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Seasonality in the presentation of acute lymphoid leukaemia

Sir

A recent report by Badrinath et al (1997) observed a seasonal distribution in the diagnosis of cases of acute lymphocytic leukaemia as recorded by the East Anglian Cancer Registry in the period 1971–94. This took the form of a 40% excess of cases diagnosed in the summer months (May–October), and was seen in children (aged 0–14 years, summer–winter cases 158:113) and adults (aged 15+ years, 142:102). Shown below are observations obtained from a much larger dataset of both childhood leukaemias and solid cancers, namely the Oxford Survey of Childhood Cancers (OSCC), a national case–control study of childhood cancer (Stewart et al, 1958; Knox et al, 1987), as well as data on acute lymphoblastic leukaemia registrations from the West Midlands region.

Table 1 shows the monthly pattern of onsets, divided into summer (May–October) and winter (November–April) for all childhood leukaemias and childhood lymphatic leukaemias in the period 1953–81. (Onset date is the date when the survey child was last perfectly well, obtained from the mother's description of the fatal disease and any preceding illnesses.) For neither of the diagnostic groups was there a 40% summer–winter excess of onsets, although a significant ratio of 1.05 was found for all childhood leukaemias. The summer–winter ratio was even less marked for date of diagnosis: all leukaemias 1.03 (0.99–1.07); lymphatic leukaemias 1.02 (0.97–1.08). In addition, these data did not show a more prominent summer excess of lymphatic leukaemia among children less than 6 years of age (ratio 1.03, 95% confidence interval 0.97–1.10, date of diagnosis), as was reported by Badrinath et al (1997).

Table 1 also shows data from the West Midlands Cancer Intelligence Unit on acute lymphoblastic leukaemia registrations

Table 1 Monthly distribution of presentation of lymphoid leukaemias

	Onsets in children who died from cancer aged 0–15 years, Great Britain, 1953–81		Registrations, West Midlands residents 1971–94	
	All leukaemias	Lymphatic leukaemias only	Acute lymphoblastic leukaemia	
Month	Children (0–15 years)		Children (0–14 years)	Adults (15 + years)
May	775	449	65	47
June	820	495	71	62
July	808	425	78	48
August	757	444	74	45
September	756	425	75	48
October	794	481	69	42
Summer total	4710	2719	432	292
November	657	383	63	47
December	894	527	59	33
January	783	440	84	45
February	673	393	64	30
March	756	433	48	31
April	734	417	55	57
Winter total	4497	2593	373	243
Summer–Winter ratio	1.05	1.05	1.16	1.20
95% confidence limits	1.01, 1.09	1.00, 1.10	1.02, 1.30	1.03, 1.37

in the period 1971–94. These data showed a 16% excess of cases diagnosed in the summer months (May–October) in children (95% confidence interval 1.02–1.30), and a 20% excess in adults (95% confidence interval 1.03–1.37).

Using the same fairly crude technique as Badrinath et al (1997) on two datasets (which covered slightly different age and diagnostic groups and were collected over different time periods) has produced mixed results. We found little evidence of seasonality in a national dataset, but have found seasonality (albeit less marked than in East Anglian data) in a regional dataset. Badrinath et al (1997) noted that it may be difficult to demonstrate a seasonality effect in a heterogeneous national population, unless account is taken of geographical heterogeneity. To investigate this issue further, we suggest that future work on seasonality needs more sophisticated analyses, controlling for broad geographical heterogeneity. If data are to be examined over very long periods, the influence of long-term temporal trends should be removed, or false-positive patterns of seasonality may be produced.

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Seasonality in the diagnosis of childhood acute lymphoblastic leukaemia

Sir

We read, with interest, of the significantly higher incidence of acute lymphoblastic leukaemia (ALL) in summer months compared with winter months for both adults and children in East Anglia reported by Badrinath et al (1997). Their summer (May–October) to winter (November–April) ratio of 1.40 (quoted 95% confidence limit 1.16–1.64) for numbers of cases of childhood ALL should again stimulate consideration of the seasonality of that disease. We have maintained a registry of all childhood cancers in the south-west of England, which has been used to investigate the incidence of childhood cancer in the five counties of Avon, Cornwall, Devon, Gloucestershire and Somerset. Repeating the analysis for seasonality in this area for children aged 0–14 years diagnosed with ALL in the 20-year period 1976–95, we found no excess of cases in the six summer months compared with the six winter months for south-west England as a whole (Table 1). Somerset was the only county with a high summer to winter ratio, but the low number of cases in this small county make the result of no statistical significance. The Somerset ratio would seem to be the result of a lower than expected number of winter cases rather than a high number of summer cases when compared with published national incidence rates.

Our results for south-west England suggest that the high excess summer–winter ratio in East Anglia might be due to chance or be, in some way, related to the nature of the area. Devon and Cornwall is an area in which there is a large influx of holiday makers in the summer months, and Avon is an area of high population density. Our results cast doubt on the generality of the East Anglia finding in the case of children, but the importance of a possible variation linked to seasonal viral infections is such that further studies on a national basis are called for.

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Table 1 Seasonal distribution of the onset (summer–winter[a] ratios) of childhood[b] acute lymphoblastic leukaemia in the five counties of south-west England 1976–95, with 95% confidence intervals

Area	Number of cases summer–winter	Ratio summer–winter (95% confidence interval)
Avon	57:55	1.04 (0.71–1.51)
Cornwall	26:32	0.81 (0.46–1.41)
Devon	61:58	1.05 (0.73–1.51)
Gloucestershire	36:46	0.78 (0.49–1.24)
Somerset	29:20	1.45 (0.79–2.70)
Total South-West	209:211	0.99 (0.82–1.20)

[a]Summer, May–October; winter, November–April. [b]Ages 0–14 years.