d, but induced sedation. Modafinil 100 mg/d was then added to the treatment regimen. Sedation was reduced, and negative symptoms improved within one week, resulting in brightened affect, increased quantity of speech, more socialization in group activities, and decreased isolation. After 1 month, modafinil was increased to 200 mg/d and olanzapine was increased to 40 mg/d. Over the next 4 months, negative symptoms continued to improve, enabling the patient to participate routinely in an exercise program. He lost 20 lbs during this period. Over the next 6 months, the patient's weight was maintained at 210 lb (BMI = 28.5), and his psychiatric condition stabilized. Case 2 was started on clozapine with good amelioration of positive symptoms, yet remained very "flat," nonspontaneous, and unmotivated. He also exhibited other negative symptoms (eg, poor personal hygiene, long, unkempt, dirty hair, poor grooming). After developing persistent leukocytopenia, the patient was switched to olanzapine 10 mg/d, but continued to exhibit negative symptoms. Dextroamphetamine 30 mg BID failed to improve his negative symptoms and was discontinued. Treatment with modafinil 200 mg/d was started, and within 1 month the patient was observed to be slightly more spontaneous in conversation. Daytime wakefulness and energy level increased

slightly, and there was a slight decrease in the need for sleep. Additionally, grooming and personal hygiene were noticeably improved. No changes in weight were noted at this early time.

Conclusions: These two case studies suggest that modafinil may be efficacious for improving the negative symptoms associated with schizophrenia and minimizing the sedating side effects associated with antipsychotic medications. The first case also suggests the possibility that these improvements may lead to increased patient activity and reversal of weight gain.

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GENDER AND AGE EFFECTS ON SLOW-WAVE ACTIVITY IN CHILDHOOD AND ADOLESCENT DEPRESSION

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Introduction: There is evidence to suggest that the amplitude and time course of slow-wave activity (SWA) during NREM sleep is abnormal in men, but not women, with depression. Moreover, the gender differences in depressed adults are 2-3 times larger than those observed in healthy controls (1-2). To date, it is not clear whether depressed children and adolescents also exhibit SWA abnormalities and if large gender differences also characterize younger depressed patients (3).

Methods: The present study evaluated SWA in 150 depressed outpatients 11-23 years of age (73 females, 76 males) compared to 97 healthy controls in the same age range (52 females, 45 males). All patients were symptomatic and unmedicated at the time of study. All study participants maintained regular sleep/wake cycles at home for 5 days, verified by actigraphy, and followed by 2 consecutive nights in the lab. Power spectral and period amplitude analysis was used to quantify SWA in each consecutive NREM period, and across the night. MANOVA tested interactions and repeated measures effects on SWA amplitude and power. Exponential regression analyses evaluated the SWA time course. Linear regressions assessed age-related changes in SWA separately for each group.

Results: Significant gender by group by age interactions were obtained for SWA amplitude and power in the first NREM period (p<.02). Overall, depressed males had the lowest SWA amplitude and power, particularly in those aged 16 and older. Moreover, the time course was abnormal in adolescent and young adult depressed males, with a lower accumulation of SWA in the first NREM period and the slowest dissipation across all NREM time. By contrast, the depressed females

showed no evidence of reduced SWA amplitude or power or an abnormal time course. Interestingly, the adolescent and young adult depressed girls showed the highest accumulation of SWA with the fastest dissipation compared to all other groups. All groups showed robust developmental declines in SWA amplitude and power ($p < .0001$), with the largest age-related change in depressed males. However, only depressed males showed a significant decline in the accumulation of SWA with increasing age ($p < .03$). None of the other groups showed significant age-related changes in the time course of SWA, although the exponential function was stronger after puberty in healthy males and females and in depressed females.

Conclusions: As reported in depressed adults, SWA abnormalities were evident in post-pubertal males with depression but not in females of the same age. Further, the time course of SWA appears to show an age-related decline only in this group. The findings suggest that early onset depression is associated with homeostatic abnormalities but it is strongly gender-dependent.

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SLEEP PATTERNS OF BATTERED WOMEN IN TRANSITIONAL HOUSING PROGRAMS

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Introduction: Battered women are subject to repeated deliberate, often severe abuse from their intimate male partners. Increasingly transitional housing programs are being offered to battered women as structured and supportive environments after they leave emergency shelters. However, clinical practice in transitional housing programs suggests that like women in emergency shelters¹, these battered women also have disturbed sleep. Sleep is a basic physiologic need and essential for healthy human functioning. Yet, previously there were no studies that described the sleep patterns of battered women in transitional housing programs. The purpose of this study was to describe the sleep patterns of battered women in transitional housing programs and the personal and environmental variables (e.g., age, health status, motherhood status, number of children, pregnancy status, spiritual, family and financial resources, ethnicity, employment status, and battering experience) that influence them. Research questions: (a) What are

the sleep patterns of battered women residing in transitional housing programs? (b) What is the relationship between personal and environmental variables and the sleep patterns of battered women residing in transitional housing programs?

Methods: A convenience sample (N = 29) of ethnically diverse battered women residing in transitional housing programs were recruited to the study. Sleep disruption, manifested subjectively as initiation insomnia or maintenance insomnia was assessed in the transitional housing program for 2 consecutive days and nights using the wrist actigraphy to estimate total sleep time and sleep maintenance. Participants also completed the General Sleep Disturbance Scale (GSDS), Spiritual Perspective Scale (SPS), Symptom Checklist-90-Revised (SCL-90R), Conflict Tactics Scale (CTS), Sleep Behavior Scale (SBS) [children's sleep], and a demographic sheet.

Results: Participants reported disturbed sleep an average of 3 out of 7 nights (2.77 + .84). The most common complaints were (1) frequent wakings, (2) feeling tired or fatigued during the day, (3) and waking too early. Objective sleep maintenance ranged from 98.6% to 56.5% (87.4% + 9.4%). Both personal and environmental variables were found to significantly affect sleep patterns. Objective sleep as measured by average total sleep time was significantly and inversely correlated with the number of children sleeping in the same room. ($r = -.42$, $p < .05$). Average number of wakings was significantly and inversely correlated with SPS score ($r = -.37$, $p < .05$). Finally, participants who experienced a high degree of physical and psychological distress including PTSD as measured by the SCL-90R ($r = .36$ to $.52$), also reported more troubled subjective sleep (GSDS).

Conclusions: Project findings increase the body of knowledge of battered women's sleep patterns and provide baseline data for the development of specific management strategies that could reasonably be implemented by transitional housing agencies and the women themselves.

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THE EFFECTS OF VAGUS NERVE STIMULATION (VNS) ON SLEEP IN DEPRESSION

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Introduction: Recent work has demonstrated the efficacy of vagus nerve stimulation (VNS) in treatment-resistant depression (1). Moreover, a preliminary study showed improved sleep architecture and enhanced strength of sleep EEG rhythms after 8 weeks of VNS treatment (2). The purpose of the present study was to extend these findings to a larger sample of treatment-resistant patients and to examine long-term effects on sleep

Methods: Eight treatment-resistant, severely depressed patients participated in study. Sleep studies were performed at