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• *CLINICAL RESEARCH* •

Incidence of ulcerative colitis in Central Greece: A prospective study

Spiros D. Ladas, Elias Mallas, Konstantinos Giorgiotis, Georgios Karamanolis, Dimitrios Trigonis, Apostolos Markadas, Vana Sipsa, Sotirios A. Raptis

Spiros D. Ladas, Sotirios A. Raptis, Dimitrios Trigonis, Apostolos Markadas, Gastroenterology Unit, 2nd Department of Internal Medicine, Athens University, Attikon University General Hospital, Athens, Greece
Elias Mallas, Georgios Karamanolis, Gastroenterology Unit, 2nd Department of Surgery, Athens University, Aretaieion Hospital, Athens, Greece
Konstantinos Giorgiotis, Dimitrios Trigonis, Apostolos Markadas, The Trikala Cooperative IBD Group, Trikala, Greece
Vana Sipsa, Biostatistic Laboratory, Department of Epidemiology, Athens University, Athens, Greece
Correspondence to: Professor Spiros D. Ladas, 23 Sisini Street, 11528 Athens, Greece. sdladas@hol.gr
Telephone: +30-210-7210213 Fax: +30-210-5326422
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Abstract

AIM: To study the incidence of ulcerative colitis UC in the prefecture of Trikala, Central Greece.

METHODS: A prospective and population based epidemiological study of UC from 1990 to the end of 1994 was conducted. Trikala is a semirural prefecture of Central Greece with a population of 138 946 (census 1991). Three gastroenterologists (one hospital based, two private doctors) of the prefecture participated in this study.

RESULTS: During the study period, 66 new histologically verified cases of UC were recorded. The mean annual incidence of the disease in 1990-1994 was 11.2 per 10^5 inhabitants (95%CI: 8.7-14.3). There was no difference between men and women (annual incidence: 10.5 and 12.0 per 10^5 inhabitants respectively), either among urban, semirural or rural populations (annual incidence: 11.7, 17.1 and 9.9 per 10^5 inhabitants respectively). The majority (56%) of the patients never smoked and a quarter were ex-smokers. About a half of all cases had proctitis.

CONCLUSION: UC is common in Central Greece and its incidence is similar to that in North-Western European countries.

Key words: Ulcerative colitis; Histology

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INTRODUCTION

Ulcerative colitis (UC) is a chronic inflammatory disease of unknown etiology. During recent years, many epidemiological studies have shown that the incidence of UC varies within different geographic areas. Northern developed countries in Europe, especially United Kingdom and Scandinavia, have a higher rate than in southern countries[1-3]. This geographic variation suggests the hypothesis that some environmental factor(s) and life style may be responsible for the etiology of the disease[3]. Two epidemiological studies showed a different incidence of UC in Greece[4,5].

The aim of our study was to obtain an estimation of the incidence of the disease in Central Greece and to compare our data with those of other parts of Greece and other European countries. The present prospective epidemiological study concerned the prefecture of Trikala, a semirural area of Central Greece.

MATERIALS AND METHODS

Study population and area

Trikala is one of the four prefectures of Thessalia county, which is a semirural area of Central Greece. The total population, according to the 1991 census (National Statistic Organisation) is 138 946 residents, but the study population was 117 395, as UC is uncommon before the age of 10 years[6]. The study population was stable and racially homogenous and had a wide range of age, social status, occupation and level of education. Table 1 shows the age distribution of study population by sex according to the 1991 census.

Table 1 Age distribution of the study population of Trikala prefecture by sex according to 1991 census

Age (yr) group	Males	Females	Total
10-19	11 036	9 938	20 974
20-29	7 997	7 930	15 927
30-39	9 097	8 521	17 618
40-49	9 141	8 375	17 516
50-59	9 896	10 030	19 926
60-69	7 477	8 259	15 736
>70	4 289	5 409	9 698
Total	58 933	58 462	117 395

Table 2 Population distribution in Trikala area

	Males	Females	Total
Urban	20 378	20 700	41 078
Semi-rural	5 776	5 944	11 720
Rural	32 779	31 818	64 597

Table 3 Incidence of UC among residents of the perfecture of Trikala by sex and the year of diagnosis (95%CI shown in brackets). Age-standardized incidence (ASI) and 95%CI were shown for total incidence over five years

Year	Males		Females		Total	
	n	Incidence per 10^5	*n*	Incidence per 10^5	*n*	Incidence per 10^5
1990	3	5.1 (1.1-14.9)	3	5.1 (1.1-15.0)		5.1 (1.9-11.1)
1991	5	8.5 (2.8-19.8)	5	8.6 (2.8-20.0)	6	8.5 (4.1-15.7)
1992	8	13.6 (5.9-26.8)	8	13.7 (5.9-27.0)	10	13.6 (7.8-22.1)
1993	4	6.8 (1.9-17.4)	9	15.4 (7.0-29.2)	16	11.1 (5.9-18.9)
1994	11	18.7 (9.3-33.4)	10	17.1 (8.2-31.5)	13	17.9 (11.1-27.3)
1990-4	31	10.5 (7.2-14.9)	35	12.0 (8.3-16.7)	21	11.2 (8.7-14.3)
ASI		9.3 (4.2-17.1)		11.4 (5.6-19.8)	66	10.2 (5.0-18.6)

Table 4 Average annual incidence (1990-1994) of UC among residents of the prefecture of Trikala by sex and age

Age (yr) groups	Males		Females		Total	
	n	Incidence per 10^5	*n*	Incidence per 10^5	*n*	Incidence per 10^5
10-19	6	10.9 (4.0-23.7)	2	4.0 (0.5-14.5)	8	7.6 (3.3-15.0)
20-29	8	20.0 (8.6-39.4)	7	17.7 (7.1-36.4)	15	18.8 (10.5-31.1)
30-39	8	17.6 (7.6-34.7)	12	28.2 (14.6-49.2)	20	22.7 (13.9-35.1)
40-49	3	6.6 (1.4-19.2)	10	23.9 (11.5-43.9)	13	14.8 (7.9-25.4)
50-59	1	2.0 (0.05-11.3)	3	6.0 (1.2-17.5)	4	4.0 (1.1-10.3)
60-69	4	10.7 (2.9-27.4)	0	0	4	5.1 (1.4-13.0)
>70	1	4.7 (0.1-26.0)	1	3.7 (0.09-20.6)	2	4.1 (0.5-14.9)
Total	31		35		66	

Table 5 Average incidence (1990-1994) of UC among residents of the prefecture of Trikala by sex and place of residence

Place of residence	Males		Females		Total	
	n	Incidence per 10^5	*n*	Incidence per 10^5	*n*	Incidence per 10^5
Urban	7	6.9 (2.8-14.2)	17	16.4 (9.6-26.3)	24	11.7 (7.4-17.4)
Semi-rural	6	20.8 (7.6-45.2)	4	13.5 (3.7-34.5)	10	17.1 (8.2-31.4)
Rural	18	11.0 (6.5-17.4)	14	8.8 (4.8-14.8)	32	9.9 (6.8-14.0)
Total	31		35		66	

According to current epidemiologic guidelines, it could be argued that the size of the study population was small. However, as the population was homogenous, well balanced and dispersed over a small geographical area, the results could likely provide accurate baseline estimates of the incidence of UC for the study area.

The patients were separated according to their residence into three groups. The first group included residents of urban regions, the second of semi-rural and the last one of rural. Any patient who resided within cities with a population over 10 000 inhabitants was regarded as belonging to an urban population, in large villages (2 000-9 999 inhabitants) as a semirural population and in the country as a rural population (small villages, below 1 999 inhabitants). The population distribution is given in Table 2.

Case ascertainment

The health care system is of mixed type, including a National Health Service and a private sector. The National Health Service consists of three health centers and a General Hospital. There is only one gastroenterology department in the General Hospital, with one specialist. In the private sector there are no hospitals and two gastroenterologists working in the area. There is no established general health information system yet and hence no record linkage was possible. All three gastroenterologists of the prefecture participated in this study, which started on January 1 1990. Patients who had been residents in the defined study area at the time of diagnosis were included. The study group held regular meetings during the study period to review the data.

All patients included in the study underwent a complete laboratory examination including several stool examinations for parasites, stool cultures and appropriate serologic examinations for exclusion of gastrointestinal infections. Intestinal ischaemia, drug-induced enteritis and colitis, in addition to other known causes of intestinal inflammation were excluded as far as possible. All patients underwent a complete colonoscopic examination with biopsies from various parts of the large bowel. All histological findings were discussed by a panel of pathologists interested in inflammatory bowel diseases (IBD). Standard criteria were taken into account to establish the final diagnosis[7].

Statistical methods

Annual and average UC incidences were calculated as the total number of patients first diagnosed as having UC per 10^5 inhabitants in the study area. For the aggregated data (1990-1994), age-standardized incidences were calculated using standard European population. Ninety-five per cent confidence intervals (CI) were calculated using the exact binomial variance.

RESULTS

During the five-year period (1 January 1990-31 December 1994), 66 new cases of definite UC were seen in the area of Trikala (31 males, 35 females). Table 3 shows the incidence of UC by the year of diagnosis and sex. The mean annual incidence of UC over the five years was $11.2/10^5$ inhabitants per year (95%CI: 8.7-14.3). The annual incidence of $5.1/10^5$ in 1990 increased to $17.9/10^5$ in 1994. There were fluctuations in the incidence rates with the highest of $18.7/10^5$ in males in 1994 and the lowest of $5.1/10^5$ in men and women in 1990.

The male/female ratio was 1:0.9. The 95%CI in Table 3 showed the difference in incidence rates between males and females. Table 4 shows the age distribution at the time of diagnosis for all the patients as well as age specific incidence rates. The highest age specific incidence rate was $22.7/10^5$ inhabitants for patients between 30-39 years of age.

Looking at the incidence of UC by sex and place of residence (Table 5), the urban population had an incidence of $11.7/10^5$, the semi-rural $17.1/10^5$ and the rural $9.9/10^5$. The average annual incidence of females living in rural

area was the lowest ($8.8/10^5$) among women, whereas males living in urban area had the lowest average annual incidence among men ($6.9/10^5$).

In relation to smoking, 13 of the 66 patients (19.7%) smoked, 16 (24.3%) were ex-smokers and 37 (56%) non-smokers.

As far as family history of IBD was concerned, in 3 of the 66 patients (4.5%) either UC or Crohn's disease was present in a first degree relative.

In relation to clinical features, 5 patients (7.5%) had pancolitis, 29 (44%) proctosigmoiditis and 32 (48.5%) proctitis. During the follow up period, in 36 of the patients (54.5%) at least one relapse per year was observed. Hospitalization was required by 8 patients (12.1%) at different times after the day of diagnosis.

DISCUSSION

Epidemiological studies have found that the incidence of UC varies within geographic areas and within populations of different race.

According to our findings, a UC incidence of $11.2/10^5$ (95%CI: 8.7-14.3) was higher than that reported from other southern European countries[8,9] and within the range of findings in northern Europe[10-12]. In Greece, a retrospective study from north-west Greece [4] showed an incidence of $4.0/10^5$ (95%CI: 3.0-5.0) and a prospective study from Crete[5] showed an incidence of $8.9/10^5$ (95%CI: 7.2-10.4). The incidence of UC in Trikala prefecture showed an increase during the five years of the study, from $5.1/10^5$ in 1990 to $17.9/10^5$ in 1994. This increase may be attributed to informing programs about the disease, raising the likelihood of people being referred to specialists. Moreover, the application of modern investigative techniques in diagnostic evaluation is likely to explain the increase, although a true raise of the incidence can not be excluded.

The incidence regarding sex was slightly higher for females ($12.0/10^5$) compared to males ($10.5/10^5$). This finding was remarkable especially in the incidence of 1993, without a special reason to explain it. Another two Greek studies[4,5] did not show this difference. The age-specific incidences, either in males or in females, showed a peak in the age group of 30-39 years. This peak incidence has also been observed by others [4,5,13].

The incidence between urban and rural population was similar, whereas the incidence in semi-rural populations was slightly increased. The average incidence among women living in rural areas ($8.8/10^5$) was lower than that among women living in urban areas ($16.4/10^5$) and also lower than that among men living in rural areas ($11.0/10^5$). This finding has been reported in the study of Crete[5], but it is unclear if it shows true incidence differences or reflects difficulties in access to hospital care and the social shyness of women living in Greek villages.

Regarding smoking, our findings are similar to those reported by others[14,15]. UC was more common between non-smokers and ex-smokers compared with smokers.

According to the anatomical distribution of UC, pancolitis showed a slightly lower proportion compared with other studies[4,5,10,16], but the proportion for proctitis was similar.

Although epidemiological studies presented special problems, we believe that our results represent the true incidence of UC in the prefecture of Trikala. The population of Trikala is relatively stable and with only three specialists and one hospital, it was easy to carry out the study.

In conclusion, the incidence of UC in Central Greece is comparable to that reported from other European countries. The increasing incidence of UC during the five years of the study may be explained by the tendency in Greece to adopt a life-style similar to other European countries. This increase may suggest that environmental determinants, diets and life-styles are probably related to UC.

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