Seasonal changes in affective state in samples of Asian and white women

Abstract Seasonality of the affective state has been reported to vary in direct proportion to latitude in temperate regions. The frequency of seasonal affective disorder (SAD) and the severity of the symptoms associated with it have been reported to be greater in higher than in lower latitudes. In addition, recent research has suggested a genetic loading for SAD. Most of the research on the seasonality of affect has been done in high latitude areas, seasonal mood cycles have been infrequently investigated in tropical areas, and no study has so far measured and compared seasonal changes in affect and behaviour in indigenous and populations non-indigenous to high latitudes. To rule out the biases associated with retrospective designs, a prospective longitudinal study was designed to investigate seasonal mood variations in indigenous white and non-indigenous Asian populations. Since previous research has indicated the excessive vulnerability of women to winter depression, it was decided to measure seasonality of the affective state only in women. To examine the relative effects of genetic predispositions and physical environment, the Asian group was further divided into “Asian” and “Asian-British”. The former group comprised women who were living in England but who had been born and had spent considerably more time in their country of origin, while the latter group consisted of women who were born in England and who had lived there all their lives. The three groups of 25 women each were matched for age and socio-economic status, and were interviewed every month for 1 year using the Hospital Anxiety and Depression Scale (HAD), a Behavioural Change Inventory (BCI), the Ladder Scale of General Well-being (LSW) and a Monthly Stress Inventory (MSI). One retrospective scale was administered at the end of the study year to compare the extent of seasonal change in affect with that on the HAD-depression subscale. The results showed that seasonal depression peaked in winter in all three groups, with the incidence of winter depression being highest in the Asian group. Seasonal changes on several dimensions of behaviour were in the direction of winter depression for all three groups. States other than depression (anxiety and general well-being) did not show any seasonal variation. Hours of daylight was found to be the best predictor of seasonal variation in mood among environmental and psychosocial variables. There was no evidence to support a genetic hypothesis for SAD.

Introduction

The observation that light and darkness can influence human mood can be traced back to ancient times, but it was not until 1984 that the annual occurrence of depression in winter was recognised medically and described thoroughly (Rosenthal et al. 1984). Population studies conducted all over the world have shown a strong association between the seasons and the incidence of depression, and between the severity of symptoms of winter depression and the latitude of residence. Research on the seasonality of the affective state, although mostly done in temperate areas (Potkin et al. 1986; Rosen et al. 1990; Rosen and Moghadam 1991), has also been extended towards Arctic regions (Lingjaerde et al. 1986; Booker and Hellekson 1992), and the findings are similar in that winter-associated low feelings are reported more by people living in the northern than in the southern parts of the regions. Only a few population-based studies have been reported from tropical and subtropical lower latitude areas where summer depression has been found to be more prevalent than winter depression, presumably due to greater heat and humidity (Ito et al. 1992; Kamo et al. 1992; Ozaki et al. 1995). In fact, no winter seasonal
affective disorder (SAD) was found at a latitude as low as 15°N (Quezon city, Philippines). Among the North American and European studies, Sarasota is at the lowest latitude where a prevalence study of SAD has taken place (Rosen et al. 1990). The prevalence rates for SAD (1.4%) and subsyndromal seasonal affective disorder S-SAD (2.6%) are also among the lowest recorded.

Indeed, great photoperiodic differences exist between lower and higher latitudes. The intense seasonal changes of the higher latitudes with a fluctuation from about 18 h of daylight in summer to 8 h in winter are not observed in lower latitudes where days are neither very long in summer nor very short in winter. Dysphoric and euphoric mood states are more closely associated with areas where weather is more fluctuant in terms of both light and temperature.

As the prevalence of SAD appears to vary in direct proportion to latitude in temperate areas (Potkin et al. 1986; Rosen et al. 1990), it should be at its highest in Arctic areas. While some studies have confirmed this hypothesis (Lingjaerde et al. 1986; Booker and Hellekson 1992), some others, from north of the Arctic circle, have produced contradictory results (Hansen et al. 1991; Magnusson and Stefansson 1993; Partonen et al. 1993). These studies report considerably fewer problems in mood and behaviour during winter than those reported in temperate areas (Kasper et al. 1989; Terman et al. 1989). The Arctic researchers have suggested that the people of high latitudes might be genetically adapted to winter darkness, and a consequence of that would be a relatively low prevalence of SAD. The evidence of SAD running in families (Rosenthal et al. 1984; Wirz-Justice et al. 1986; Hellekson 1989; Madden et al. 1992) also supports the involvement of heredity factors in the seasonality of mood fluctuations.

A person's seasonality may be to some degree inherent; it also depends on where that person lives (Rosenthal 1993). To date, only two studies have attempted to investigate seasonal fluctuations in affect in populations non-indigenous to the area of the study. Magnusson and Axelsson (1993) have found a lower prevalence rate of winter SAD in Icelandic immigrants to Canada than that noted at different latitudes in the United States (Rosen et al. 1990). At the same time, Icelandic immigrants exhibited a lower prevalence rate than that of Icelandic inhabitants (Magnusson and Stefansson 1993). These findings support the latitude hypothesis in genetically similar populations. In a more recent study, Murase et al. (1995) have reported that people of tropical origin, if they migrate to higher latitudes, exhibit a winter pattern of seasonality similar to that reported by the native population (Haggag et al. 1990). It seems likely that seasonal changes in mood will be effected by the interaction of geographical location and genetic predispositions.

The present study was conducted, in fact, to test the relative importance of latitude versus a genetic predisposition for SAD. However, the methodology of the present research was different from the two studies cited above. These studies did not include native populations in their samples, instead the findings were compared to data from studies previously carried out in similar latitudes. The present study was conducted on age- and sex-matched indigenous white and non-indigenous Asian populations. We hypothesised that the climate of England (latitude 50°–55°N) would be more depressing in winter for a non-indigenous population coming from tropical regions. Apart from cultural shocks and adjustment problems, people coming from tropical areas might not be adapted either genetically or psychologically to the lighting conditions that prevail in temperate regions during the winter. Empirical data have shown that dark-skinned people with thick layers of melanin require a much larger dose of ultraviolet radiation than Caucasians to produce as much vitamin D (Clemens et al. 1982). This may be one of the possible explanations of the re-emergence of rickets among black infants in cities of the northeastern United States (Rudolf et al. 1980). Moreover, basal metabolism (Sasaki 1987) and the thermoregulatory system (Nagata et al. 1976) have been shown to vary according to the area of residence.

To elucidate the relative effect of genetic predispositions and geographical latitude, the Asian sample was divided into: (a) Asian-British who were born in England and (b) Asians who lived in England at the time of the study but who had lived more of their lives in their country of origin. Since seasonality of mood also depends on short-term and long-term adaptiveness, we assumed that the Asian-British might have developed some tolerance after living in England for many years. It may be that the Asian group, having neither genetic tolerance nor sufficient exposure to temperate zone winters, might be more susceptible to winter depression both psychologically and genetically. The Asian-British group was, in this sense, a control for the possible genetic influence on seasonality. It was decided to measure seasonality of the affective state only in women as previous research (Rosenthal et al. 1984; Kasper et al. 1989; Terman et al. 1989) has indicated the greater vulnerability of women to seasonal influences on affect.

The present study not only differed from previous population (i.e. non-clinical) studies in using unbiased screening instruments for depression not designed to measure seasonality specifically, but also improved on the methodology of the previous studies (Kasper et al. 1989; Terman et al. 1989; Booker and Hellekson 1992), which have relied on a retrospective self-estimation of mood fluctuations with the changing seasons. Such studies have been criticised by providing no independent baseline assessment of depressed mood (Palinkas et al. 1995) and also by being susceptible to failures of memory and depressive cognitive bias (Bromet et al. 1986; Young et al. 1991).