The incidence of giant cell arteritis in Jerusalem over a 25-year period: annual and seasonal fluctuations

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Received on February 20, 2006; accepted in revised form on July 27, 2006.

Clin Exp Rheumatol 2007; 25 (Suppl. 44): S15-S17.

Key words: Giant cell arteritis, temporal arteritis, epidemiology.

ABSTRACT

Objective. *Giant-cell arteritis (GCA) incidence is reported to be rising. A cyclic pattern of annual incidence rates and seasonal variations were reported by several groups. However, such fluctuations were not observed by others. We examined both annual and seasonal rates of GCA over a period of 25 years in Jerusalem*

Methods. *Charts of all patients diagnosed as GCA between 1980-2004 were reviewed. In 170 cases GCA was biopsy-proven. Thirty-six additional cases were included as they met the American College of Rheumatology GCA classification criteria. Data on the Jerusalem population throughout the study period was collected from the annual publications of the Israel Bureau of Statistics. Age- and sex-specific incidence rates per 100000 population aged ≥ 50 were calculated.*

Results. *For the whole period, the average age-adjusted incidence rate was 11.3 per 100000, and 9.5 for the biopsy-positive cases. The female: male ratio was 1.4:1. Cyclic fluctuations of GCA incidence with 3 distinctive peaks, 8-10 years apart, were observed. Altogether, there was no apparent increase in GCA incidence during this period. Seasonal variations were observed: in 192 patients we were able to estimate the time of onset of GCA symptoms. It showed a peak in the months of May and June, with the number of patients being twice as expected for this period ($p < 0.001$).*

Conclusion. *GCA onset was more common in late spring and early summer, and fluctuations in GCA annual incidence with 3 distinctive peaks were observed during a 25-year period. These suggest infectious or other environmental etiology, however thus far no such agents were proven.*

Introduction

GCA occurs more commonly among people of North European decent, while rates are lower in Mediterranean countries (1-9). GCA incidence is reported to be rising (6, 8, 9). In addition, a cyclic pattern of annual incidence rates and seasonal variations were reported by several groups (4, 6, 9, 10), suggestive of an environmental-infectious etiology (11), but such fluctuations were not observed by others (8).

We conducted an extension of a previously reported short-term epidemiological study on GCA in the Jewish population of Jerusalem (4). We examined both annual and seasonal rates of GCA over a period of 25 years, looking for specific patterns of GCA incidence.

Patients and methods

Charts of all patients diagnosed as GCA in the four general hospitals in Jerusalem between 1980-2004 (inclusive) were reviewed. It included all cases that showed a medical diagnosis of GCA or a surgical index entry of temporal artery biopsy. In 170 of the patients the diagnosis was biopsy-proven. In 40 biopsy-negative cases diagnosed as GCA, 2 rheumatologists (GN, GSB) reviewed the medical information and

Table I. Rates of GCA in the Jewish population of Jerusalem during the period 1980-2004. Rates are per 100000 population at age ≥ 50, or according to the appropriate age group.

	Rate	95% CI
All patients	11.3	9.5-13.1
Females	13.1	10.9-15.3
Males	9.1	6.8-11.4
Age 50-64	3.0	2.0-4.0
Age 65-74	13.7	10.1-17.3
Age ≥ 75	28.6	23.4-33.8
Biopsy-positive GCA	9.5	6.4-12.6

reached consensus on the diagnosis: 36 of these biopsy-negative cases were included as they met the 1990 American College of Rheumatology (ACR) criteria for GCA classification (12) and had good response to steroid therapy.

Data on the Jerusalem population throughout the study period was collected from the annual publications of the Israel Bureau of Statistics. Age- and sex-specific incidence rates per 100000 population aged ≥ 50 were calculated using the number of incident cases as the numerator and population estimates based on census counts as the denominator. Linear interpolation was used to estimate population size for intercensal years. Analysis was performed by descriptive statistics, and further by chi-square analysis of contingency tables for the categorical variables. Ninety-five percent confidence intervals (95% CI) were computed for incidence rates.

Results

During the 25 years of the study, the Jerusalem Jewish population aged ≥ 50 years grew steadily from 52,000 to 99,900. During that period of time 206 patients were diagnosed as having GCA, 82% were biopsy-positive. For the whole 25-year period, the average age-adjusted incidence rate for all patients was 11.3 per 100,000 population aged 50 and above, and 9.5 for the biopsy-positive cases (Table I). The incidence rates increased with age, and the female:male ratio was 1.4:1.

We observed cyclic fluctuations of age-adjusted GCA incidence with 3 distinctive peaks, 8-10 years apart (Fig. 1). Reviewing data of the Health Ministry, we could not find any infectious disease outbreaks during those 3 peak periods. Altogether, there was no apparent increase in the annual incidence rates of GCA during the 25-year period.

Seasonal variations were observed (Fig. 2), with more cases of GCA diagnosed in the summer (32%), and lower incidence rates in the autumn (25%), winter (22%), and spring (21%). However, these observed differences were not statistically significant when compared to the expected rates of 25% in one season. In 192 patients' charts, we had information on the subjective duration of symptoms prior to GCA diagnosis. Accordingly, we were able to calculate the approximate time of the onset of GCA symptoms (Fig. 3). It shows a peak in the months of May and June, with the number of patients being twice as expected for this period ($p < 0.001$).

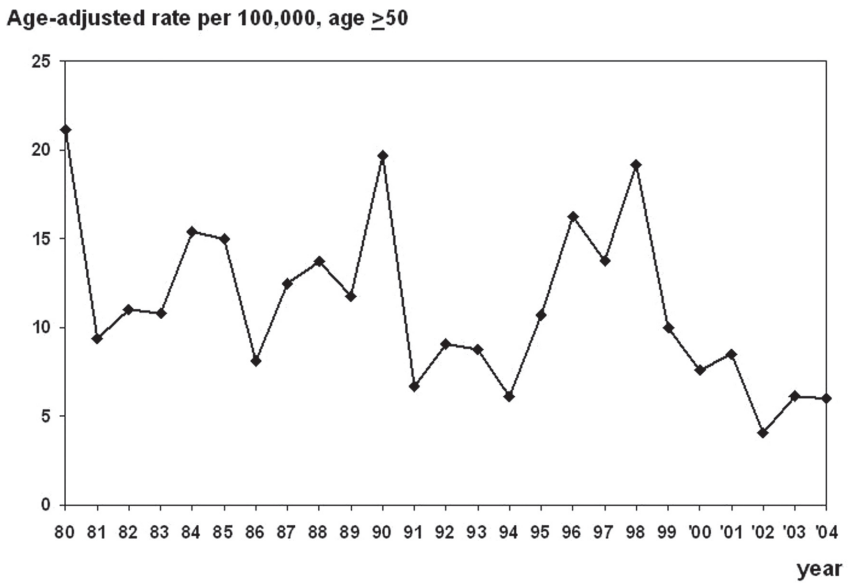

Fig. 1. Annual age-adjusted incidence rates throughout a period of 25 years in Jerusalem.

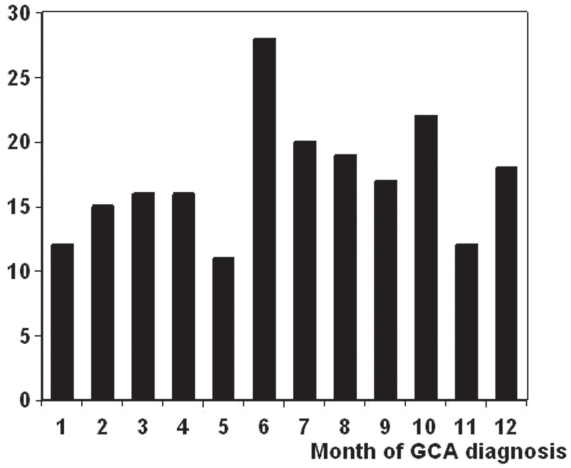

Fig. 2. Monthly variation of the number of GCA patients at the time of diagnosis.

Discussion

The incidence rate of GCA in this study is comparable to those found in other Mediterranean countries (2, 8, 13). The relatively low female:male ratio is also comparable to those reported in studies from Mediterranean countries, which is lower from the 3:1 ratio reported in north European populations (1-3, 6-8). The incidence of GCA increases with age. This age-specific increase in incidence rates found in our population is comparable to that reported in another study, where the incidence rates per 100,000 increased from 2 in the age group 50–59 years, to 52 in the age group 80 and older (9).

In contrast to other reports (6, 8), we did not find an increase in GCA incidence throughout the 25-year period, between 1980-2004. In those reports, the increasing incidence occurred during the periods of 1976-95 and 1981-98, respectively. However, in another study, a 50-year observation period in the population of Olmsted County, Minnesota, the incidence rate increased from 1950 to 1979, but has been stable since then (9). We have no data on the GCA incidence in Jerusalem prior to 1980, but there is an indication that

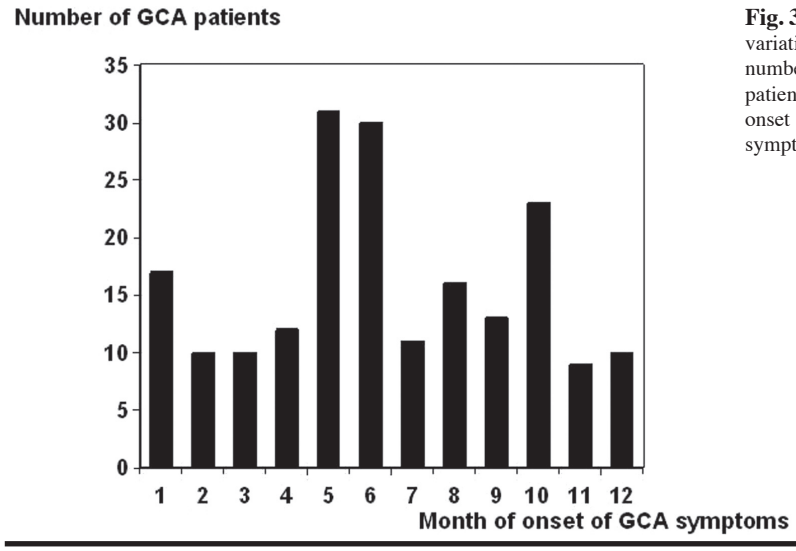

Fig. 3. Monthly variation of the number of GCA patients at the onset of disease symptoms.

the incidence in Israel was significantly lower prior to 1980 (14). These findings may not reflect true changes in the disease incidence, but rather increasing awareness of GCA among clinicians in Jerusalem after 1980. The awareness of GCA probably became adequate and stable throughout the last 25 years.

Fluctuations in GCA incidence with distinctive peaks, similar to those found in our study, were reported by several groups, although others did not find such fluctuations (6, 8-10). In the study from Minnesota (9), peaks occurred every 7-10 years, while in the Danish study there were 5 peaks over a period of 13 years (10). The reason for these fluctuations is not clear. The Danish study reported close association between those peaks and epidemics of Mycoplasma pneumoniae, Chlamydia pneumoniae, and parvovirus B19. In our study, we could not find any evidence for such infectious disease outbreaks. The seasonality effect, with onset of symptoms peaking in late spring and early summer is also suggestive of an environmental factor, but such a factor could not be proven. Petrusdottir *et al*. reported that of all seasons, the lowest incidence of positive temporal biopsies was in the summer months (6), however Cimmino *et al*. reported that polymyalgia rheumatica was diagnosed in 62% of their patients during the months of May-August, approximately twice as the expected rate for this period (15). Most recently, Smeeth et al. reported seasonal variations of GCA and PMR in the United Kingdom, with higher rates of diagnosis during late spring and early summer (16). Other epidemiological studies did not find any seasonal effect on the onset of GCA (8, 17, 18).

In summary, we observed fluctuations in the annual incidence rates of GCA with distinct peaks 8-10 years apart. In addition, GCA onset was more common in late spring and early summer. These suggest an infectious or other environmental etiology, however thus far no such agents were proven.

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