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Brief report

Dates of birth and seasonal changes in well-being among 4904 subjects completing the seasonal pattern assessment questionnaire

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Abstract

Background: Abnormal distributions of birthdates, suggesting intrauterine aetiological factors, have been found in several psychiatric disorders, including one study of out-patients with Seasonal Affective Disorder (S.A.D.). We investigated birthdate distribution in relation to seasonal changes in well-being among a cohort who had completed the Seasonal Pattern Assessment Questionnaire (SPAQ).
Method: A sample of 4904 subjects, aged 16 to 64, completed the SPAQ. 476 were cases of S.A.D. on the SPAQ and 580 were cases of sub-syndromal S.A.D. (S-S.A.D.). 92 were interview confirmed cases of S.A.D. Months and dates of birth were compared between S.A.D. cases and all others, between S.A.D. and S-S.A.D. cases combined and all others, and between interview confirmed cases and all others. Seasonality, as measured through seasonal fluctuations in well-being on the Global Seasonality Scores (GSS) of the SPAQ, was compared for all subjects by month and season of birth.
Results: There was no evidence of an atypical pattern of birthdates for subjects fulfilling criteria for S.A.D., for the combined S.A.D./S-S.A.D. group or for interview confirmed cases. There was also no relationship between seasonality on the GSS and month or season of birth.
Limitations: Diagnoses of S.A.D. made by SPAQ criteria are likely to be overinclusive.
Conclusion: Our findings differ from studies of patients with more severe mood disorders, including psychiatric out-patients with S.A.D. The lack of association between seasonality and birthdates in our study adds credence to the view that the aetiology of S.A.D. relates to separable factors predisposing to affective disorders and to seasonality.

Keywords: Seasonal Affective Disorder; Birth rate; Seasons; Depressive disorder

1. Introduction

Since the 1970s, evidence of atypical season of birth patterns among people with various psychiatric disorders has accumulated. These findings yield important clues about pathogenesis, most plausibly of environmental

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factors operating during foetal development, while studies showing normal birthdate distributions focus attention on other aetiological possibilities.

Evidence is strongest for a winter/early spring excess of births among people who develop schizophrenia (Torrey et al., 2000; Castrogiovanni et al., 1998). There is evidence of an excess birth rate in the spring/early summer months among sufferers of anorexia nervosa (Rezaul et al., 1996; Eagles et al., 2001; Watkins et al., 2002), and a report of increased suicide rates among people born at this same time of year (Salib and Cortina-Borja, 2006). A recent large study detected no association between month of birth and prevalence of autistic spectrum disorders (Kolevzon et al., 2006).

For severe affective disorders, there appears to be an excess in winter/early spring births similar to that in schizophrenia (Torrey et al., 2000; Castrogiovanni et al., 1998; Hare, 1975; Mino et al., 2000) but one large Danish study found a normal birth date distribution in bipolar affective disorder (Mortensen et al., 2003). The first published study on Seasonal Affective Disorder (Pjrek et al., 2004) reported on an Austrian cohort of patients, finding an excess of spring/summer births. We investigated whether a similar pattern prevailed among a large cohort of subjects previously screened for seasonal changes in well-being.

2. Methods

Our data derive from an epidemiological study of Seasonal Affective Disorder (S.A.D.) in northeast Scotland (Eagles et al., 1999). The sample comprised 4904 subjects aged 16 to 64 years, of whom 65% were female, all of whom completed the Seasonal Pattern Assessment Questionnaire (SPAQ) (Rosenthal et al., 1987) which is the most widely used screening questionnaire for S.A.D. The 4904 subjects were composed of 4557 patients who were attending their general practitioners in January, plus a randomly selected community sample of 347 subjects. No differences had been detected in SPAQ scores between these two groups of subjects. The overall participation rate was 73%.

The SPAQ gives rise to diagnostic criteria for S.A.D. and for the milder variant sub-syndromal-S.A.D. (S-S.A.D.) (Kasper et al., 1989). In our cohort, 476/4904 (9.7%) satisfied SPAQ criteria for S.A.D. and a further 580/4904 (11.8%) satisfied SPAQ criteria for S-S.A.D. The SPAQ contains a section which yields a Global Seasonality Score (GSS) which comprises six areas of well-being (mood, sleep, energy, social activity, weight and appetite). Each area is rated on a 0 to 4 scale, so that GSS ranges from 0 to 24 and denotes overall severity of seasonal changes.

Table 1
Months of birth of subjects with SPAQ rated Seasonal Affective Disorder (S.A.D.), Sub-syndromal Seasonal Affective Disorder (S-S.A.D.) and comparison groups

Month	S.A.D. — *N* (%)	Not S.A.D. — *N* (%)	S.A.D. plus S-S.A.D. — *N* (%)	No winter problems — *N* (%)
January	39 (8.2)	374 (8.4)	86 (8.1)	327 (8.5)
February	37 (7.8)	337 (7.6)	81 (7.7)	293 (7.6)
March	53 (11.1)	378 (8.8)	108 (10.2)	323 (8.4)
April	44 (9.2)	362 (8.3)	85 (8.0)	321 (8.3)
May	39 (8.2)	397 (8.9)	90 (8.5)	346 (9.0)
June	33 (6.9)	395 (8.7)	91 (8.6)	337 (8.8)
July	41 (8.6)	400 (9.0)	100 (9.5)	341 (8.9)
August	39 (8.2)	326 (7.4)	76 (7.2)	289 (7.5)
September	31 (6.5)	376 (8.3)	73 (6.9)	334 (8.7)
October	44 (9.2)	399 (9.0)	96 (9.1)	347 (9.0)
November	37 (7.8)	306 (7.0)	72 (6.8)	271 (7.0)
December	39 (8.2)	378 (8.5)	98 (9.3)	319 (8.3)
All months	476	4428	1056	3848

In our original study (Eagles et al., 1999), subjects satisfying SPAQ criteria for S.A.D. were invited for interview to determine whether they also satisfied DSM-IV criteria (American Psychiatric Association, 1994) for recurrent major depressive episodes with seasonal pattern. Interviewed subjects (seen in January or February) also completed the Structured Interview Guide for the Hamilton Rating Scale — Seasonal Affective Disorder Version (SIGH-SAD) (Williams et al., 1988; Terman and Williams, 1994). An "interview confirmed case" of S.A.D. scored a minimum of 15 on the SIGH-SAD, with at least 6 on the atypical symptoms questions, while also fulfilling DSM-IV criteria. The "interview confirmed cases" numbered 92, this being 41% of the 225 interviewed subjects.

The re-analysis of our data sought to investigate any possible relationship between our cohort's birthdates and seasonal pathology as rated in the SPAQ. Subjects with S.A.D. on the SPAQ were compared against all others, and a coalesced group of subjects with "winter problems" (all those fulfilling criteria for either S.A.D. or S-S.A.D.) were compared against all other subjects. Since season of birth effects may be gender specific (Eagles et al., 1995), comparisons were also conducted separately for males and for females. The 92 interview confirmed cases of S.A.D. were compared against all other subjects. After adjustment for the number of days in each month, the proportion of cases and controls born in each month was calculated and two statistical tests were conducted. Firstly, a chi-squared test investigated relationships between month of birth and case/control status. Secondly, the non-parametric Watson's