Evaluation of a Bedtime Medication Regimen on Daytime Sleep and Challenging Behaviors of an Adult With Intellectual Disabilities

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In recent years there has been increased interest about sleep disorders among people with developmental disabilities (DD). Typical problems include difficulty initiating and maintaining sleep (DIMS), early morning awakening, night terror, and challenging behaviors such as nighttime tantrums or refusal to remain in bed. With children and adolescents who have a developmental disability, the prevalence of clinically significant sleep disorders is in the range of 77-86%. Often, these problems are not resolved in youth but persist into adulthood.

The presence of a sleep disorder can have a detrimental effect during the day. To illustrate, a child or adult who sleeps poorly could experience fatigue and irritability during waking hours. In turn, this circumstance might be associated with daytime drowsiness, inability to sustain wakefulness, and negative interactions with parents and care-providers. Treating the sleep problem effectively would be one strategy to overcome the behavior difficulties encountered during the day. This brief case report describes the evaluation of an evening medication regimen on daytime somnolence and challenging behaviors of an adult who had intellectual disabilities (ID) and erratic sleep.

METHOD

INDIVIDUAL AND SETTING

Mr. A was a 32-year-old man diagnosed with severe ID, autistic disorder, and anxiety disorder (unspecified). He did not speak but communicated by pointing to pictures and using modified sign language. The focus of habilitation with Mr. A was teaching self-care, daily living, recreational, and vocational skills. He was able to complete most routines with verbal and physical prompting. Mr. A had a history of challenging behaviors that posed injury to self and others. His sleeping was characterized by irregular nighttime patterns (late sleep onset, frequent awakenings) and difficulty staying awake during the day. Information about family history and development through childhood was unknown.

Mr. A lived in a community-based residential setting serving adults with DD. On weekdays he attended a day-program from 9:00am-3:00pm, where he learned to perform a variety of vocational and domestic tasks. He resided in a suburban style house with another adult and received individual (“1:1”) supervision during waking and overnight hours. Mr. A had his own bedroom in the house.
Behaviors and Measurement

Four behaviors were targeted and measured during the study. The behaviors were recorded daily during Mr. A's waking hours (7:00am-11:00pm). One staff person in the day-program and residence setting was responsible for data collection. Using a frequency count measure, each occurrence of the behaviors was marked on a precoded form.

Aggression included physical contact initiated by Mr. A toward another person in the form of a pinch, grab, head-butt, bite, or punch. Both the actual completion of these responses and incidents where individuals avoided contact (attempts) were recorded. Self-injury was defined as Mr. A biting his hands, punching any part of his body with a closed fist, and scratching skin on his face, arms, and legs. A sleep attempt was anytime Mr. A was observed sleeping (eyes closed) and had to be cued "awake" by staff. Finally, protective holding was the application of physical restraint as per the guidelines specified on Mr. A's behavior support plan.

Procedures

Measurement was conducted during two phases of an A-B (quasi-experimental) design. Other than the administration of medication, both phases featured identical procedures. First, Mr. A had a written behavior support plan that informed staff how to intervene when he demonstrated aggression, self-injury, and sleep attempts. The plan also included procedures to prevent challenging behaviors and positively reinforce alternative responses.

The non-medication intervention with Mr. A was formulated subsequent to functional behavioral assessment (FBA) comprised of observation, analysis of antecedent-behavior-consequence (ABC) recording forms, and completion of the Motivation Assessment Scale. FBA results suggested that Mr. A engaged in challenging behaviors (a) in response to training "demands," (b) when he was unable to communicate his wants and needs effectively, (c) to elicit social attention from staff, (d) as a reaction to ambient conditions that were loud and "chaotic," and (e) following staff attempts to interrupt daytime sleep. Accordingly, several procedures comprised the behavior support plan:

(a) Positive reinforcement from staff (praise, smiles, approval) was presented to Mr. A when he displayed appropriate behaviors such as completing tasks, responding compliantly to requests, interacting cooperatively with peers, and following established routines. Noncontingent access to preferred activities (e.g., snacks) also was programmed throughout the day.
(b) Staff encouraged and prompted Mr. A to use picture pointing and sign language modalities to communicate requests during naturally occurring opportunities. Representative situations were asking for a food item during a snack period, a preferred “free time” activity, and a “break” from training interactions.

(c) Mr. A demonstrated “low intensity” challenging behaviors that frequently preceded aggression and self-injury. When these behaviors were detected (vocalizing above a conversational tone, body rocking, failing to sustain activity engagement), staff cued him to “relax” and make a “break” request. Once composed, Mr. A was directed to return to the ongoing activity.

(d) Contingent on aggression and self-injury, Mr. A was instructed to walk to a small room located in the day-program and residence settings, where he was supervised by one staff person until he was calm (absence of behaviors) for a 5-minute duration. When this criterion was achieved, he returned to ongoing activities.

(e) If Mr. A did not walk independently to the room when instructed by staff, a two-person physical escort was implemented in order to guide him gently through the transition. Once in the room, staff disengaged from him. However, if aggression and self-injury persisted for 30 consecutive seconds, two staff applied protective holding (physical restraint) to prevent possible injury. The protective hold was adapted specifically for Mr. A according to physical management intervention procedures that were approved by the state agency responsible for licensing habilitative-care programs. The protective hold was released as soon as Mr. A did not resist physical contact by staff for 60 consecutive seconds.

(f) In response to daytime sleep, one staff person instructed Mr. A to “wake up” and then reminded him of the activity he should be performing. If necessary, a gentle physical cue such as tapping Mr. A lightly on his shoulder was given. Staff paid close attention to Mr. A so that they could intervene quickly should they observe him trying to sleep. Virtually all sleep attempts lasted no more than 10-15 seconds.

**Pre-Medication Baseline.** During this phase, Mr. A’s bedtime was 11:00pm each evening. Before going to bed, he completed a brief preparation routine with staff. If Mr. A awoke between the hours of 11:00pm to 7:00am but remained in bed, staff did not attend to him. On occasions when he left his bed, staff checked on him to determine the circumstances (e.g., using the bathroom) and responded accordingly. If challenging behaviors were encountered, staff implemented the procedures specified on Mr. A’s intervention plan.
**Bedtime Medication Regimen.** Through consultation with a psychiatrist, Mr. A was prescribed trazodone (50 mg po hs) at bedtime. This medication was selected because it is sedating, has a low incidence of anticholinergic side effects, and is administered commonly with adults who have difficulty sleeping, usually associated with depression. Other than giving the medication to Mr. A, staff interacted with him, and implemented procedures, identically to the pre-medication baseline phase.

**RESULTS**

Outcome data are presented in Figures 1-3. Figure 1 shows the daytime frequency of aggression and self-injury recorded each month. Both behaviors decreased with the introduction of medication and remained at reduced frequencies throughout the 8-month phase of evaluation. For aggression, the average frequency each month was 5.5 during the pre-medication baseline phase and 2.1 during the evening medication regimen phase. For self-injury, the average frequency each month was 27.0 during the pre-medication baseline phase and 16.0 during the evening medication regimen phase.

The frequency of daytime sleep attempts each month is depicted in Figure 2. Similar to aggression and self-injury, the behavior decreased with medication. On average, staff had to interrupt sleep attempts 205 times per month during the pre-medication baseline phase and 50 times per month during the evening medication regimen phase.

The data presented in Figure 3 are the average frequency of protective holds implemented with Mr. A each month. During the pre-medication baseline phase, more than one protective hold was required monthly ($M = 1.2$). Only one protective hold ($M = .12$) was applied during the evening medication regimen phase.

**DISCUSSION**

An easily administered bedtime medication regimen was associated with reduced daytime sleep attempts, challenging behaviors, and physical intervention with an adult who had ID and comorbid diagnoses of autism and anxiety disorder. Although the functional influences on Mr. A's aggressive and self-injurious behaviors were not conclusive, many incidents occurred when staff had to interrupt his sleep attempts during the day. Furthermore, he frequently appeared fatigued and demonstrated challenging behaviors when training activities were presented. The decrease in aggression and self-injury, therefore, may have resulted because with fewer daytime sleep attempts subsequent to taking trazodone, the behavior-provoking interaction caused by staff interruption was experienced less frequently. Improved sleep also may have allowed Mr. A to respond more favorably to training.
interactions because he experienced them as less "demanding." Anecdotally, staff reported that in addition to the data-based confirmation of decreased challenging behaviors, Mr. A was more compliant, easier to work with, and generally better focused when taking medication.

A significant outcome with Mr. A was the near elimination of protective holding contemporaneously with medication administration. Again, we propose that with fewer sleep attempts and better responsiveness during the day, challenging behaviors were less likely to be encountered which in turn, reduced the requirement for physical restraint.

An additional explanation of the results with Mr. A is that medication had a global and indirect effect that translated to desirable behavior change. One possibility is that he had unrecognized depression that was resolved with trazodone. Because this medication has anti-anxiety properties, it also may have been therapeutic relative to Mr. A's diagnostic profile. These interpretations speak to the importance of performing a diagnostic evaluation to identify or exclude a psychiatric disorder as the etiology of sleep disturbance. Ruling in an underlying medication-responsive condition then would suggest pharmacologic intervention to resolve the sleep problem and as presented in this case report, possibly have a positive effect on daytime challenging behaviors.

Mr. A did not resist taking medication and was uniformly compliant with the evening regimen. Typical side effects of trazodone (indigestion, nausea, headaches) were not encountered, indicating he tolerated the medication well without requiring dosage adjustment. We add that priapism, another notable side effect of trazodone, was not reported by Mr. A or observed by staff responsible for his care. Although not included in this case study, the next intervention phase with Mr. A might be gradually decreasing the dosage of trazodone to determine whether it could be prescribed at lower amounts or possibly eliminated.

A notable flaw in this case study evaluation was the absence of evening sleep data. Sleep logs were recorded by overnight staff in Mr. A's residence but were done informally and could not be quantified accurately or converted to metric analysis. Subjective reports by staff to nursing personnel noted consistently that with the addition of medication, Mr. A had fewer nighttime disruptions and slept more soundly. We caution, of course, that without objective measurement of sleep duration, these impressions are speculative. Another limitation to the study was that medication was not withdrawn and re-introduced to demonstrate conclusively its therapeutic influence. Finally, the measurement of daytime behaviors was done systematically but did not include formal assessment of inter-observer agreement (reliability).

In conclusion, this case study adds to the small body of literature concerning the interaction between sleep disorders and daytime behavior support among people with DD. Our evaluation involved a pharmacologic intervention but there are several non-medication sleep enhancement strategies worthy of consideration. As posited by Carr and Neuman, "The relationship between sleep, specific psychiatric disorders, and pharmacological or behavioral intervention for these disorders in residents with mental retardation needs further examination." (p. 101)

REFERENCES
