EDITORIAL

Health Care Costs of Asthma and Chronic Obstructive Pulmonary Disease

J. de Miguel Díez

Servicio de Neumología, Hospital General Universitario Gregorio Marañón, Madrid, Spain.

Asthma and chronic obstructive pulmonary disease (COPD) are among the most important respiratory problems we face today. The prevalence of these diseases in Spain is high, with rates ranging from 1% to 15% of the population for asthma[1,2] and around 9% for COPD in adults between 40 and 70 years of age.[3] Due to this high prevalence and increasing morbidity and mortality, both diseases generate considerable consumption of health care resources and impose a heavy economic burden on society. Thus, in developed countries, the financing of costs derived from asthma accounts for between 1% and 2% of public health resources.[4] The situation is similar for COPD, and it has been reported that the expenses generated by this disease are as high as 2% of the annual budget of the Spanish Ministry of Health and Consumer Affairs and 0.25% of the gross national product.[5] Furthermore, the impact of both diseases is expected to increase in the coming years as a result of increased prevalence, increased life expectancy, and the appearance of new drugs and therapeutic modalities.

Pharmacoeconomics is of great interest for the evaluation of health care resources, although it cannot be dissociated from other economic measures relevant to the care of patients with asthma and COPD. As for other diseases, costs for asthma and COPD can be classified as direct or indirect. The former category refers to the consumption of resources, such as acquisition of drugs, salaries of health care professionals, and use of health care services (visits to the emergency department, hospital admissions). Indirect costs, on the other hand, are determined by lost resources and include expenses due to absenteeism or disability, early retirement, or premature death.[6,7] The distribution of such expenses has been shown to be different for each respiratory disease. Thus, for example, in a comparative study carried out in the Netherlands, medication was shown to be the major cost determinant in asthma, while hospitalization accounted for the greatest share of the cost of COPD. The annual cost for each COPD patient was thus twice as high as the cost for each asthma patient.[8] In studies carried out in Spain, higher direct costs were also found for COPD compared to asthma.[9,10]

In 1996 Barnes et al[11] reviewed 9 studies on the cost of asthma in various industrialized countries and tried to shed some light on the components of costs associated with the disease. They observed that indirect costs accounted for more than 40% of the total in most of the studies. Noteworthy among these studies was the one carried out by Weiss et al,[12] in which it was estimated that the total cost of asthma in the United States was $6.2 billion (US $6.2 trillion) in 1990, $2.6 billion of which was due to indirect costs. Medication accounted for the greatest percentage of direct costs (more than 40%), followed by emergency department visits and hospitalizations (approximately 30%), and by professional fees, (approximately 25%). However, in the only such economic study published in Spain, direct costs were found to be lower, with indirect ones accounting for two thirds of the total.[10] Similar findings emerged from a recent study carried out in Germany.[13] In all cases, however, the pattern of costs is related to the severity and degree of control of the disease. Resource use increases with disease severity, so that the minority of asthma patients whose disease is severe are those who generate the highest costs, comparatively. It has been estimated, however, that about 70% of the total cost of the disease is attributable to poor control and management. An increase in the use of preventive antiinflammatory medication, improvements in the education of asthma patients, and adherence to the guidelines established by scientific associations are measures that may lead to improved control of the disease and a reduction in associated costs.[6,13,14]

Several studies have also been undertaken to try to quantify costs associated with COPD.[9,15-17] It has been estimated that the mean cost of health care for a patient with COPD from diagnosis to death is about €30 000.[18] In a recently published study (IBERPOC) evaluating direct costs of COPD in Spain (reference year, 1997) based on a representative sample population between the ages of 40 and 69 years, it was found that hospitalization accounted for the highest expenditure (41% of the total), followed by drug therapy (37%).[15] Another important finding of this study was that costs increased with increased severity of the disease; thus,

Correspondence: Dr. J. de Miguel Díez.
Alcalá, 582, 3.º, centro izqda. 28022 Madrid. España.
E-mail: jmiguel.hgugm@salud.madrid.org

Manuscript received January 14, 2005. Accepted for publication January 14, 2005.

the cost of severe COPD was 7 times that of mild COPD and 3 times that of moderate COPD. The annual cost of the disease was €238.82 million. While other studies carried out in Spain showed differences in the global cost of the disease, due either to methodological differences or to discrepancies in managing the disease at different time periods, the distribution of costs was similar.[9,16,17] Thus, for example, in the IDENTEPOC study (reference year, 2000) it was estimated that the cost of drugs alone (€293.59 million) surpassed the total cost estimated by Masa et al,[15] but that the percentage of the cost attributable to drug therapy (38%) was similar.[17] Increases in severity of disease lead not only to increases in expenditures, but to changes in the distribution of costs as well: hospitalization costs increase while costs attributable to medication decrease. Thus, the IDENTEPOC study showed that the percentage of the cost attributable to drug therapy accounted for 43% of the total direct costs of mild COPD, but that this percentage decreased to 37.6% for moderate COPD and to 28.4% for severe COPD.[17]

In addition to considering the costs of the disease, it is important to analyze whether resources are being used as efficiently as possible. Several recent studies carried out in Spain have shown that in many cases the diagnosis and treatment protocols followed stray from recommended clinical guidelines,[9,20] a situation that further increases the economic burden of the disease.[17] To give an idea of the magnitude of the problem, it has been estimated that drug therapy in COPD patients could be just as effective if only 73% of the resources currently consumed were used.[21] The recognition of this fact was one of the reasons for the development of the Global Initiative for Chronic Obstructive Lung Disease (GOLD)[22] and, more recently, the joint guidelines of the American Thoracic Society and the European Respiratory Society.[23]

The latest guidelines recommend a stepwise approach to the treatment of COPD, in which bronchodilators play a fundamental role.[22,23] The on-demand use of short-acting bronchodilators is recommended as initial treatment, but regular maintenance therapy is indicated as the disease progresses. Recently a new bronchodilating drug, tiotropium, was added to the therapeutic arsenal.[24] Tiotropium is a long-acting anticholinergic drug with pharmacological properties that allow administration in a single daily dose. Its efficacy, measured in terms of improvement in lung function, decrease in the number of exacerbations, and improvement in patients' quality of life, has been demonstrated in several trials.[25-28]

The present issue of ARCHIVOS DE BRONOCONEUMOLOGÍA includes a cost-effectiveness analysis whose aim is to determine the efficiency of tiotropium and the savings that would result from using that drug rather than ipratropium bromide and salmeterol to treat COPD.[29] García Ruiz and colleagues conclude that tiotropium is a cost-effective option, since, while it is more expensive, it leads to better clinical results than the other 2 therapeutic options evaluated, and thus contributes to important savings in hospital costs. The main limitation of the study is that the effects evaluated reflect results obtained under conditions that are ideal for medical intervention—the controlled clinical trials that were reviewed. It would be important to consider whether such results could also be obtained under real conditions, that is, in normal clinical practice. Also, the duration of the clinical trials that entered into the analysis was relatively short, and therefore efficiency cannot be predicted beyond 1 year. Furthermore, the study does not include data that would allow us to stratify the population into subgroups according to severity of disease or to analyze the effectiveness of tiotropium separately for each subgroup. Given that the effect of a drug on the number of exacerbations and hospital admissions (the principal determinants of cost) varies according to the degree of airway obstruction, such an analysis would be useful as it would make it possible to determine which subgroups of the population would benefit most from the widespread use of tiotropium therapy. A final limitation is that only direct health care costs were evaluated, not indirect ones. Nevertheless, the results obtained are in line with those of another recent study that used a similar method. In that study, the authors observed that, regardless of the variable evaluated, administering tiotropium was a more efficient option than using ipratropium bromide, as the cost per unit of effectiveness achieved was lower.[30] An analysis of the extra funds needed to obtain additional clinical benefits showed the amount to be less than for other health care interventions financed by the Spanish public health system. Other studies carried out outside of Spain have also shown the systematic use of tiotropium to be highly cost effective in treating COPD, as it offers considerably greater therapeutic benefits at a reasonable additional cost.[31,32]

These considerations highlight the importance of improving the quality of our approach to asthma and COPD. In this way, not only will we help our patients and alleviate their symptoms, but we will also help to free up health care resources. Such measures are much needed in view of the current situation of health care. In evaluating new diagnostic or therapeutic interventions we should consider their economic impact in addition to clinical parameters. This will allow us to improve the overall efficiency of our health care system in general, and of the control of patients with asthma and COPD in particular.

REFERENCES

1. Grupo español del estudio europeo de asma. Estudio europeo de asma. Prevalencia de síntomas relacionados con el asma en cinco áreas españolas. Med Clin (Barc). 1995;104:487-92.
2. Grupo español del estudio europeo del asma. Estudio europeo del asma. Prevalencia de hiperreactividad bronquial y asma en adultos y jóvenes de cinco áreas españolas. Med Clin (Barc). 1996;106: 761-7.

3. Sobradillo V, Miratvilles M, Gabriel R, Jiménez-Ruiz CA, Villasante C, Masa JF, et al. Geographic variations in prevalence and underdiagnosis of COPD. Results of the IBERPOC multicentre epidemiological study. Chest. 2000;118:981-9.
4. National Institutes of Health. Global strategy for asthma management and prevention. Publication n.º 02-3659. Bethesda: National Heart, Lung and Blood Institute; 2002.
5. Álvarez-Sala JL, Cimas E, Masa JF, Miravitlles M, Molina J, Naberan K, et al. Recomendaciones para la atención al paciente con enfermedad pulmonar obstructiva crónica. Arch Bronconeumol. 2001;37:269-78.
6. Plaza Moral V. Farmacoeconomía del asma. Med Clin Monogr (Barc). 2003;3 Supl 1:49-53.
7. Miravitlles M. Evaluación económica en la EPOC. Arch Bronconeumol. 2001;37 Supl 2:38-42.
8. Rutten-van Mölken MP, Postma MJ, Joore MS, van Genugten ML, Leidl R, et al. Current and future medical costs of asthma and chronic obstructive pulmonary disease in The Netherlands. Respir Med. 1999;93:779-87.
9. Miravitlles M, Murio C, Guerrero T, Gisbert R. Costs of chronic bronchitis and COPD. A one year follow-up study. Chest. 2003; 123:784-91.
10. Serra Batlles J, Plaza V, Morejon E, Comella A, Brugues J. Costs of asthma according to the degree of severity. Eur Respir J. 1998; 12:1322-6.
11. Barnes PJ, Jonsson B, Klim JB. The costs of asthma. Eur Respir J. 1996;9:636-42.
12. Weiss KB, Gergen PJ, Hodgson TA. An economic evaluation of asthma in the United States. N Engl J Med. 1992;326:862-6.
13. Stock S, Redaelli M, Luengen M, Wendland G, Civello D, Lauterbach KW. Asthma: prevalence and cost of illness. Eur Respir J. 2005;25:47-53.
14. Plaza Moral V, Álvarez Gutiérrez FJ, Casan Clarà P, Cobos Barroso N, López Viña A, Llauder Rosselló MA, et al. Guía española para el manejo del asma. Arch Bronconeumol. 2003;39 Supl 5:3-42.
15. Masa JF, Sobradillo V, Villasante C, Jiménez-Ruiz CA, Fernández-Fau L, Viejo JL, et al. Costes de la EPOC en España. Estimación a partir de un estudio epidemiológico poblacional. Arch Bronconeumol. 2004;40:72-9.
16. Gabinete de Estudios Sociológicos Bernard Krief. Impacto social y económico de la EPOC en España. Madrid: Zambon-SEPAR; 1995.
17. Izquierdo-Alonso JL, de Miguel-Díez J. Economic impact of pulmonary drugs on direct costs of stable chronic obstructive pulmonary disease. COPD. 2004;1:215-33.
18. Hilleman DE, Dewan N, Malesker M, Firedman M. Pharmacoeconomic evaluation of COPD. Chest. 2000;118:1278-85.
19. de Miguel Díez J, Izquierdo Alonso JL, Molina París J, Rodríguez González-Moro JM, de Lucas Ramos P, Gaspar Alonso-Vega G. Fiabilidad del diagnóstico de la EPOC en atención primaria y neumología en España. Factores predictivos. Arch Bronconeumol. 2003; 39:203-8.
20. de Miguel Díez J, Izquierdo Alonso JL, Rodríguez González-Moro JM, de Lucas Ramos P, Molina París J. Tratamiento farmacológico de la EPOC en dos niveles asistenciales. Grado de adecuación a las normativas recomendadas. Arch Bronconeumol. 2003;39:195-202.
21. Figueras M. Estimación del impacto de las prácticas asistenciales no recomendadas en el abordaje de la EPOC. Barcelona: Romargaf; 1999.
22. Pauwels RA, Buist AS, Calverley PMA, Jenkins ChR, Hurd SS, on behalf of the GOLD Scientific Committee. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. NHLBI/WHO Global Initiative for Chronic Obstructive Lung Disease (GOLD) workshop summary. Am J Respir Crit Care Med. 2001;163:1256-76.
23. Celli BR, MacNee W, and committee members. Standards for the diagnosis and treatment of patients with COPD: a summary of the ATS/ERS position paper. Eur Respir J. 2004;23:932-46.
24. Gross NJ. Tiotropium bromide. Chest. 2004;126:1946-53.
25. van Noord JA, Bantje TA, Eland ME, Korducki L, Cornelissen PJ. A randomised controlled comparison of tiotropium and ipratropium in the treatment of chronic obstructive pulmonary disease. The Dutch tiotropium study group. Thorax. 2000;55:284-94.
26. Casaburi R, Mahler DA, Jones PW, Wanner A, San PG, ZuWallack RL, et al. A long-term evaluation of once-daily inhaled tiotropium in chronic pulmonary obstructive disease. Eur Respir J. 2002;19:217-24.
27. Vincken W, van Noord JA, Greefhorst AP, Bantje TA, Keste S, Korducki L, et al. Improved health outcomes in patients with COPD during 1 year´s treatment with tiotropium. Eur Respir J. 2002;19:209-16.
28. Donohue JF, van Noord JA, Bateman ED, Langley SJ, Lee A, Witek TJ, et al. A 6-month, placebo controlled study comparing lung function and health status changes in COPD patients treated with tiotropium or salmeterol. Chest. 2002;122:47-55.
29. García Ruiz AJ, Leiva Fernández F, Martos Crespo F. Análisis del coste-eficacia del tiotropio frente al ipratropio y salmeterol. Arch Bronconeumol;41:2005;242-8.
30. de Lucas Ramos P, Miravitlles M, Rodríguez González-Moro JM, de Miguel Díez J, López Martín S, Sánchez Muñoz G. Análisis coste-efectividad del empleo de tiotropio versus ipratropio en el tratamiento de los pacientes con enfermedad pulmonar obstructiva crónica. Pharmacoeconomics Spanish Research Articles. 2004; 1:123-30.
31. Oostenbrink JB, Rutten-van Mölken MPMH, AI MJ, van Noord JA, Vincken W. One-year cost-effectiveness of tiotropium versus ipratropium to treat chronic obstructive pulmonary disease. Eur Respir J. 2004;23:241-9.
32. Friedman M, Menjoge SS, Anton SF, Kesten S. Health care costs with tiotropium plus usual care versus usual care alone following 1 year of treatment in patients with chronic obstructive pulmonary disorder (COPD). Pharmacoeconomics. 2004;22:741-9.