

## Use of health care services in seasonal affective disorder<sup>†</sup>

JOHN M. EAGLES, FIONA L. HOWIE, ISOBEL M. CAMERON,  
SAMANTHA M. WILEMAN, JANE E. ANDREW, CAROL ROBERTSON  
and SIMON A. NAJI

**Background** Little is known about the presentation and management of seasonal affective disorder (SAD) in primary care.

**Aims** To determine the use of health care services by people suffering from SAD.

**Method** Following a screening of patients consulting in primary care, 123 were identified as suffering from SAD. Each was age- and gender-matched with two primary care consultants with minimal seasonal morbidity, yielding 246 non-seasonal controls. From primary care records, health care usage over a 5-year period was established.

**Results** Patients with SAD consulted in primary care significantly more often than controls and presented with a wider variety of symptoms. They received more prescriptions, underwent more investigations and had more referrals to secondary care.

**Conclusions** Patients with SAD are heavy users of health care services. This may reflect the condition itself, its comorbidity or factors related to the personality or help-seeking behaviour of sufferers.

**Declaration of interest** Funded by the Scottish Office Department of Health and Grampian Primary Care NHS Trust.

Within the past two decades, seasonal affective disorder (SAD) has been increasingly diagnosed and treated. The concept of SAD, at least initially, was viewed by some with scepticism (Eastwood & Peter, 1988), but it has steadily gained in credence and is included in DSM-IV (American Psychiatric Association, 1994) as major depressive episodes with seasonal pattern. Winter symptoms of lowered mood, increased lethargy, increased appetite and increased sleep length are very common away from the equator (Kasper *et al*, 1989), giving rise to debate about the point where a dividing line between 'health' and 'illness' might most appropriately be drawn on what appears to be a normally distributed continuum. Predictably, when SAD is defined more narrowly, estimates of community prevalence are lower but still significantly high at 1.4–3.5% (Blazer *et al*, 1998; Eagles *et al*, 1999). Given these levels of community prevalence, it seems almost certain that the majority of sufferers go undiagnosed and untreated. We hypothesised that sufferers of SAD would be consulting in primary care with increased frequency, that they would often present with physical manifestations of SAD and that they would generate increased numbers of prescriptions, tests/investigations and referrals for specialist care.

### METHOD

The subjects in this study were identified first through the screening procedures described in previously published papers (Eagles *et al*, 1998, 1999; Andrew *et al*, 2001) and the service use data reported in the present paper derive from the aggregated sample from the two previous studies. Eleven large group practices based in and around Aberdeen participated, covering a total population of close to

120 000 people and employing about 60 general practitioners. Patients aged 16–64 years were approached while waiting to see their general practitioner during the month of January and were invited to complete the Seasonal Pattern Assessment Questionnaire (SPAQ; Rosenthal *et al*, 1987). Of 7927 people attending their general practitioner, 5249 (66.2%) adequately completed the SPAQ, and those who fulfilled the criteria for SAD on this instrument were invited for interview. Of 505 who were cases of SAD on the SPAQ, 274 (54.3%) attended for interview before the end of February. Of these, 127 (46.4%) also fulfilled DSM-IV criteria for recurrent major depressive disorder with seasonal pattern (American Psychiatric Association, 1994) and scored at least 15 on the Structured Interview Guide for the Hamilton Rating Scale for Depression–Seasonal Affective Disorder version (SIGH-SAD; Hamilton, 1967; Williams *et al*, 1988; Terman & Williams, 1994), with a score of at least 6 on the atypical symptoms questions. These 127 patients, fulfilling all three sets of criteria for SAD were designated 'interview-confirmed cases'. Of these 127 patients, 123 had primary care case records available and thus were included in the present study.

Each interview-confirmed case of SAD (none of whom had been diagnosed previously with SAD) was matched by gender and by age (to within 1 year) with two subjects who had attended the same general practice during January but who scored 6 or less on the global seasonality score of the SPAQ, this score indicating that they rated themselves as experiencing little or no significant seasonal fluctuation in their well-being. These 246 people were designated as 'non-seasonal controls'. It is perhaps worth noting that although the control group rated themselves as being without meaningful seasonal fluctuation in well-being, no rating was made of their current mood and the control group was not intended to be one without possible depressive symptomatology of a non-seasonal nature.

The written and computerised primary care records of interview-confirmed SAD cases and non-seasonal controls were scrutinised. Use of health care services was recorded over a 5-year period, stretching back from May of the year in which they completed the screening procedures. The following data were recorded:

<sup>†</sup>See editorial, pp. 394–395, this issue.

- (a) numbers of primary care consultations;
- (b) symptoms presented at each consultation, which were classified, where possible, by 'bodily system' (cardiovascular, gastrointestinal, etc.); specific note was made of symptoms that previously had been described as associated with SAD, namely pain, headache, infection, tiredness/lethargy, weight gain/bingeing, sleep disturbance, depression, anxiety/panic, palpitations, alcohol misuse, diarrhoea/irritable bowel syndrome and premenstrual syndrome;
- (c) prescriptions issued, again classified by bodily system and sub-classified by the notations used in the *British National Formulary* (Joint Formulary Committee, 1999);
- (d) tests and investigations ordered;
- (e) specialist referrals;
- (f) hospital admissions.

After complete description of the study to the subjects, written informed consent was obtained.

### Statistical analysis

Data within the above parameters of health care use were not normally distributed and therefore the Mann-Whitney test was used to compare median values between SAD cases and controls, while recognising that non-parametric statistics may be less sensitive to differences between groups. The  $\chi^2$  test was used to compare the proportions of subjects in the two groups having symptoms, prescriptions and test/investigations, classified into either zero or at least unity on each parameter. This classification was used because the majority of subjects tended to have had none, one or two within each parameter, with only a few having a large number. Because as many as 20 comparisons between SAD cases and controls were sometimes made, *P* values of <0.025 were taken as a conservative indication of statistical significance.

## RESULTS

### Screened and interviewed subjects

Details of the screening and interviewing processes have been given elsewhere (Eagles *et al.*, 1998, 1999). In brief, 34% of 7937 surgery attenders did not complete a SPAQ, and there are no data to estimate whether these non-responders would have differed in their likelihood of suffering seasonal

morbidity. Of the 505 cases of SAD on the SPAQ, nearly half did not attend for interview before the end of February. People who were not interviewed were significantly younger than those who were (Eagles *et al.*, 1999), presumably reflecting willingness and/or availability to participate, but no other differences were detected.

### Patients and controls

Among the interview-confirmed SAD patients, 21 (17%) were male and 102 (83%) were female, with double these numbers and the same percentages for controls. The mean age of patients was 39 years (s.d.=10.8) and was the same as that of controls (s.d.=11.0).

### Main findings

Table 1 shows some of the main differences in use of health care services between patients with SAD and controls. Apart from hospital admissions (which were rare in

both groups), there was excess use of services on all parameters by the patients with SAD.

### Symptoms presented

Tables 2 and 3 give details of the symptoms presented more often by sufferers of SAD at consultations over 5 years. Table 2 categorises symptoms by bodily system. Nearly 15% of all recorded symptoms could not be classified reliably, and these were grouped as miscellaneous/unclassifiable. This arose either because the presenting complaint was not sufficiently clearly recorded or, more usually, because the aetiology of the symptom (e.g. nausea, chest pain, fatigue) could not be assigned reliably to a particular bodily system. Patients with SAD presented with symptoms in a greater number of different bodily systems (median 4 (interquartile range=3-5) *v.* 3 (2-4) in controls; Mann-Whitney *P*<0.001); 59%, as against 30% of controls, presented with symptoms in four or more different systems. Table 3

**Table 1** Service use over a 5-year period by patients with seasonal affective disorder (SAD) and by non-seasonal controls

	Patients with SAD <sup>1</sup> (n=123)	Controls <sup>1</sup> (n=246)	95% CI for differences between medians	Mann-Whitney <i>P</i> values
Primary care consultations	34 (19-48)	23 (14-38)	4-12	<0.001
Prescriptions	28 (15-48)	18 (10-31)	4-12	<0.001
Tests/investigations	6 (3-12)	4 (2-8)	0-2	0.021
Specialist referrals	3 (1-4)	1 (0-3)	0-1	<0.001
Hospital admissions	0 (0-0)	0 (0-0)	0-0	0.27

1. Values are medians and interquartile ranges.

**Table 2** Symptoms presented (classified by bodily system) over a 5-year period more commonly by patients with seasonal affective disorder (SAD) than by non-seasonal controls

Symptom type	Median number (interquartile range) of presentations		Per cent presenting at least once	
	Patients with SAD (n=123)	Controls (n=246)	Patients with SAD (n=123)	Controls (n=246)
Gastrointestinal	2 (0-5)*	1 (0-3)*	69.9	63.0
Psychiatric/psychological	4 (1-11)***	0 (0-2)***	79.7†††	45.9†††
Urinary	1 (0-3)***	0 (0-2)***	57.7††	41.1††
Musculoskeletal	4 (1-11)*	3 (1-6)*	85.4	77.2
Miscellaneous/unclassifiable	5 (2-9)***	4 (1-7)***	92.7	89.0

\*Mann-Whitney *P*<0.025; \*\*\*Mann-Whitney *P*≤0.001; †† $\chi^2$  *P*<0.01 (1 d.f.); ††† $\chi^2$  *P*≤0.001 (1 d.f.).

relates to symptoms that have been linked previously to the presentation of SAD. Among these symptoms, it is reassuring that those of depression, tiredness/lethargy and weight gain/bingeing are more common because these would be regarded as central components of the disorder. Anxiety/panic also are more common, which presumably accounts for the excess of presentations with palpitations. The three types of symptoms that might generally be considered as less clearly linked to SAD but were significantly more common in patients with SAD were pain, infection and premenstrual syndrome.

### Prescriptions issued

Table 4 presents the data on prescriptions issued more often to patients with SAD during the 5 years studied. To be most meaningful, some of these data are shown in prescriptions for a particular bodily system, whereas others are subdivided into more specific types of medication. When prescriptions were grouped by bodily system, patients with SAD received prescriptions covering more of the 12 bodily systems (median 6 (interquartile range=4–8) *v.* 6 (4–7); Mann–Whitney  $P=0.006$ ); among patients with SAD,

36% received prescriptions covering eight or more bodily systems, as compared with 20% of controls.

### Tests and investigations

Three tests and investigations were carried out more frequently on patients with SAD. Median numbers of full blood counts (Mann–Whitney  $P=0.01$ ) and thyroid function tests and erythrocyte sedimentation rates (ESRs) (Mann–Whitney  $P=0.002$  for both) were higher. During the 5 years, a greater proportion of patients with SAD had thyroid function tests (42% *v.* 26%,  $\chi^2=7.92$ , 1 d.f.,  $P=0.005$ ) and ESRs (33% *v.* 18%,  $\chi^2=9.55$ , 1 d.f.,  $P=0.002$ ).

### Specialist referrals

Three types of specialist referrals were more common among patients with SAD. Reassuringly, psychiatry/psychology referrals were more common for patients with SAD, of whom 27.6% were referred as against 8.1% (Mann–Whitney  $P<0.001$ ) of controls. The two other specialities that had significantly increased numbers of referrals were physiotherapy (Mann–Whitney  $P=0.005$ ) and gynaecology (Mann–Whitney  $P=0.016$ ). Referrals in general were higher among patients with SAD (see Table 1), with 52% (as against 28% of controls) having three or more specialist referrals during the 5-year period.

## DISCUSSION

### Summary of findings

We found that patients with SAD, when compared with two age-matched and gender-matched controls, were much heavier users of health care services; they saw their general practitioners more frequently, they received more prescriptions, they had more tests and investigations and they were referred to more secondary care specialists. Not only were patients with SAD high consumers of health care, but they presented with a greater diversity of different symptoms. Presentations with depression, anxiety, weight gain and lethargy were predictable, but it is more noteworthy that patients with SAD also presented more often with pain, infection and premenstrual syndrome and with symptoms in the urinary, musculoskeletal and gastrointestinal systems. The prescriptions they received reflected not only high rates of presentation but a more diverse

**Table 3** Specific symptoms presented over a 5-year period more often by patients with seasonal affective disorder (SAD) than by non-seasonal controls

Symptom type	Median number (interquartile ranges) of presentations		Per cent presenting at least once	
	Patients with SAD (n=123)	Controls (n=246)	Patients with SAD (n=123)	Controls (n=246)
Pain	6 (2–3)**	4 (1–9)**	91.1	85.8
Infection	9 (4–15)**	7 (3–12)**	96.7	94.3
Tiredness/lethargy	0 (0–1)***	0 (0–0)***	25.2†††	11.1†††
Weight gain/bingeing	0 (0–0)**	0 (0–0)**	8.1††	1.6††
Depression	1 (0–4)***	0 (0–0)***	55.3†††	18.7†††
Anxiety/panic	0 (0–2)**	0 (0–1)**	39.0	27.6
Palpitations	0 (0–0)***	0 (0–0)***	4.9††	0††
Premenstrual syndrome	0 (0–0)***	0 (0–0)***	17.1†††	5.7†††

\*\*Mann–Whitney  $P<0.01$ ; \*\*\*Mann–Whitney  $P\leq 0.001$ ; †† $\chi^2 P<0.01$  (1 d.f.); ††† $\chi^2 P\leq 0.001$  (1 d.f.).

**Table 4** Prescriptions over a 5-year period issued more often to patients with seasonal affective disorder (SAD) than to non-seasonal controls

Type of prescription	Median number (interquartile range) of prescriptions		Per cent receiving at least one prescription	
	Patients with SAD (n=123)	Controls (n=246)	Patients with SAD (n=123)	Controls (n=246)
Gastrointestinal	1 (0–3)*	0 (0–1.25)*	52.0	42.7
Cardiovascular	0 (0–1)*	0 (0–0)*	32.5†	20.3†
Respiratory	0 (0–2)*	0 (0–1)*	48.8	41.9
Hypnotic/anxiolytic	0 (0–1)***	0 (0–0)***	30.9†††	15.5†††
Antidepressant	1 (0–5)***	0 (0–0)***	54.5†††	20.3†††
Analgesic	1 (0–3)***	0 (0–2)***	66.7†††	47.6†††
Antibiotics	6 (2–12)***	4 (2–9)***	91.9	89.0
Sex hormones	0 (0–1)***	0 (0–0)***	35.8†††	19.9†††

\*Mann–Whitney  $P<0.025$ ; \*\*\*Mann–Whitney  $P\leq 0.001$ ; † $\chi^2 P<0.025$  (1 d.f.); ††† $\chi^2 P\leq 0.001$  (1 d.f.).

variety of presenting symptoms than controls. The higher number of tests ordered no doubt reflects diagnostic uncertainties, whereas full blood counts and thyroid function tests are likely to represent appropriate investigation of low mood and/or tiredness and lethargy. Not only psychiatrists and psychologists, but also physiotherapists and gynaecologists, saw more patients with SAD than they saw controls.

These findings are novel and have significance with regard to the diagnosis, aetiology, comorbidity and management of SAD. These issues are potentially wide-ranging and the discussion below will attempt to provide a summary rather than do full justice to all of them.

### Analogies with service use in non-seasonal depression

In contrast with SAD, there is a considerable literature on the presentation, the identification, the treatment and the service use of patients with other types of depression in primary care settings. Because these findings constitute comparative data that may be of relevance to our own study, a very brief précis of some relevant points will follow.

Patients with depression present commonly in primary care but their depression often goes undetected (Paykel & Priest, 1992). Depression frequently is associated with somatic symptoms, especially in primary care settings (Paykel & Priest, 1992; Brody *et al*, 1995), and not only do somatic presentations render detection of depression less likely (Brody *et al*, 1995) but patients with depression who somatise are often particularly frequent consulters in primary care (Portegijs *et al*, 1996). Depressed patients are generally high consumers of health care services. They are high users of primary care services, they receive more tests and investigations, they have more out-patient visits and they are more often admitted to general hospitals (Simon *et al*, 1995; Rost *et al*, 1998). It is striking, however, that within this high demand for health care only a very small proportion of the expense relates to the treatment of the depressive disorder itself (Rost *et al*, 1998).

There are clear similarities between our study's findings and those for non-seasonal depression. Our own study design did not permit comparison of subjects with SAD against subjects with non-seasonal depression, because our initial selection

through screening was based on seasonality of symptoms and not on depression, but such a comparison would be potentially edifying.

### Other studies of SAD in primary care

Our own group previously has reported increased rates of consultation in a smaller comparison of 33 patients each against one control (Eagles *et al*, 1998), and only when a larger sample was compared with two controls per case could a small autumn and winter excess of consultations be demonstrated among patients with SAD (Andrew *et al*, 2001). The most striking finding was of an increased rate of consultation by patients with SAD across the months of the years studied.

Only one other study has looked directly at SAD among patients consulting in primary care. Schlager *et al* (1995) screened a 'convenience sample' of 303 patients attending a family medicine ambulatory centre in New York state during January and February and found that between 8.9% and 9.6% (the figure depending upon how the SPAQ was interpreted) satisfied the criteria for SAD. Schlager *et al* (1995) did not attempt to quantify service use but noted that over half of the patients with SAD reported seasonal pain variation.

Other studies have used less direct methods. Blacker *et al* (1997) found a peak of primary care presentations with major depression in the winter months, although this did not reach statistical significance, and they suspected that any winter excess in depression might be linked to higher rates of infectious illness. Other studies have found peaks of depressive presentations and antidepressant prescribing in winter (Williams & Dunn, 1981; Skegg *et al*, 1986), although such peaks may occur also during the summer months (Skegg *et al*, 1986). Thus, hitherto there has been little direct evidence about the presentation of SAD, or the burden for care it imposed, in primary care settings.

### Comorbidity of SAD

Anxiety was reported by 72% of the first series of patients with SAD described by Rosenthal *et al* (1984) and may be regarded more as a central component of the disorder than as a comorbid phenomenon. Panic disorder previously has been

associated with winter depression (Halle & Dilsaver, 1993) and the fact that there were nine presentations with palpitations among our patients with SAD and none among our controls may further testify to this link.

Premenstrual depression also was reported commonly among Rosenthal *et al*'s (1984) original series, and the relationship between SAD and premenstrual syndrome since has been established further (Maskall *et al*, 1994). Our patients with SAD presented more commonly than controls with premenstrual problems and were more likely to receive prescriptions for sex hormones. The comorbidity of premenstrual syndrome and SAD may be important to note because seasonal premenstrual syndrome can respond to light therapy (Maskall *et al*, 1994).

There is good evidence of a link between winter depression and disordered eating, certainly among identified clinical samples (e.g. Blouin *et al*, 1992). Again, the importance of this association may relate to the response of seasonal bulimia to light therapy (Lam *et al*, 1994). In our study, although patients with SAD presented with weight gain or binge eating more often than controls did, such presentations were relatively uncommon.

Seasonal pain was reported in Schlager *et al*'s (1995) primary care sample of SAD sufferers and has been described also in about 50% of a clinical sample of patients with SAD (Dilsaver *et al*, 1993). Our findings of increased presentations with pain and increased analgesic prescriptions among patients with SAD are in accord with those studies. The relationship between pain and depressed mood, however, may not be a seasonal phenomenon (Von Knorring, 1975).

Patients in our study presented more often than controls did with infections and received more prescriptions for antibiotics, and people with SAD can report that they are especially prone to winter infections. Our findings could be seen as related to 'help-seeking behaviour' or may represent a comorbid biological phenomenon. Immune function certainly fluctuates seasonally (Maes *et al*, 1994) and reduced winter immune function may be mediated through light deprivation via vitamin D (Rosen *et al*, 1991); sufferers from winter depression have been shown to receive reduced daylight exposure during winter (Espiritu *et al*, 1994).

### Other possible reasons for high service use

Patients with SAD might become high service users because of the SAD itself or because of associated comorbid conditions, but their service use patterns may have other explanations. One prosaic possibility is that depressive symptoms give rise to frequent primary care contact, which facilitates recognition, investigation and treatment of unrelated conditions that otherwise would have remained undiagnosed (Simon *et al*, 1995). Depression also may lead to an amplification of symptoms and thus to a greater propensity to seek, and to expect, medical assistance (Barsky, 1992). Our own study design was such that, in order to become a confirmed case of SAD, patients had to attend an additional interview and it is possible that this served to select people with SAD who were more focused upon their own health.

Other possible explanations have been explored in a previous paper (Eagles *et al*, 1998). Hotopf (1994) has suggested that SAD may constitute one component of 'environmental hypersensitivity', a condition characterised by multiple physical symptoms and somatisation and in which media-popularised 'diseases of fashion' can be adopted readily by the patient. Our method of patient identification – they did not self-diagnose and we actively screened and recruited them – perhaps makes this view less plausible. It may be that personality factors are of importance. Sufferers of SAD may be more neurotic, with a tendency to adopt an external locus of control (Murray *et al*, 1995), and these factors may give rise to an amplification of dysphoria and an increased likelihood of seeking medical advice.

### Service implications

Patients with SAD are consulting frequently in primary care and are high users of health care services but, perhaps partly because of the variety of symptoms with which they present, their SAD goes undiagnosed and untreated; none of the patients in our study had a diagnosis of SAD and in only a very few (from what was recorded in their case records) had the possibility ever been considered. Light therapy has been found to be beneficial for sufferers of SAD and to have few adverse effects (e.g. Eastman *et al*, 1998). However, study participants often have comprised self-diagnosed

### CLINICAL IMPLICATIONS

- Patients with seasonal affective disorder (SAD) make heavy demands on a range of health care services.
- Sufferers of SAD present with a wide variety of physical complaints.
- Generally SAD is not diagnosed, probably contributing to high numbers of tests and prescriptions.

### LIMITATIONS

- Patients with SAD were compared only with non-seasonal controls and not with patients suffering from non-seasonal depression.
- Although relatively strict diagnostic criteria for SAD were deployed, it was not possible to validate the diagnosis externally.
- It is not known whether identification and treatment of patients in primary care with SAD influence morbidity or service use.

JOHN M. EAGLES, FRCPsych, Royal Cornhill Hospital, Aberdeen; FIONA L. HOWIE, BSc, ISOBEL M. CAMERON, MA, SAMANTHA M. WILEMAN, PhD, JANE E. ANDREW, MSc, Health Services Research Unit, Foresterhill, Aberdeen; CAROL ROBERTSON, MRCPsych, Royal Cornhill Hospital, Aberdeen; SIMON A. NAJL, BSc, Health Services Research Unit, Forester Hill, Aberdeen, UK

Correspondence: Dr John M. Eagles, Royal Cornhill Hospital, Cornhill Road, Aberdeen AB25 2ZH, UK. Tel: 01224 663131, Fax: 01224 557433, e-mail: john.eagles@gpct.grampian.scot.nhs.uk

(First received 2 March 2001, final revision 29 June 2001, accepted 2 July 2001)

volunteers referred on to specialist centres and this efficacy may not equate to that among patients in primary care. Our own group's trial (Wileman *et al*, 2001) did not demonstrate superiority of bright white light over dim red light in patients with SAD identified in primary care, some of the subjects being those included in the present study. Therefore, before primary care professionals embark on any attempt at 'assertive identification' of patients with SAD, it would be important to have evidence that treatment does indeed lower morbidity among such patients and perhaps, therefore, results in reduced use of health services.

### ACKNOWLEDGEMENTS

We are grateful to all general practitioners and practice managers who helped to organise the screening and interviewing of their patients. Drs Mysore Dharmendra and Douglas Gray conducted patient interviews. The secretarial work was done by Lana Hadden.

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