Computerized general practice databases provide quick and cost-effective information on the prevalence of angina pectoris

Alessandro Filippi, Diego Vanuzzo*, Angelo Antonio Bignamini**, Emiliano Sessa***, Ovidio Brignoli, Giampiero Mazzaglia***

*Italian College of General Practitioners, Florence, *Agenzia Regionale del Friuli-Venezia Giulia, Udine, **School of Pharmacy, University of Milan, Milan, ***Health Search, Italian College of General Practitioners, Florence, Italy*

Key words:
Angina pectoris; Clinical database; Costs; Nitrates; Outpatients.

Background. **The aim of this study was to compare the prevalence of angina pectoris (AP) using self-reported information and primary care databases.**

Methods. **A comparison between the prevalence of AP in 730 586 subjects from the Health Search Database (HSD) and 119 799 individuals from a Health Interview Survey (HIS) was performed. The age-specific prevalence was calculated by dividing the detected cases by the total number of individuals in each age group. The age-standardized prevalence was estimated by direct standardization performed using the Italian standard population.**

Results. **The HSD reported a higher crude prevalence of AP than the HIS, both in males (1374/100 000 vs 1006/100 000) and females (1449/100 000 vs 1007/100 000). In the HSD the age-specific prevalence was lower for patients aged < 65 years, whilst higher estimates were reported for older patients. Age standardization slightly reduced the prevalence in both samples, although the HSD always reported higher estimates.**

Conclusions. **Prescription data from general practice databases may be a valid, simple, and cost-effective method to evaluate and serially monitor the prevalence of AP.**

(Ital Heart J 2005; 6 (1): 49-51)

Received July 7, 2004; revision received November 9, 2004; accepted November 10, 2004.

Address:

Dr. Giampiero Mazzaglia

Health Search
Largo Cesare Cantù, 8
50134 Firenze
E-mail:
mazzaglia.giampiero@simg.it

Introduction

Basic information on the prevalence of angina pectoris (AP) in the general population is the prerequisite for planning prevention programs. In Italy, national statistics on morbidity are usually provided by questionnaire-based surveys carried out among representative samples of the general population[1]. However, the growing number of physicians using a computer to collect clinical information, has provided researchers with a means of detecting patients with AP in a very simple way. Previous studies have in fact demonstrated that the identification of patients who have been prescribed nitrates is a valid strategy to search for patients with AP[2]. We therefore decided to compare the prevalence of AP in Italy obtained using a computerized general practice database with that obtained from a population-based survey.

Methods

Population-based data were obtained from the sixth Health Interview Survey (HIS6), which has been carried out by the Italian Office for National Statistics[1]. First, 1449 towns were selected according to their geographical area and size of the population. Second, within each town, a sampling frame of the households was drawn up from a list provided by the local registries, thus recruiting 52 332 households and 119 799 subjects (response rate 90%).

Primary care-based data were obtained from 730 586 subjects aged ≥ 15 years and registered in the lists of 477 general practitioners participating in the Health Search Database (HSD), and being able to provide at least 2 years of valid database history before data extraction. The characteristics of the database have been described previously[3-5]. Briefly, all participating general practitioners were instructed to use specifically designed software in order to record data during their normal daily clinical practice. The software system codes all the diagnostic records on the basis of the ninth edition of the International Classification of Diseases (ICD-9)[6]. Prescription records are also coded according to the Anatomical Therapeutic Chemical classification system[7].

A unique identification number links patient demographic details, medical records (e.g. diagnoses, tests and test results, hospitalization, etc.), and drug therapy in an anonymous way so that the identity of the patients is not disclosed. In the HIS6, data on disease status were obtained through self-administered questionnaires. Cases from the HSD were those patients aged ≥ 15 years, with no history of myocardial infarction (ICD-9: 410, 412), who were prescribed nitrates at least twice during the 12 months before data extraction (i.e. March 31, 2002). The age-specific prevalence was calculated by dividing the number of detected cases by the number of individuals in each age group. The age-standardized prevalence was estimated by direct standardization performed using the Italian standard population. The number of AP patients in Italy was inferred by applying the proportion of patients with AP derived from our study to the whole Italian population as reported by ISTAT in 2002[8].

Results

The extraction yielded 10 442 patients with AP in the HSD (4772 males and 5670 females), and 1269 in the HIS6 (580 males and 689 females). The age-specific prevalence increased with age in both samples, with lower estimates reported in the HSD among patients < 65 years, and higher estimates in older patients (Table I).

The crude prevalence was higher in the HSD than in the HIS6, both for males (1374/100 000 vs 1006/100 000) and females (1449/100 000 vs 1007/100 000). Age standardization slightly decreased the prevalence in both samples, although the HSD always reported higher estimates (Table I). By applying the proportion of patients with AP derived from our study to the whole Italian population as reported by ISTAT in 2002, we calculated that in Italy 578 021 subjects (311 291 males and 266 730 females) could be AP patients.

Discussion

Our findings confirm that patients with AP may be identified by the use of disease-related drugs, and that this strategy may be more cost-effective than using self-reported information.

This method has two main limitations. First, not all subjects with AP use nitrates, leading to an underestimation of the true prevalence. Nitrate prescription alone does not guarantee that the diagnosis is correct, but only that the disease is severe enough to require pharmacotherapy or, more precisely, that nitrate treatment was judged to be appropriate by a physician (prescription by a general practitioner or suggested by a specialist). Nevertheless, using nitrates as a proxy measure may allow us to identify 70-80% of patients with AP[2]. On the other hand, some patients may be prescribed nitrates for reasons other than AP, such as heart failure and, rarely, off-label use.

Another limitation regards the comparison between the estimated defined daily doses/1000 inhabitants/day for nitrates in our sample (24.7), with those (29.9) reported by the Italian Department of Health[9]. This difference may be partially explained by both home visits and probable out-selection of the least healthy patients

Table I. Comparison of the age-specific and overall prevalence (expressed as number of cases per 100 000 individuals), as derived from the Health Search Database (HSD) and the sixth Health Interview Survey (HIS6), of angina pectoris among males and females.

Age groups	HSD		HIS6	
	Cases	Prevalence (95% CI)	Cases	Prevalence (95% CI)
Males				
15-24	1	2.3 (1.8-2.7)	–	–
25-34	2	3.2 (1.9-4.9)	2	17.7 (2.1-63.9)
35-44	20	30.9 (18.8-47.6)	13	124.3 (66.2-212.5)
45-54	181	337.5 (292.2-390.3)	58	633.1 (481.1-817.7)
55-64	650	1409.0 (1303.4-1520.7)	137	1715.9 (1442.5-2025.3)
65-74	1499	3908.1 (3716.3-4106.8)	208	3269.9 (2846.5-3736.8)
≥ 75	2419	6533.4 (6283.7-6789.9)	162	4169.9 (3563.1-4846.7)
Age-adjusted	4772	1124.3 (1120.1-1128.6)	580	1005.8 (1001.7-1009.8)
Females				
15-24	2	4.7 (2.9-7.3)	2	24.7 (15.1-38.1)
25-34	5	7.6 (2.4-17.7)	7	63.6 (25.5-131.0)
35-44	10	14.9 (7.1-27.4)	8	77.3 (33.4-152.4)
45-54	87	160.4 (128.4-197.8)	46	494.4 (362.2-659.0)
55-64	401	815.0 (737.4-898.4)	124	1446.2 (1204.2-1721.9)
65-74	1421	3110.2 (2952.8-3273.4)	196	2489.2 (2156.4-2857.7)
≥ 75	3744	6299.5 (6105.4-6497.8)	306	4348.4 (3883.8-4851.3)
Age-adjusted	5670	1214.6 (1210.4-1218.9)	689	1085.0 (1080.9-1089.0)

CI = confidence interval.

to hospitals or residential care, which could alter the results when patients remained on the general practitioner list but their nitrate prescriptions were no longer recorded at that practice.

However, the prevalence of AP in our study was slightly higher than that estimated by the HIS6[1]. In fact, in our sample the age-adjusted prevalence of AP was 1124/100 000 inhabitants among males and 1214/100 000 among females. By applying the proportion of patients with AP derived from our study to the whole Italian population estimated by ISTAT in 2002, we calculated that in Italy 578 021 subjects could be AP patients.

Since a recent study[10] with a 5-year follow-up reported an overall prevalence of angina among cardiovascular disease-free individuals of 1.58%, it is possible to assume that nitrate prescription is probably more sensitive that self-reported diagnoses in identifying AP.

In conclusion, notwithstanding the inevitable limitations, prescription data from general practice databases may provide a useful, simple, and cost-effective means of evaluating and serially monitoring the prevalence of AP, whose preventive burden is comparable to that of myocardial infarction. Actually in Italy, different sources of information on cardiovascular diseases are available, including the Italian Cardiovascular Epidemiologic Observatory[11], and prevalence/incidence estimates calculated using a mathematical method on the basis of official mortality and population data from national statistics and survival data on coronary events (MIAMOD)[12]. The HSD may therefore be added to the other epidemiological tools already available in Italy in order to implement major projects aimed at improving medical care services and to evaluate the impact of public health interventions in the population and among Italian general practitioners.

Acknowledgments

We thank Dr. Carlo Niccolai, managing director of the Health Search Database, for supplying the data, allowing us to use the Health Search Database, and for providing administrative assistance in the organization of meetings for the various contributors. We would also like to thank all participating physicians from the Health Search group who provided data for this study (http://simgweb.brinkster.net/healthsearch_ricercatori/ricercatori.asp).

References

1. Istituto Nazionale di Statistica. Condizione di salute e ricorso ai servizi sanitari. Anni 1999-2000. Roma: ISTAT, 2001.
2. Gray J, Majeed A, Kerry S, Rowlands G. Identifying patients with ischemic heart disease in general practice: cross sectional study of paper and computerised medical records. BMJ 2000; 321: 548-50.
3. Filippi A, Bignamini AA, Sessa E, Samani F, Mazzaglia G. Secondary prevention of stroke in Italy: a cross-sectional survey in family practice. Stroke 2003; 34: 1010-4.
4. Filippi A, Sabatini A, Badioli L, et al. Effects of an automated electronic reminder in changing prescribing behaviour among general practitioners in Italy: an intervention trial. Diabetes Care 2003; 26: 1497-500.
5. Cricelli C, Mazzaglia G, Samani F, et al. Prevalence estimates for chronic diseases in Italy: exploring the differences between self-report and primary care databases. J Public Health Med 2003; 25: 254-7.
6. World Health Organization. Statistical classification of diseases: injuries and causes of death. Vols 1 and 2. Geneva: WHO, 1977.
7. Collaborating Centre for Drug Statistics Methodology. ATC index with DDDs 2002. Oslo: WHO, 2002.
8. Istituto Nazionale di Statistica. Annuario statistico italiano 2002: popolazione. Roma: ISTAT, 2002.
9. The National Italian Drug Use Monitoring Centre. Drug utilization in Italy national report. Rome: National Institute of Health, 2002.
10. Yarnell J, Yu S, Patterson C, et al. Family history, longevity, and risk of coronary heart disease: the PRIME study. Int J Epidemiol 2003; 32: 71-7.
11. Giampaoli S, Panico S, Palmieri L, et al, for the Gruppo di Ricerca dell'Osservatorio Epidemiologico Cardiovascolare. Identification of individuals with high coronary risk in the Italian population: indications of the Italian Cardiovascular Epidemiologic Observatory. Ital Heart J Suppl 2001; 2: 1098-106.
12. Giampaoli S, Palmieri S, Pilotto L, Vanuzzo D. Incidence and prevalence of ischemic heart disease in Italy: estimates from the MIAMOD method. Ital Heart J 2001; 2: 349-55.