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Excessive daytime sleepiness in psychiatric disorders: Prevalence, correlates and clinical significance

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ABSTRACT

This study examined the prevalence of excessive daytime sleepiness, as measured by the Epworth Sleepiness Scale (ESS), in a cohort of adult psychiatric patients. A total of 300 psychiatric outpatients and an additional 300 healthy controls completed the ESS. Excessive sleepiness was defined by a score of ≥10. The prevalence of excessive daytime sleepiness was higher in the psychiatric group (34%) than the control group (27%), and the mean ESS score was also significantly higher in the psychiatric group. The prevalence of excessive sleepiness was higher for female psychiatric patients, but this pattern was not found in the control group. Surprisingly, there was no difference in ESS score between patients taking antipsychotic medication and those not taking antipsychotic medication. The data suggest that excessive daytime sleepiness is a significant issue in general adult psychiatry, but this must be interpreted against a relatively high prevalence in the normal population.

1. Introduction

Excessive daytime sleepiness (EDS) is a common complaint and is associated with many disorders. It is also thought to be reasonably common in the general population, although prevalence estimates vary considerably (2–33%: Hublin et al., 1996; Ohayon et al., 1997; Hara et al., 2004; Bixler et al., 2005; Ng and Tan, 2005; Sanford et al., 2006). This variability probably reflects the different definitions of EDS adopted by different studies, as well as sample size and the extent to which the studied samples represent the true general population. The behavioral and functional consequences of EDS are well documented, and include impairment of work performance and social roles, reduced subjective well-being, cognitive slowing and an increased risk of accidents (Horne and Reyne, 1999; Brassington et al., 2000; Foley et al., 2001; Ohayon and Vecchierini, 2002).

The best *objective* standards for defining EDS are the Multiple Sleep Latency Test (MSLT: Carskadon et al., 1986) and the Maintenance of Wakefulness Test (MWT: Mitler et al., 1982). However, these are time-consuming laboratory tests that are not suited to screening large cohorts. Large-scale surveys of EDS are usually conducted with self-report scales including, among many others, the Stanford Sleepiness Scale (SSS; Hoddes et al., 1973), the Karolinska Sleepiness Scale (KSS; Åkerstedt and Gillberg, 1990) and the Epworth Sleepiness Scale (ESS: Johns, 1991, 1994). The ESS is more commonly used in psychiatric settings, has good reliability (Knutson et al., 2006) and, in contrast to the SSS and KSS, measures daytime sleepiness in several different contexts. For the ESS, the most commonly accepted criterion for EDS 'caseness' is a score of ≥10 or ≥11: opinion is divided on which of these is more appropriate. Moreover, the limited correlation between the ESS and more objective tests has been commented on (Chervin et al., 1997). An ESS score should, therefore, be interpreted cautiously, and the scale should not be treated as though it were a diagnostic instrument.

Previous studies show that there is an association between excessive sleepiness and psychiatric disorder, depression in particular (Ohayon et al., 1997; Whitney et al., 1998; Fava, 2004; Hasler et al., 2005; Renko et al., 2005; Kaneita et al., 2006; Theorell-Haglöw et al., 2006). However, epidemiological studies have not focused specifically on excessive sleepiness within clinical psychiatric populations, and the degree to which excessive sleepiness is a prevalent and relevant issue in such populations is unknown. Although a recent review (Hawley, 2006) concluded that EDS appears to be a clinically significant issue in general psychiatry, the supporting evidence was rather limited.

There is, however, little doubt that EDS can be a feature occurring in specific psychiatric disorders. Two recent studies suggest a high prevalence of EDS in depressed outpatients: Chellappa and Araújo (2006) reported that 57% of depressed outpatients were excessively sleepy; and a similar descriptive study by Lundt (2005) found a prevalence of 47%. Both studies defined EDS by a score of ≥10 on the ESS, and found a significant correlation between ESS scores and

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depression rating scale scores. It has also been suggested that EDS is a common feature of residual depression and that it should be treated to reduce the chance of depressive relapse (Stahl et al., 2003; Thase et al., 2006). Iatrogenic EDS may also be a relevant issue in psychiatry since many psychiatric drugs (e.g. anti-psychotics) have a sedating effect. However, current evidence in support of this assertion is indirect and not entirely persuasive (Mullen et al., 2001; Hofer et al., 2002; Levoyer et al., 2004).

The aims of the current study were: (i) to examine the prevalence of EDS in a general psychiatric outpatient population, (ii) to compare this with a normal control sample and (iii) to investigate variability in EDS across sub-groups of psychiatric patients.

2. Methods

The ESS was administered to two groups of participants: (i) psychiatric outpatients and (ii) normal controls. The Hertfordshire Research Ethics Committee gave approval for the study and informed consent was taken at the time the ESS was completed.

2.1. Clinical sample

Three hundred patients were recruited from psychiatry outpatient clinics. This was as consecutive a sample as was feasible within practical constraints (for example, some patients did not meet the inclusion criteria and some were not willing to participate). All included patients were: aged between 18 and 65 years; able to read and write in English; either new or follow-up cases under clinical attention for any Axis 1 or Axis 2 disorder (except where a substance misuse disorder was the main focus of clinical attention); not exhibiting a form of dementia or mental handicap.

The ESS was administered to patients immediately before, during or immediately after a clinical consultation. Clinicians were neither asked to make any reference to the nature of the study, nor to sleep issues more generally. The clinician recorded the following information for each patient: demographic data (age, sex, employment status, etc.); diagnosis based on the current focus of clinical attention; current medications for psychiatric and other medical conditions; a Clinical Global Impression of Severity Scale (CGI-S: Guy, 1976) score. The rating on the CGI was based upon 'severity of mental illness *as a whole*' rather than, as is usually the case, with reference to a specific disorder or condition.

2.2. Control sample

Three hundred people, all aged between 18 and 65, were recruited from local organizations and via colleagues of the investigators. Some were recruited via their attendance at a local job centre, and some were attending a primary care clinic for non-medical reasons (e.g. accompanying a relative). Health status and medication data were not collected from controls.

2.3. Analyses

The primary analysis compared the prevalence of EDS caseness, as defined by an ESS score of ≥ 10, in the clinical and control samples; and the secondary analysis compared mean ESS scores between samples. Exploratory analyses examined associations between demographic and medication variables and the degree of EDS.

3. Results

3.1. Demographics and medical background

The clinical sample had a mean age of 41.8 ($\pm$13.1) years and 61% were female. One hundred and twenty (40%) were in full or part-time employment and 25 of these undertook shift and/or night-work.

The principal focus of clinical attention was: a mood or anxiety disorder in 191 (64%) cases; schizophrenia or a related disorder in 61 (20%) cases; personality disorder in 25 (8%) cases; and other Axis 1 disorders in 12 (4%) cases. In the remaining 11 (4%) cases, Axis 1 and 2 disorders attracted clinical attention in equal measure.

All but 29 (10%) patients were taking at least one psychiatric medicine. In 188 (63%) cases this included an antidepressant. The majority of these were taking an SSRI ($n=120$) or an SNRI ($n=34$). One hundred and fifteen (38%) patients were taking an antipsychotic agent. The most common anti-psychotics were olanzapine ($n=34$), risperidone/Risperdal Consta ($n=17$), quetiapine ($n=15$), clozapine ($n=10$), amisulpiride ($n=8$), and depixol ($n=7$). Off-label and low-dose prescribing of anti-psychotics for depression, anxiety and personality disorder was noted to be common. Thirty-four (11%) patients were taking hypno-sedatives, most commonly diazepam, and 112 (37%) patients were taking medication for non-psychiatric medical conditions.

Clinical Global Impression of Severity (CGIs) scores (Fig. 1) reflected relatively minor degrees of illness or disorder, with 222 (74%) patients having scores of 1, 2 or 3 (absent, borderline or mild illness, respectively).

In the control sample, 66% of subjects were female. Mean age was 40.4 ($\pm$12.1) and 247 (82%) were in full or part time employment (of whom 51 worked nights and/or shifts).

3.2. Comparing excessive sleepiness in patients and controls

The prevalence of EDS caseness (i.e. an ESS score ≥ 10) was higher in the clinical sample (34%) than in the control sample (27%), but this difference reached only borderline statistical significance (*Chi-square* [1] = 3.49, $P=0.06$). However, the mean ESS score was significantly higher in the clinical sample (7.7 [$\pm$4.8] vs. 6.8 [$\pm$4.5]; t [598] = 2.3, $P=0.021$). Fig. 2 shows the distribution of ESS scores for patients and controls. A multiple regression was run using the ESS score data from all 600 participants with the following variables entered as possible predictors: psychiatric status (patient vs. control), age, sex, children (yes or no), employment (employed vs. unemployed), employment hours (part-time vs. full-time), shift work (yes or no), night work (yes or no). The only significant variable to enter the model was psychiatric status ($P=0.002$, tolerance = 0.85).

3.3. Additional exploratory analyses

3.3.1. Gender

The prevalence of ESS caseness was higher in female patients (38%) than male patients (26%) (*Chi-square* [1] = 4.416, $P=0.036$). Female patients also scored higher than male patients (8.3 $\pm$ 5.1 vs. 6.8 $\pm$ 4.2; t [298] = 2.674, $P=0.008$). In the control group there was no significant gender difference in the prevalence rates of ESS caseness (Females: 25% vs. Males: 30% *Chi-square* [1] = 0.807, $P=0.37$) or mean ESS score (6.7 $\pm$ 4.2 vs. 7.2 $\pm$ 5, respectively; t [298] = -0.97, $P=0.33$).

3.3.2. Antipsychotic medications

The prevalence of ESS caseness was 31% in patients taking antipsychotics ($n=115$) and 35% in those not taking antipsychotics (*Chi-square* [1] = 0.466, $P=0.84$) and mean ESS score was 7.1 ($\pm$4.9) and 8.1 ($\pm$4.7), respectively (t [298] = 1.767, $P=0.078$).

3.3.3. Other

No associations were found in the clinical sample between ESS caseness or ESS score and any of the following variables: age, employment status (employed vs. unemployed), parental status (children under

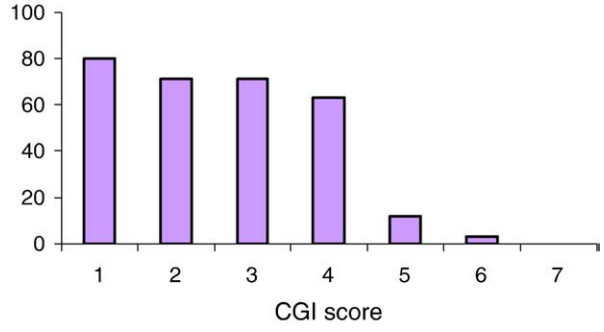

Fig. 1. Distribution of CGI(s) scores in the clinical sample.