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Research report

Mood seasonality: A cross-sectional study of subjects aged between 10 and 25 years

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Abstract

Background: Most of the earlier studies on mood seasonality were conducted in adults and there are few available data on children and adolescents. In two cross sectional surveys, we examined the role of age and gender on seasonal sensitivity in subjects aged 10 to 25 years.
Methods: In survey one, the Seasonal Pattern Assessment Questionnaire for Children and Adolescents (SPAQ-CA) was administered to 1709 subjects (845 females and 864 males) from 10 to 17 years. In survey two, the Seasonal Pattern Assessment Questionnaire (SPAQ) was administered to 1867 subjects (1061 females and 806 males) from 18 to 25 years.
Results: Only in survey one was a significant positive correlation found between age and Global Seasonality Score (GSS) ($r=.29$; $p<.00001$). Significant gender differences were found at age 14 years and above in survey one, and at all ages in survey two.
Conclusions: The results support the hypothesis that seasonal sensitivity is higher in female subjects.

Keywords: Mood seasonality; Affective disorder; Gender differences; Adolescent

1. Introduction

Winter Seasonal Affective Disorder (SAD) is characterised by recurrent depressive episodes that occur annually in the fall and winter (Rosenthal et al., 1984b). Though less frequent, a summer variant of SAD was described by Wehr et al. (1987) characterised by recurrent episodes of depression in summer seasons.

SAD was immediately recognised by the scientific community. It was originally considered a subclass of major affective disorders in DSM-III-R (American Psychiatric Association, 1987), and then a "seasonal specifier" for major depressive episodes in the DSM IV (American Psychiatric Association, 1994).

Winter SAD symptoms include: low motor activity and low energy levels, depressed mood, reduced social activity and hypersomnia. Other symptoms may include weight increase, craving for hypercaloric food and mood deterioration in the evening. The disorder usually begins between 20 and 30 years and the mean age of patients is about 40 years. A SAD subsyndrome (sSAD) has also been described, characterised by lower intensity

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SAD symptoms and is considered a SAD prodrome (Kasper et al., 1989a,b).

Seasonality appears to be regularly distributed throughout the population (Kasper et al., 1989b; Rosen et al., 1990). Individuals with SAD lie to one end of the continuum while individuals whose moods are not susceptible to seasonal variations lie at the other. Individuals experiencing mild vegetative symptoms during winter or summer similar to those of SAD (subsyndromal SAD) fall in the middle. To evaluate seasonal mood variations, Rosenthal et al. (1984a) developed the Seasonal Pattern Assessment Questionnaire (SPAQ) which is the most widely used self-reporting questionnaire for normal and clinical seasonal mood variations. SPAQ was not developed as a diagnostic instrument but principally as a screening tool (Rosenthal et al., 1987), and its psychometric properties have been shown to be good (Magnusson et al., 1997; Young et al., 2003; Parslow et al., 2004). SPAQ has been translated in several languages: Italian (Muscettola et al., 1995; Natale et al., 2003), Spanish (Goikolea et al., 2003; Adan et al., 2006), Dutch (Mersch et al., 1999a), Japanese (Ozaki and Ono, 1995; Pallos et al., 2005), Chinese (Han et al., 2000).

Women are usually more susceptible to seasonal sensitivity than men. In clinical studies the ratio of women/men who suffer from SAD is about four/one (Kasper et al., 1989b; Rosen et al., 1990) and in normative studies the finding does not change (Mersch et al., 1999a; Parslow et al., 2004; Natale et al., 2005). In a sample of "normal" Swedish adults, Chotai et al. (2004) reported over twice the rate of SAD in females than in males and a decrease in seasonal problems with age increase. Rohan and Sigmon (2000) have also reported gender differences in an American university student sample; females had higher Global Seasonality Scores (GSS) than males, especially with regards to the items relating to mood, appetite and energy levels. Pallos et al. (2005) explored gender differences in a sample of Japanese graduate students (aged 22–30), finding higher GSS scores in females versus males.

In a sample of junior high school students (mean age = 16.0, SD = 0.7) and adult workers (mean age = 39.1, SD = 11.2) Imai et al. (2003) found the rate of SAD in students (2.57%) to be twice that in workers (1.16%). This indicated that besides gender age might also play an important role in seasonal sensitivity. If adults suffer from SAD children and adolescents also suffer and the rate of SAD in children and adolescents is estimated at about 3–4% (Carskadon and Acebo, 1993; Swedo et al., 1995). At the beginning of puberty, the rate of SAD increases, especially in females suggesting that female hormones may have a role in the disorder.

To evaluate the rate of SAD from a developmental prospective, Swedo et al. (1995) proposed an "ad hoc" modified SPAQ: the Seasonal Pattern Assessment Questionnaire for Children and Adolescent (SPAQ-CA). The questionnaire can be used for research and clinical purpose but, as with SPAQ, SAD diagnosis always needs to be confirmed by clinical interview. The main difference between SPAQ-CA and SPAQ regards the section assessing Global Seasonality Score (GSS); in SPAQ-CA, eleven items evaluate seasonal changes while in SPAQ seasonal sensitivity is based on six items.

No study has analysed mood seasonality in Italian pre-adolescent and adolescent subjects. The primary aim of our survey was to analyse mood seasonality differences in a large sample of students, aged from 10 to 25 years. We also sought to analyse gender differences to try and shed light on the possible role of female gender on seasonal sensitivity.

2. Survey 1

In survey one, we investigated mood seasonality in a large sample of pre-adolescent and adolescent subjects. The Italian version of SPAQ-CA, recently validated by Tonetti et al. (submitted for publication), was used. If mood seasonality is positively related to puberty, we would expect to find a significant increase in GSS in adolescence. If sexual hormones play a primary role, we would expect an increase in GSS at 12–13 years. Since differences in SAD incidence between male and female subjects have been reported in the literature, this survey also analysed gender difference in a sample of adolescents with a view to assessing when such differences become significant.

3. Method

The Italian version of SPAQ-CA was administered to a sample of 1709 children and adolescents (845 females and 864 males). Subjects ranged in age between 10 and 17 years (mean = 12.90, SD = 1.93) (10 year olds: 105 males, 94 females; 11 year olds: 163 males, 146 females; 12 year olds: 146 males, 146 females; 13 year olds: 131 males, 120 females; 14 year olds: 125 males, 120 females, 15 year olds: 100 males, 99 females; 16 year olds: 81 males, 97 females; 17 year olds: 13 males and 23 females). The sample was selected by school grade and the questionnaires were administered to children and adolescents attending the last year of primary school (10 years), three years of secondary school (11–13 years) and the first three years of high school (14–17 years). We sent letters to the headmasters of five primary schools, four secondary schools and four high schools to obtain their consent. The questionnaires