Int J Colorectal Dis (2007) 22:1459–1462
DOI 10.1007/s00384-007-0334-7

ORIGINAL ARTICLE

An assessment of the incidence of fistula-in-ano in four countries of the European Union

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Accepted: 22 May 2007 / Published online: 7 June 2007

Abstract
Background and aims In spite of its long history, fistula-in-ano is generally considered to be relatively uncommon. Nevertheless, no comprehensive analysis of its incidence in developed countries is available. Our goal was to determine the actual incidence of fistula-in-ano based on the study of incidence in four countries of the European Union (EU).
Materials and methods We performed a search of hospital inpatient databases in five different countries. We obtained valid data from four European countries, namely, England (UK; Hospital Episodes Statistics), Germany (German hospitals' databases), Italy (Scheda di Dimissione Ospedaliera), and Spain (Conjunto Mínimo Básico de Datos by Insalud—Spanish National Health Institute).
Results The incidence of fistula-in-ano varied among the different populations in the EU. In the four countries examined, it ranged from 1.04 per 10,000/year in Spain to 2.32 per 10,000/year in Italy. A statistical comparison of rates from the different countries studied gives a confidence interval from 1.20 up to 2.80. The population that we studied represents almost 51% of the total population of the EU.
Conclusion This study attempts to determine the actual incidence of fistula-in-ano in the European Community, which was previously uncertain despite its major negative effects on quality of life and the high cost of treatment. Our findings indicate that the incidence of fistula-in-ano in the four countries of the EU studied is significantly higher than that in the only previously published report of the incidence of fistula-in-ano in Europe. Nevertheless, our findings confirm the general perception that fistula-in-ano is a relatively uncommon disease.

Keywords Rectal fistula · Incidence · Epidemiology

Introduction

Fistula-in-ano has been well known for millennia because of its profound negative impact on the patient's quality of life. Treatment has changed little over time, as demonstrated by the cases of historical figures such as Louis XIV of France, "The Sun King." The king suffered from an anal fistula for more than 10 years, and it interfered with his ability to attend to matters of state. After many unsuccessful treatments, a decision was made to try surgery. In 1686, Charles-François Félix operated the king who was so happy with the outcome that he rewarded his surgeon with a large sum of money and a title [1].

Specific treatment centers, such as "St. Mark's Hospital for Fistula," were founded subsequently. St. Mark's, founded in 1835 in London, was probably the first hospital to be dedicated exclusively to rectal diseases, and it remains one of the most important institutions in modern proctology.

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In spite of its long history, fistula-in-ano is generally considered to be relatively uncommon. When one searches for exact figures on its incidence in the scientific literature, few references are found [2–4]. Moreover, those articles that are available all refer to the first of them, which provides the incidence of fistula among the inhabitants of Helsinki (Finland) and is based on 458 cases of anal fistula that were diagnosed over the course of 10 years. The authors concluded that the incidence of fistula-in-ano was 0.86 cases per 10.000 per year.

Thus, even though fistula-in-ano is a condition that is well known to colorectal surgeons, no comprehensive analysis of its incidence in developed countries is available.

Our goal was to determine the actual incidence of fistula-in-ano in the European Union (EU; by the study of four countries of the EU) and to evaluate the differences, if any, among these countries.

Materials and methods

Fistula is an abnormal connection or passageway between organs or vessels that normally do not connect. Anorectal fistulae are connecting the rectum or other anorectal area to the skin surface. This result in an abnormal discharge of feces through an opening other than the anus and is also called fistula-in-ano.

In the present "International Classification of Disease" (ICD-10), fistula-in-ano is identified by several codes. Fistulae of anal and rectal regions are indexed under codes K60.3 (anal fistula), K60.4 (rectal fistula), and K60.5 (anorectal fistula). The previous ICD (ICD-9) indexed anal fistula under code 565.1.

Overview of the strategy for identifying relevant sources

No published data on prevalence of this condition in the EU were found, and very limited data on incidence are available in the scientific literature. Alternatively, we looked in EUROSTAT for data that covered the entire EU of 25 countries (EU25). The request for information to EUROSTAT did not produce sufficiently detailed groups of data. The databases only included information on groups of diagnoses.

We then searched hospital databases. In developed countries, fistula-in-ano hardly ever goes undiagnosed because the associated intense discomfort makes the patient seek immediate medical assistance. Once a fistula has been diagnosed, it is almost always treated surgically in a hospital.

As the current best treatment for this condition is surgery, we examined European inpatient databases to obtain the most accurate accounting of cases, i.e., those that had either been diagnosed or that corresponded to patients who had undergone surgery.

It is important to emphasize that most of the registries count "episodes of fistula" rather than patients. In some cases, a single patient can be counted multiple times, as the patient is referred to consultants in different departments of the same hospital during the patient's stay.

We performed a search of hospital inpatient databases in five different countries in the EU. Our search on statistical data prepared by the French National Health Authorities was not successful. We did obtain data from four European countries, namely, England (UK), Germany, Italy, and Spain (Table 1).

The data collection methods used in each country were similar. The data consisted of summaries from databases in which records from hospitals had been collected and classified according to diagnosis. The classification of diagnosis varied among the countries. In England and Germany, diagnoses were classified according to ICD-10. We extracted diagnoses K60.3 (anal fistula), K60.4 (rectal fistula), and K60.5 (anorectal fistula) from their databases. Italy and Spain were still using the ICD-9 classification; therefore, only data for 565.1 (anal fistula) were extracted.

In England, "Hospital Episodes Statistics" (HES) is the official database that is assembled from records that are generated originally by more than 300 separate National Health Service (NHS) trusts in England. Only public hospitals are included. The HES records refer to episodes (periods), which are defined as episodes of continuous admitted patient care under a given consultant. We used data collected from April 2003 to the end of March 2004. The reference population was the resident population in England in 2003, as indicated in the report.

In Germany, cases of anal fistula reported by the German hospitals' databases are based on records of full-time inpatients (excluding outpatients) who are discharged from hospitals during the course of 1 year. The hospitals include all private trusts in Germany. The reference population was the population in Germany in 2002 (source: Destatis, Germany).

In Italy, inpatient statistics are based upon the discharge reports of patients with specific diagnoses (Scheda di Dimissione Ospedaliera [SDO]). Thus, every patient admitted to a hospital (public or private) produces a record at the time of discharge and is classified according to the main diagnosis during his or her hospital stay (ordinary or day hospital). The data that we examined were from 2002. The reference population was the population in Italy in 2002 (source: ISTAT, Italian Statistics Institute).

Table 1 Hospital databases from European countries

Country	Data source
England (UK)	HES (Hospital Episodes Statistics)
Germany	Health Statistics (Federal Statistics Office)
Italy	Health Statistics of the Italian Ministry of Health
Spain	Insalud (National Health Institute) database

In Spain, the data are based on records of discharged patients (Conjunto Mínimo Básico de Datos [CMBD] health data set). The data includes only data from public hospitals that are funded by Insalud (Spanish National Health Institute). Therefore, only the population treated in this public system was included in the calculation of incidence. The population included in this database was approximately one third of the whole. During our study, hospitals were being progressively transferred to regional authorities. No health statistics were available for Spain after 2001 because the healthcare system has been transferred to regional authorities, which no longer publish data suitable for this study.

Statistical methods

The incidence of fistula-in-ano was defined as the number of cases diagnosed every year per 10,000 inhabitants (patients per 10,000 inhabitants/year). Relationships between rates were calculated with data from Germany as a reference because its study population was the largest. If we assume that almost all diagnosed cases of fistula-in-ano are surgically treated and the duration of the entire course of the condition is generally less than 1 year, the incidence and prevalence of this condition can be considered to be the same [5].

Results and discussion

This study attempts to determine the actual incidence of fistula-in-ano in the European Community, which was previously uncertain despite its major negative effects on quality of life and the high cost of treatment. The incidence of fistula-in-ano varied among the different populations studied in the EU, it ranged in the four countries examined from 1.04 per 10,000/year in Spain to 2.32 per 10,000/year in Italy (Table 2). A statistical comparison of rates from the four countries gave a confidence interval from 1.20 up to 2.80. Only the data from Spain are outside and below this range.

The population studied represents almost 51% of the total population of the EU (source: EUROSTAT news release 105/2004, 31 August 2004); therefore, in terms of population size, our data should allow us to draw reliable conclusions.

Fistula-in-ano incidence was calculated based on hospital inpatient databases. We consider that the information extracted represents almost the total burden of the disease, given that surgery is the main treatment for the condition. In developed countries, we assume that all patients are treated and almost all undergo surgery within a maximum of several weeks of the onset of the condition.

We used two different classification systems the four countries, ICD-9 and ICD-10. ICD-10 allows a more detailed classification than ICD-9 but, from a clinical perspective, both systems are quite similar for fistula-in-ano and should not affect the figures. As the research performed was based on the records from hospitals classified according to diagnosis, it was not possible to obtain more information about the fistula tract, and no clinical classification (e.g., Parks Classification) was done. Neither could we determine the percentage of all fistulae that corresponded to perianal Crohn's disease.

Duplicated data represent one limitation of our study. Databases are, by law, anonymous, and therefore, it is possible that some data were duplicated for the same patient. The NHS database (England) is the only one in which this issue is assessed and duplication accounted for approximately 12% of episodes.

The year of data collection varied depending on the country, from 2001 to 2004. However, when we compared several consecutive years in a specific country, we found no significant variation among rates. Spain had the lowest incidence of anal fistula, and this might suggest that the incidence of fistula-in-ano is significantly different across the EU. However, we do not think that this is the case, especially when we compare the incidence in Italy (2.32 per 10,000/year) and in Germany (2.02 per 10,000/year). These rates are very similar despite regional differences. A more likely explanation might be found in the differences among health systems. In Germany and Italy, where hospital databases include private centers, the incidence is, as expected, higher than the other EU countries where only public trusts were taken into account. In Spain, several hospitals were being transferred to regional authorities during the period of study, which might have led to an underestimation of the actual number of cases of fistula-in-ano.

We conclude that the incidence of fistula-in-ano in the EU, according to the data obtained of four European countries: England (UK), Germany, Italy, and Spain, ranges from 1.20 to

Table 2 Incidence of fistula-in-ano in four European countries

Country	Diagnoses	Year	Number of cases	Population	Incidence (cases per 10,000/year)
England	K60.3 anal fistula, K60.4 rectal fistula,	2004	9,104	49,561,800	1.84
Germany	K60.5 anorectal fistula	2002	16,645	82,536,700	2.02
Italy	565.1 Anal fistula	2002	13,231	56,993,700	2.32
Spain (Insalud only)		2001	1,458	14,054,700	1.04

2.80 per 10,000 inhabitants per year. Our findings indicate that the incidence of fistula-in-ano in the EU is significantly higher than that in the only previously published report of the incidence of fistula-in-ano in Europe: 0.86 per 10,000 in Helsinki, published by Sainio [2]. Nevertheless, our findings confirm the general perception that fistula-in-ano is a relatively uncommon disease.

Acknowledgement The authors thank Prof. García-Caballero, Director of Preventive Medicine, La Paz University Hospital, Madrid (Spain), for his useful help with the statistical analysis.

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