Seasonality of birth in seasonal affective disorder

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**Background:** Seasonal affective disorder (SAD) is defined as a form of recurrent depressive or bipolar affective disorder characterized by recurrent affective episodes, that occur annually at the same time of the year (Rosenthal et al., 1984). Season of birth is a putative etiological factor for several psychiatric illnesses. An excess of late winter and early spring births has been demonstrated repeatedly for schizophrenia, which has been hypothesized as the result of a prenatal infection adversely affecting the maturation of critical brain structural and functional components (Brown and Susser, 2002).

The aim of this investigation was to examine seasonal differences in the frequency of birth in a clinical sample of SAD patients.

**Methods:** 578 outpatients (446 females, 132 males) suffering from SAD, winter type, according to the DSM-IV, who had visited the outpatient-clinic for seasonal affective disorder at the Department of General Psychiatry (University of Vienna, Austria) between 1994 and 2003, were included in this evaluation. We compared the observed number of births in our sample with expected values calculated from a representative sample of 649,842 births between 1951 and 1991 in Vienna.
Statistical analysis was performed with the Chi-Square test (two-tailed) on the p=0.050 level of significance.

**Results:** The analysis of our data indicates that there was a significant deviation of the observed number of births from the expected values calculated on a monthly basis ($\chi^2=23.127$, df=11, p=0.017). Furthermore when comparing quarters (periods of 3 months: Jan-Mar, Apr-Jun, Jul-Sep, Oct-Dec) we found less births than expected in the first quarter of the year and a slight excess of births in the second and third quarter ($\chi^2=8.416$, df=3, p=0.038). There were also more births in the spring-summer season (calculated from Apr to Sep) and less than expected in fall and winter (Oct to Mar; $\chi^2=4.872$, df=1, p=0.027). Interestingly, patients, who had been diagnosed as suffering from melancholic depression (n=73; feature specifier according to DSM-IV) exhibited a different pattern of birth than patients with atypical depression (n=385): melancholic patients had significantly higher birth rates in the first quarter and lower rates in the third quarter ($\chi^2=9.849$, df=3, p=0.020). Also melancholic patients were more frequently born in fall/winter and less often in spring/summer compared to patients with atypical depression ($\chi^2=5.959$, df=1, p=0.015).

**Conclusions:** Beside genetic factors, that have been discussed in the pathogenesis of SAD, also environmental factors such as seasonality of birth seem to be of etiological significance. Possibly environmental light shortly after birth (as it has been discussed in schizophrenia by McGrath et al., 2002) has a formative influence on the individual vulnerability for the development of seasonal depression in later life. In addition birth effects seem to be dependent on the symptom profile of the patients,
but further studies are needed to elucidate the underlying mechanisms of these observations.

REFERENCES

