

Surgical treatment for glaucoma in Italy: A five-year study period

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Abstract

Introduction

To evaluate the surgical treatment for glaucoma performed in Italy during a five-year period in patients > 45 olds.

Methods

Retrospective review of all hospital admissions listed according to ICD-9-CM codes with a diagnosis of primary and secondary glaucoma. The data were analyzed according to age groups and type of surgery. We examined the following surgical operations: procedures to improve the intraocular circulation (code 12.5) as goniosurgery, trabeculotomy ab externo and cyclodialysis, scleral filtering procedures (code 12.6), and other surgical procedures to lower ocular hypertension (code 12.7).

Results

Hospital admissions involving patients > 45 years with diagnosis of glaucoma were 101.746, while 33.838 surgical procedures were performed. On the whole, 8.312 operations for glaucoma were performed in 2000, 6.248 in 2001, 6.148 in 2002, 6.267 in 2003, and 6.863 in 2004. Filtering surgery was utilized in 72.8% of patients, 22 % of all the procedures were represented by cyclocryotherapy, cycloatermy, or cyclophotocoagulation, and the remaining surgeries were trabeculotomies ab externo.

Conclusions

During the study period the mean annual rate of glaucoma surgery was 0.01% of the entire population. Our data confirm that the majority of primary glaucoma may be successfully treated by medical or laser therapy, actually reducing the need of surgical treatment. As a consequence, surgery was performed merely for secondary and/or refractory glaucoma. A further consideration that emerges from this study is that surgery was performed only in 33.2% of the total hospital admissions for glaucoma. Taking into consideration the cost of Public Health, this figure represents a serious evidence of many avoidable hospital admissions in our country.

INTRODUCTION

Surgical treatment of glaucoma has decreased in the past decade after the introduction of new drugs^{1,2,3,4}. In this study, we investigated the number of hospital admissions and surgical procedures performed for this disease in Italy during the five-year period 2000-2004.

METHODS

The source of our data was the online database maintained by the Italian Ministry of Health⁵, and accessible through its website. It currently contains complete data on all admissions to inpatient healthcare facilities from 1 January 1999 through 31 December 2004. The information is based

on hospital discharge summaries and includes discharge diagnoses and all diagnostic and therapeutic procedures performed during the hospitalization, both of which are listed according to ICD-9-CM codes (International Classification of Diseases, ninth revision – Clinical Modification, 1997). In consideration of possible exclusion from the database of some hospital admissions or possible errors in clinical coding, we excluded the data for 1999, when the system was introduced in our country. For the five-year period 2000-2004, we recorded the number of hospital admissions involving patients > 45 years with discharge diagnoses of glaucoma (code 365, and subcategories: 365.1 for primary open angle, 365.2 for primary angle closure,

365.3 to 365.6 for secondary glaucoma, 365.8 and 365.9 for “other” forms, specified and not specified).

A second search was conducted to identify admissions that also included the following surgical operations: procedures to improve the intraocular circulation (code 12.5, except for code 12.59: laser trabeculoplasty, that we have excluded), as goniosurgery (codes 12.51 to 12.53), trabeculotomy ab externo (code 12.54), and cyclodialysis (code 12.55); scleral filtering procedures (code 12.6, including trabeculectomy: subcode 12.64); and other surgical procedures to lower ocular hypertension (code 12.7, as cyclocryotherapy, cyclodiatermy, cyclophotocoagulation, etc).

The data were analyzed according to patient age group (45-64, 65-74 and > 75 years).

Demographic data during 2000-2004 were obtained from the website of the Italian National Institute of Statistics₆.

RESULTS

In the five-year period analyzed, resident population registered in Italy was: 56.923.524 in 2000, 56.960.692 in 2001, 56.993.742 in 2002, 57.321.070 in 2003, and 57.888.245 in 2004.

ADMISSIONS WITH A DIAGNOSIS OF GLAUCOMA

From January 1, 2000 through December 31, 2004, total hospital admissions involving patients > 45 years with diagnosis of glaucoma (code 365) were 101.746. Of these, 32.308 involved patients 45-64 years of age, 35.387 between the ages of sixty five and 74 years, and 34.051 patients of more than 75 years. Total number of patients affected by an open angle glaucoma was 49.441, in 18.788 there was an angle closure glaucoma, while the remaining 33.517 patients presented secondary or “other” types of glaucoma. Twenty thousand six hundred sixty of the admissions occurred in 2000, 19.964 in 2001, 20.458 in 2002, 19.017 in 2003, and 21.647 in 2004.

During the five-year period analyzed the mean annual rate of hospital admissions involving patients > 45 years with diagnosis of glaucoma (code 365) was 0,03% of the entire population.

SURGICAL PROCEDURES

During the five-year period analyzed, a total of 33.838 surgical procedures for glaucoma were performed on patients older than 45 years. On the whole, 8.312 operations

for glaucoma were performed in 2000, 6.248 in 2001, 6.148 in 2002, 6.267 in 2003, and 6.863 in 2004. The mean annual rate of glaucoma surgery (all types) involving patients > 45 years was 0.01% of the entire population.

Goniosurgeries (11 in 2000, 7 in 2001, 19 in 2002, 10 in 2003, and 25 in 2004) and cyclodialysis (17 in 2000, 8 in 2001, 3 in 2002, 13 in 2003, and 16 in 2004) were rarely used. On the contrary, trabeculotomy ab externo was more frequently utilized (480 in 2000, 295 in 2001, 245 in 2002, 295 in 2003, and 275 in 2004). Total number of these three procedures was in five years 1.720 (508 in 2000, 310 in 2001, 268 in 2002, 318 in 2003, and 316 in 2004) corresponding to 5.1 % of all surgeries. The age-group and yearly distribution of hospital admissions with goniosurgeries, trabeculotomy and cyclodialysis are shown in Table 1.

Figure 1

Table 1: Age-group and yearly distribution of hospital admissions with goniosurgery, trabeculotomy ab externo and cyclodialysis (code 12.5)

age	45-65	65-74	> 75
year	total number		
2000	113	162	233
2001	95	116	99
2002	74	108	86
2003	100	99	119
2004	90	120	106

Filtering surgery (code 12.6) was utilized in 24.659 patients (6.555 in 2000, 4.522 in 2001, 4.296 in 2002, 4.430 in 2003, and 4.856 in 2004). They represented the 57 % of total operations (19.287 /33.838). On the whole, 4.601 trabeculectomies (code 12.64) were performed in 2000, 3.624 in 2001, 3.631 in 2002, 3.613 in 2003, and 3.818 in 2004. They represented the 57 % of total operations (19.287 /33.838). The age-group and yearly distribution of hospital admissions for filtering procedures are shown in Table 2.

Figure 2

Table 2: Age-group and yearly distribution of hospital admissions with filtering procedure (code 12.6)

age	45-65	65-74	> 75
year	total number		
2000	1518	2394	2643
2001	1245	1623	1654
2002	1181	1518	1597
2003	1246	1638	1546
2004	1439	1726	1691

Other surgical procedures as cyclocryotherapy, cyclodiatermy, cyclophotocoagulation, etc (code 12.7) were used in 7.459 cases , corresponding to 22 % of the total (1.249 in 2000, 1.416 in 2001, 1.584 in 2002, 1.519 in 2003, and 1.691 in 2004), as shown in Table 3.

Figure 3

Table 3: Age-group and yearly distribution of hospital admissions with other surgical procedures (code 12.7).

age	45-65	65-74	> 75
year	total number		
2000	377	462	410
2001	413	495	508
2002	488	506	590
2003	445	484	590
2004	560	516	615

DISCUSSION

Glaucoma is estimated to affect approximately 67 million people worldwide ⁷ and primary open-angle glaucoma (POAG) has a prevalence of between 1% and 2% of the adult population in the developed countries ⁸. On the basis of these data, we can evaluate that in Italy, with a resident population of about 57 million people, the number of patients with POAG ranges from 570.000 to 1.140.000 people. In addition, other forms such as primary angle closure glaucoma and secondary glaucoma have to be taken in account. Because of the management of the majority of cases as outpatients, it is very difficult to estimate the total number

of people affected by glaucoma in our country.

Appreciatively, this number may be obtained, as previously suggested ¹, by evaluating the percentage of total medications dispensed by pharmaceutical companies and the real public cost of anti-glaucomatous drugs. Nevertheless, overestimating data could be induced by prescriptions of combination therapies and by an exaggerate, because incorrect, use of topical drops by patients.

The treatment of glaucoma essentially consists in the reduction of intraocular pressure (IOP). This target is generally achieved by using topical therapy, while laser trabeculoplasty or incision surgery are performed if drugs fail to lower IOP adequately. Since the end of the 80s, after the introduction of topical β blockers, the medical therapy showed significant improvement. The subsequent introduction of dorzolamide, brinzolamide, brimonidine, and analogues of prostaglandins, used alone or in combination, still improved the ability to lower IOP and to avoid surgery. As a result, a clear and progressive reduction of glaucoma surgery occurred in the last years ^{1,2,3,4}. In the Netherlands, the number of glaucoma surgeries decreased of 45% from 1995 until 2000, and then stabilized during the period from 2001 to 2003 ². Similar reports have been observed in Scotland ¹ and in Ontario ³, while in Australia the rate of trabeculectomy has fallen by 58% in the period 1994-2003 ⁴.

In this retrospective study, we evaluated the number of all hospital admissions for glaucoma and the number of all patients submitted to surgery for this pathology in Italy from 2000 to 2004. During this period, the mean annual rates of hospital admissions and surgical treatments (all types) involving glaucomatous patients >45 years were 0.03% and 0.01% of the total population respectively. On the whole, 8.312 operations were performed in 2000, 6.248 in 2001, 6.148 in 2002, 6.267 in 2003, and 6.863 in 2004. A major consideration that emerges from our study is that a surgical therapy was performed only in 33.838 (33.2%) of the totality of hospital admissions for glaucoma (n= 101.746). Taking into consideration the total cost of Public Health, this figure represents a serious evidence of many avoidable hospital admissions.

Filtering surgery resulted the 72.8 % of all the procedures performed. However, an unexpected result was that the number of trabeculectomies, normally the most common surgical treatment for glaucoma ⁹, represented in our country only the 57 % of the total procedures (19.287 / 33.838). A possible reason of this data is that the majority of PAOG are

successfully treated by a medical therapy, thus reducing the need of surgery, and that in angle closure glaucoma a laser iridotomy may represent the first line treatment. As a result, surgical therapy should be performed only for secondary and/or refractory glaucoma. This possibility seems confirmed by the data of 33.517 hospital admissions for this latter diagnosis and by the fact that 22 % of surgical procedures were represented in a five-year period by cyclocryotherapy, cyclodiatermy, or cyclophotocoagulation (code 12.7).

An additional trend that emerged from our study was the relatively high number of trabeculotomies ab externo that was performed. This aspect is difficult to explain in an adult population, considering that this surgical procedure is generally used in the developmental glaucoma¹⁰ in which a common trend of the last years is to utilize a combined operation of trabeculectomy and trabeculotomy ab externo, which is considered safe and effective¹¹. Unfortunately, the data available through the Ministry of Health website did not allow us to determine the rate of this combined operation in Italy. It is possible that, in the absence of a precise code, some of these operations were codified only specifying the main procedure as corresponding to trabeculotomy ab externo and ignoring trabeculectomy. This consideration might also explain the higher number of trabeculotomies registered in 2000 when compared to the figures of this technique in the following years. Moreover, may be significant to recall possible errors in surgical coding that may have influenced this result in database.

Finally, there are some limitations to our study. The five-year period we analyzed is fairly short and we have no way of determining the number of surgical procedures performed

in the previous years in Italy. Then, further investigation is needed to determine how our data have maintained across time.

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