

# Excessive daytime sleepiness among depressed patients

Celestine Okorome Mume\*

Department of Mental Health, Faculty of Clinical Sciences, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

**Background:** Excessive daytime sleepiness (EDS) has been reported among depressed patients in many populations. Many depressed patients seek medical attention partly to deal with EDS, but this sleep disorder is often overlooked in clinical practice.

**Objectives:** The objectives of this study were to determine the prevalence of EDS among depressed patients and determine its relationship with the severity of depression.

**Methods:** Sixty-seven patients diagnosed with depressive episode took part in the study. The severity of depression was rated using the 17-item Hamilton Depression Rating Scale (HDRS). EDS was evaluated using the Epworth Sleepiness Scale (ESS).

**Results:** The mean ESS score was 9.2 (SD = 2.8). EDS, defined as an ESS score  $\geq 10$ , was present in 44.8% of the depressed patients. The mean score on the HDRS was 14.8 (SD = 3.6), representing the mild–moderate depression range. ESS scores correlated highly and positively ( $r = 0.69$ ,  $p = 0.000$ ) with scores on the HDRS.

**Conclusion:** In the light of the high prevalence of EDS among depressed patients and its undesirable consequences, it is suggested that daytime sleepiness be evaluated in depressed patients.

Keywords: *excessive daytime sleepiness; depression; Epworth Sleepiness Scale; hypersomnia*

Received: 19 June 2009; Accepted in revised form: 4 August 2009; Published: 7 January 2010

Depression is a common psychiatric condition. It is treatable but it is associated with considerable social and occupational impairment, as well as with high direct and indirect health care costs (1, 2). Although excessive daytime sleepiness (EDS) is generally not one of the symptoms required for the diagnosis of depression, it is common among depressed patients.

The average adult human spends about one-third of his life in sleeping (3). Since man functions essentially in the day, the greater part of sleep occurs at night. There is thus a need as well as a desire on the part of man to maintain a degree of wakefulness that will allow for optimal functioning during the day. The whole concept and essence of EDS refer to a state or situation in which it is difficult or impossible for the individual to maintain the required level of daytime wakefulness for optimal functioning.

Sleep debt arising from sleep deprivation is one of the most common causes of EDS (4, 5). Other common causes include sleep disorders (such as narcolepsy, idiopathic hypersomnia and obstructive sleep apnea) and drugs that have sedative/hypnotic properties (6). Equally important causes are certain medical and psychiatric conditions (6, 7). Medical causes of EDS include

head trauma, cerebrovascular disease, and brain tumors. Also, depression is another recognized cause of EDS. There is also evidence for heritability of daytime sleepiness and depressive symptoms, suggesting that EDS and depression may have some genes in common (8).

The manifestations of EDS range from drowsiness and reduced performance to episodes of involuntary sleep in spite of efforts to remain awake (9). Individuals who have EDS also have increased risk of road traffic or industrial accidents (10–14). EDS occurs among depressed individuals and is a predictor of and a risk factor for depression in certain populations (15–18). Except for a recent publication (19), there is hardly any information on EDS in the Nigerian population. The aim of the present study was to provide information on EDS in depressed patients in Nigeria.

## Materials and methods

The study was carried out in the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, in South-Western Nigeria. The study was approved by the Ethics and Research Committee of the OAUTHC. All the patients who participated gave written informed consent.

Patients who were recruited into this study were diagnosed with depressive episode using the criteria of the International Classification of Diseases, 10th edition (ICD – 10) (20). Those who had psychotic symptoms or who had co-morbid physical disorders were excluded from the study. The patients included were those who presented for the first time in their life and had not been started on medication. This was to ensure that any reported daytime sleepiness was not due to medications. Seventy-eight consecutive patients who met the criteria and gave consent to participate were recruited into the study.

Severity of depression was rated using the English language version of the 17-item Hamilton Depression Rating Scale (HDRS). Max Hamilton originally published the HDRS in 1960 and reviewed and evaluated it subsequently (21–25). The scale is clinician-rated and is currently one of the most commonly used scales for rating depression in medical research and practice. Nine of the 17 items are scored on a five-point scale, while the remaining eight items are scored on a three-point scale. The more severe the depressive symptoms, the higher are the score. Total score can range from 0 to 54. A score of 10–13 is regarded as mild depression, 14–17 as mild to moderate depression, and >17 as moderate to severe depression (Appendix 1).

EDS was evaluated in the patients using the English language version of the Epworth Sleepiness Scale (ESS). This is a self-administered, eight-item, well-validated, and widely used subjective sleepiness scale. The patients were asked to score the likelihood of falling asleep in eight different situations. Scores on the ESS range from 0 to 24, with higher scores indicate greater likelihood of sleepiness. A score of 10 but less than 18 is considered sleepy, while a score of 18 or more is considered very sleepy (Appendix 2).

Some previous studies variously defined EDS as an ESS score > 10 (26), > 11 (19), or  $\geq 10$  (27). In this study, EDS was defined as a score equal to or above the whole number immediately higher than the mean ESS score.

The data were analyzed using the Statistical Package for the Social Sciences, Version 16 (SPSS 16.0). Regression analysis was done with ESS score and HDRS score as dependent and independent variables, respectively.

## Results

The data from 67 of the 78 patients (85.9%) were included in the analysis. The data on the other 11 patients were incomplete and thus excluded. Of the 67 patients included, 42 were females (62.7%) and 25 were males (37.3%). The age range of the patients was 31–55 years with a mean of 41.4 years (SD = 7). The socio-demographic characteristics of the participants are shown in Table 1.

The mean ESS score was 9.2 (SD = 2.8), and so the cut-off point for EDS was taken as an ESS score  $\geq 10$ . Thirty

**Table 1.** Socio-demographic characteristics of the patients

Variable	Male	Female
Age range (years)		
31–40	6	12
41–50	12	22
51–55	7	8
Sex	25	42
Marital status		
Single	5	3
Married	12	24
Separated	6	12
Divorced	0	3
Widowed	2	0

of the 67 patients (44.8%) had EDS defined as ESS score of equal to or greater than 10. The mean score on the HDRS was 14.8 (SD = 3.6).

The correlation ( $r$ ) between the ESS score and the score on the HDRS was 0.69 ( $p = 0.000$ ). Forty-eight percent ( $r^2 = 0.48$ ) of the total variance in the ESS score is accounted for by its linear relationship with the score on the HDRS. The results of the regression analysis are shown in Table 2.

## Discussion

EDS is one component of hypersomnia (the other component being prolonged nocturnal sleep). EDS refers to sleepiness that occurs when the individual is reasonably expected to be awake and alert.

**Table 2.** Results of regression analysis of ESS score and HDRS score as dependent and independent variables, respectively

Variable	Value
Correlation	
Pearson correlation ( $r$ )	0.69
Significance	0.000
Model summary	
$R$	0.69
$R^2$	0.48
Adjusted $R^2$	0.47
ANOVA	
df	1, 65
$F$	59.47
Significance	0.000

Note: ESS, Epworth Sleepiness Scale; HDRS, Hamilton Depression Rating Scale.

Many of the patients (44.8%) had EDS defined as ESS score of  $\geq 10$ . In a similar study, 57.2% of depressed patients had EDS and their ESS scores correlated highly ( $r = 0.85$ ) with ratings on the Beck Depression Inventory (27). Some other studies also suggested a significant association between daytime sleepiness and severity of mood symptoms (15, 28). In the present study, there was also a high and positive correlation between EDS and severity of depression.

There is thus enough indication that EDS is a regular accompaniment of depression. It has been suggested that EDS and depression have some genes in common and might both be inherited (8). EDS has also been found to be strongly associated with suicidal ideation in depressed patients (27). It is thus clear that any clinical evaluation of depressive illness that does not include the evaluation of EDS is incomplete. EDS in a setting of depressive illness may respond to energizing antidepressants such as fluoxetine or bupropion.

The clinician should be familiar with features of obstructive sleep apnea, narcolepsy, and idiopathic hypersomnia, all of which are common causes of hypersomnia and any of which may also coexist with depression. Obstructive sleep apnea is characterized by snoring and periods of apneic attacks during sleep with daytime symptoms of fatigue and sleepiness. Narcolepsy is characterized by a tetrad of EDS (many sleep episodes and drowsiness), cataplexy (sudden decrease or loss of muscle tone often precipitated by intense emotion such as laughter or anger), sleep paralysis (which occurs on falling asleep or on waking up, with the individual unable to move or speak), and hypnagogic (sleep onset) hallucinations. All narcolepsy patients experience excessive sleepiness, most have cataplexy and some have three or four features of the narcoleptic tetrad. Nighttime sleep may also be disrupted with repeated awakenings. The features of idiopathic hypersomnia include chronic sleepiness without cataplexy or other features of narcolepsy.

In view of the established association between EDS and depression, and given the harmful consequences of both conditions (operating separately or jointly), there is a need for proper clinical evaluation of EDS in every case of depressive illness. Unfortunately, there are no facilities in Nigeria for proper evaluation of sleep complaints. It is therefore suggested that an effort be made by appropriate national and state authorities to establish facilities for dealing with sleep complaints. In terms of human resources, there are not enough personnel in the field of sleep medicine in the country. It is hoped that with adequate and proper facilities in place, the number of personnel in this field will gradually increase. In the meantime, clinicians should be aware of the magnitude of the problem of EDS, particularly among depressed patients, and do their best to assist the patients.

## Conflict of interest and funding

The author has not received any funding or benefits from industry to conduct this study.

## References

1. Wells KB. Caring for depression in primary care: defining and illustrating the policy context. *J Clin Psychiatry* 1997; 58: 24–7.
2. Badamgarav E, Weingarten S, Henning J, Knight K, Hasselblad V, Gano A, et al. Effectiveness of disease management programs in depression: a systematic review. *Am J Psychiatry* 2003; 160: 2080–90.
3. Roth T, Roehrs T. Sleep organization and regulation. *Neurology* 2000; 54: S2–7.
4. Gupta RM. Approach to the sleepy patient. *Med Health R I*. 2002; 85: 86–9.
5. Pagel JF. Excessive daytime sleepiness. *Am Fam Physician* 2009; 79: 391–6.
6. Edd EM, Flores S. Sleepiness or excessive daytime somnolence. *Geriatr Nurs*. 2009; 30: 53–60.
7. Dauvilliers Y, Paquereau J, Bastuji H, Drouot X, Weil JS, Viot-Blanc V. Psychological health in central hypersomnias: the French harmony study. *J Neurol Neurosurg Psychiatry* 2009; 80: 636–41.
8. Lessov-Schlaggar CN, Bliwise DL, Krasnow RE, Swan GE, Reed T. Genetic association of daytime sleepiness and depressive symptoms in elderly men. *Sleep* 2008; 31: 1111–7.
9. Bittencourt LR, Silva RS, Santos RF, Pires ML, Mello MT. Excessive daytime sleepiness. *Rev Bras Psiquiatr*. 2005; 27: 16–21.
10. Ulfberg J, Carter N, Talback M, Edling C. Excessive daytime sleepiness at work and subjective work performance in the general population and among heavy snorers and patients with obstructive sleep apnea. *Chest* 1996; 110: 659–63.
11. Roehrs TA, Carskadon MA, Dement WC, et al. Daytime sleepiness and alertness. In: Kryger MH, Roth T, Dement WC, editors. *Principles and practice of sleep medicine*. Philadelphia, PA: W.B. Saunders; 2000. p. 43–52.
12. Lindberg E, Carter N, Gislason T, Janson C. Role of snoring and daytime sleepiness in occupational accidents. *Am J Respir Crit Care Med*. 2001; 164: 2031–5.
13. Melamed S, Oksenberg A. Excessive daytime sleepiness and risk of occupational injuries in non-shift daytime workers. *Sleep* 2002; 25: 315–22.
14. Garbarino S. Sleep disorders and road accidents in truck drivers. *G Ital Med Lav Ergon*. 2008; 30: 291–6.
15. Hublin C, Kaprio J, Partinen M, Heikkilä K, Koskenvuo M. Daytime sleepiness in an adult Finnish population. *J Intern Med*. 1996; 239: 417–23.
16. Breslau N, Roth T, Rosenthal L, Andreski P. Sleep disturbance and psychiatric disorders: a longitudinal epidemiological study of young adults. *Biol Psychiatry* 1996; 39: 411–8.
17. Silber MH. Sleep disorders. *Neurol Clin*. 2001; 19: 173–86.
18. Fava M. Daytime sleepiness and Insomnia as correlates of depression. *J Clin Psychiatry* 2004; 65: 27–32.
19. Adewole OO, Adeyemo H, Ayeni F, Anteyi EA, Ajuwon ZO, Erhabor GE, Adewole TT. Prevalence and correlates of snoring among adults in Nigeria. *Afr Health Sci*. 2008; 8: 108–13.
20. World Health Organization. *The ICD – 10 classification of mental and behavioural disorders*. Geneva: WHO; 1992.
21. Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry* 1960; 23: 56–62.
22. Hamilton M. Assessment of change in psychiatric state by means of rating scales. *Proc R Soc Med*. 1966; 59: 10–3.

23. Hamilton M. Development of a rating scale for primary depressive illness. *Br J Soc Clin Psychol.* 1967; 6: 1–5.
24. Hamilton M. Standardised assessment and recording of depressive symptoms. *Psych Neurol Neurochir.* 1969; 72: 201–5.
25. Hamilton M. Rating depressive patients. *J Clin Psychiatry* 1980; 41: 21–4.
26. Joo S, Baik I, Yi H, Jung K, Kim J, Shin C. Prevalence of excessive daytime sleepiness and associated factors in the adult population of Korea. *Sleep Med.* 2009; 10: 182–8.
27. Chellappa SL, Araújo JF. Excessive daytime sleepiness in patients with depressive disorder. *Rev Bras Psiquiatr.* 2006; 28: 126–9.
28. Young TB. Epidemiology of daytime sleepiness: definitions, symptomatology and prevalence. *J Clin Psychiatry* 2004; 65: 12–6.

**\*Celestine Okorome Mume**

Department of Mental Health  
 Faculty of Clinical Sciences  
 Obafemi Awolowo University  
 Ile-Ife, Osun State, Nigeria  
 Email: celemume2000@yahoo.com

**Appendix 1. The Hamilton Depression Rating Scale**

1 Depressed mood	0 1 2 3 4
2 Guilt feelings	0 1 2 3 4
3 Suicide	0 1 2 3 4
4 Insomnia – early	0 1 2
5 Insomnia – middle	0 1 2
6 Insomnia – late	0 1 2
7 Work and activities	0 1 2 3 4
8 Retardation – psychomotor	0 1 2 3 4
9 Agitation	0 1 2 3 4
10 Anxiety – psychological	0 1 2 3 4
11 Anxiety – somatic	0 1 2 3 4
12 Somatic symptoms GI	0 1 2
13 Somatic symptoms – General	0 1 2
14 Sexual dysfunction – menstrual disturbance	0 1 2
15 Hypochondrias	0 1 2 3 4
16 Weight loss – by history	0 1 2
– by scales	0 1 2
17 Insight	0 1 2

Note: Total score refers to the sum of 0, 1, 2, 3 or 4 for items 1–17.

**Appendix 2. The Epworth Sleepiness Scale**

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you. Use the following scale to choose the most appropriate number for each situation.

- 0 = would never doze or sleep.
- 1 = slight chance of dozing or sleeping.
- 2 = moderate chance of dozing or sleeping.
- 3 = high chance of dozing or sleeping.

Situation	Chance of dozing or sleeping
1 Sitting and reading	–
2 Watching TV	–
3 Sitting inactive in a public place	–
4 As a passenger in a car for an hour without a break	–
5 Lying down to rest in the afternoon	–
6 Sitting and talking to someone	–
7 Sitting quietly after lunch without alcohol	–
8 In a car stopped for a few minutes in the traffic	–
Total score (add the scores up)	–