Season of Birth in Multiple Sclerosis in Sweden: Replication of Denmark Findings

Margaretah Wiberg, M.A. and Donald I. Templer, Ph.D.[1]

Abstract

The present findings of seasonality of birth in multiple sclerosis patients in Sweden meshes with a previous study of seasonality of birth in Denmark so as to indicate that multiple sclerosis patients tend to have been born in the spring and early summer.

Key Words

Multiple Sclerosis, Birth Month, Geographical, Sweden.

The purpose of the present study was to replicate with Swedish data the findings of a previous study[1] that found a seasonality of birth pattern if Danish multiple sclerosis patients that differed from that of general population of Danish persons. The purpose of that previous study was to determine if the seasonality of birth in multiple sclerosis patients resembled that of schizophrenic patients. The possibility of seasonality of birth in multiple sclerosis patients had not been investigated. Considerable research, however, has established that schizophrenics tend to be born in the winter and early spring months of the year.[2]

Templer et al[1] hypothesized a similar seasonality of birth distribution because of the similar geographical prevalence and incidence distribution of the two disorders[3-6] and because of the other similarities such as both being chronic disorders that begin in early adult life and run an irregular course, both being more common in the colder parts of the world, and both having possible viral etiology. Templer et al[1] did not find a significant relationship between multiple sclerosis birth pattern deviation from the general population birth pattern and schizophrenia birth pattern deviation from general population birth pattern in Denmark. However, they did find a very clear pattern consisting of an excess of multiple sclerosis births in the four consecutive months of March, April, May and June, and a deficit in the other 8 months of the year.

1. California School of Professional Psychology - Fresno, 1350 M Street, Fresno, CA 93721-1881.

Method

The month and year distribution of Swedish multiple sclerosis patient births from 1900 to 1964 was obtained from *Socialstyrelsens in Stockholm, Sweden.* The month and year distribution of the 32,754 Swedish schizophrenic births from 1900 to 1964 was obtained from *Socialstyrelsens Slutenvdrds Register.* The month and year distribution of the Swedish general population births from 1900 to 1964 was obtained from *Statistiska Central Byran, Orebro, Sweden.*

Results

Table 1 displays the number of births of Swedish multiple sclerosis patients, number expected on basis of general population births, number of births of Swedish patients, number expected on the basis of general population births (X^2=30.41,df=11, p<.01). The planned dichotomy on the basis of the Denmark study was carried out with March, April, May and June compared with the other 8 months (X^2=4.40, df=1, p.<.05). Although the analysis could be viewed as replicating the findings of the early study with Denmark data, the results were not identical. In the Denmark study there were large excesses of MS births in the 4 consecutive months of March, April, May and June; and there were fewer than expected births in the other 8 months. With the present Swedish data the largest excesses were in March, May and July. It was decided to combine the Denmark and Swedish data as appears in Table 2. It is apparent from Table 2 that in the 5 consecutive months of March, April, May, June and July, there are excess MS births and deficits in the other 7 months (X^2=30.80, df=l, p<.001).

Although the distribution of schizophrenic births was not a major focus in the present study as was the case with the Denmark study, the number of Swedish multiple sclerosis patients and the number of expected on the basis of general

Table 1. Number of Births Each Month for Multiple Sclerosis, Schizophrenic and General Population for Swedish Persons.

	Multiple Sclerosis		Schizophrenics		
Month	**Observed**	**Expected**	**Observed**	**Expected**	**General Population**
January	496	546.66	2808	2800.28	653,766
February	510	503.60	2626	2580.13	602,261
March	622	588.26	3182	3013.90	703,514
April	565	569.97	2967	2920.17	681,635
May	628	561.74	2887	2878.01	671,793
June	513	527.97	2693	2705.00	631,408
July	576	530.10	2757	2715.91	633,953
August	516	514.48	2568	2635.91	615,281
September	511	538.48	2588	2758.86	643,984
October	541	511.47	2557	2620.48	611,680
November	461	486.19	2461	2490.94	558,442
December	454	514.09	2666	2698.08	614,887

Table 2. Number of Births Each Month for Multiple Sclerosis and General Populations. Danish and Swedish Persons Combined.

	Multiple Sclerosis	
Month	**Observed**	**Expected**
January	985	1068.41
February	998	1013.75
March	1245	1170.15
April	1235	1128.90
May	1244	1120.14
June	1083	1045.26
July	1076	1051.23
August	1029	1033.94
September	1004	1050.51
October	992	1009.70
November	894	964.35
December	931	892.38

population births are presented in Table 3 (X^2=26.61, df=l p<.01). The unusual excess of schizophrenia in reported in the literature in the winter and early spring months is also apparent in the present study with Swedish data. The rank and order correlation coefficient between Swedish schizophrenic birth deviation from general population birth distribution and multiple sclerosis birth deviation from general population births of .33 was in the direction hypothesized in the Denmark study but was not significant.

Discussion

The composite perspective provided by the season of birth Denmark and Sweden data shows that persons with multiple sclerosis, or at least those in Scandinavia, tend to be born in the spring and early summer months. The evidence that there is a seasonality of both in persons who later develop multiple sclerosis is now rather strong. The reasons for this phenomenon, however, are definitely not clear. Various etiology formulations for multiple sclerosis regarding infection, nutrition, immune factors, and biological and/or other stresses could be viewed as compatible with the seasonality findings. It should be noted that Livingston, Adam and Bracha found that a significantly disproportionate number of American children with dyslexia were born in May, June, and July. These authors suggested that their findings could be attributed to viral infection, especially influenza, during the second trimester of pregnancy.[7]

Possibly relevant is the literature showing that symptoms exacerbations in multiple sclerosis patients are more common in the summer months.[8-11] And, in a study in Ireland it was found that the duration of exacerbations were longer in the summer months.[12] In that study high correlations between climatic factors an duration of exacerbations were found -.66 with mean total rainfall, -.55 mean relative humidity, .83 mean temperature, .85 maximum temperature, -.78 absolute minimum temperature, .79 mean sunshine, and .83 mean solar radiation. Perhaps the same factors that lead to exacerbations have etiological importance in the general proximity of the time of birth or early infancy. It is noteworthy that although multiple sclerosis births and exacerbations occur in the warmer months, the disorder is much more common in colder climates. In fact, the correlations of geographical prevalence rates of multiple sclerosis and climate conditions provided by Templer, Hughey, Chalgujian, Lavoie, Trent, Sahwell, and Spencer[6] were the opposite of the correlations between exacerbation rates and climate variables stated above. Templer et al[6] stated, "Perhaps the most omnibus generalization permitted by the present findings is that schizophrenia and multiple sclerosis both seem to be associated with geographical variables that at least folklore has traditionally regarded as unhealthy. The 'unhealthy' variables associated with high multiple sclerosis rates and/or schizophrenia rates include colder temperature, closer to the hemispheric poles, more precipitation, low elevation and less sunlight. Infection and nutrition are two of the possible etiological variables that could account for this pattern." Perhaps people who have origins in cold climates have a genetic predisposition to react less favorable to warm weather. Not only Africans, but African-Americans have a low rate of multiple sclerosis. Washington and Minnesota, states that are not only bordering Canada, but have very high Scandinavian-American populations, have the second and third highest rates respectively of multiple sclerosis of the 50 U.S. states.[13]

References

1. Templer DI, Trent NH, Spencer DA, Trent A, Corgiat MD, Mortensen PB, Gorton M. Season of birth in multiple sclerosis in Sweden: Replication of Denmark findings: *Acta Neurol Scand* 1992: 85: 107-109.
2. Torrey, EF. *Schizophrenics and civilization.* New York: Aronson, 1980.
3. Templer, DI, Reiger, MW, Corgiat, MD. Similar distribution of schizophrenia and multiple sclerosis: *J OrthomolPsychiatry* 1978: 7:231-235.
4. Templer, DI, Cappelletty, GG, Kauffman, I. Schizophrenia and multiple sclerosis distribution in Italy. By *J Psychiatry* 1988: 153: 389-390.
5. Templer, DI, Cappelletty, GG, Kauffman, I. Schizophrenia and multiple sclerosis: a state to continent perspective. *J Orthomol Med* 1989: 4: 8-10.
6. Templer DI, Hughey B, Chalgujian H, Lavoie M, Trent NH, Sahwell P, Spencer DA. Multiple sclerosis, schizophrenia, and latitude. *J Orthomol Med* 1990: 5:125-128.
7. Livingston R, Adam BS, Bracha HS. Season of birth and neurodevelopmental disorders: Summer birth is associated with dyslexia. *J of*

the Am Academy of Child and Adolescent Psychiatry. 1993: 32, 612-616.

8. Prineas JW. The etiology of multiple sclerosis. In: Vinken JP, Bruyn, GW, eds. *MS and Other Demyelinating Diseases.* Amsterdam, the Netherlands: North-Holland Publishing Co; 1970:118-120.
9. Sibley, WA, Foley, JM. Seasonal variation in multiple sclerosis and retrobulbar neuritis in northeastern Ohio. *Trans Am Neurol Assoc.* 1965: 90: 295-297.
10. Wuthrich R, Rieder, HP. The seasonal incidence of multiple sclerosis in Switzerland. *Eur Neuor.* 1970: 3:257-264.
11. Goodkin DE, Hertsgaard D. Seasonal variation of multiple sclerosis exacerbations in North Dakota. *Arch. Neuro.* 1989: 46:1015-1018.
12. O'Reilly, MAR, O'Reilly, PMR. Temporal influences on relapses of multiple sclerosis. *Eur Neuor.* 1991:31:391-395.
13. Kurtze JF. Some epidemiological trends in multiple sclerosis. *TINS:* 75-80.