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INTRODUCTION

A wide variety of inhalation devices are available in Europe for administration of aerosol medications. They can be classified as pressurised metered-dose inhalers (pMDIs), dry-powder inhalers (DPIs) or nebulised aerosols. Although such variety increases the likelihood of finding an inhaler to suit every patient, for prescribers it complicates choosing a device and keeping abreast of what is available and how to use it properly.

To investigate how far national prescribing practice for inhaled drugs varies across Europe, we assessed European retail sales data for inhaled medications delivered by pMDIs, DPIs, and liquids for nebulisation commonly used for the treatment of asthma and chronic obstructive pulmonary disease.

METHODS

Data source. We retrospectively evaluated retail sales of short- and long-acting bronchodilators (either beta-adrenergic or anticholinergic agents), inhaled corticosteroids (ICS) and combinations of long-acting beta-adrenergic bronchodilators with ICS using the IMS Health databases. Owing to their now small contribution to the anti-asthma armamentarium, retail sales of sodium cromoglicate and nedocromil sodium were not evaluated. IMS is an international healthcare information company specializing in the collection and interpretation of anonymized health information, and often the only source of information on aspects of medicine utilization across the world. Its databases represent an invaluable source for pharmacoepidemiological studies. For the purpose of the present study, we used the IMS DPM audit (database) covering inhaler sales data for 7 years (from 2002 to 2008) in Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Italy, The Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom. For each country, data represented the supply of the full range wholesalers to the public pharmacies plus the direct supply of the manufactures to the public pharmacies via a representative panel of approximately 4000 pharmacies.

Data analysis. For each considered country, the annual inhaler retail sales over the period from 2002 to 2008 were averaged and expressed as percentages of the total numbers of units sold. For pMDIs and DPIs, a unit was defined as a single inhaler; for liquids, a unit was defined as a single package of nebuliser solution. Differences in inhaler retail sales between countries, as well as between different inhaled medications were assessed using the chi-squared test. In all cases $P < 0.05$ was considered as significant. Statistical analyses were carried out using GraphPad Prism.

RESULTS

Overall during this 7 year observation period, of the mean numbers of inhaler "units" sold 47.5% were pMDIs, 39.5% were DPIs and 13% were liquids for nebulisers. The distribution of units sold differed markedly ($P < 0.01$) between the European countries studied, with pMDI retail sales greatest in the United Kingdom, Germany and Spain compared to the other countries in which retail sales of DPIs prevailed (Figure 1). Notably, the sale of solutions for nebulisers was significantly ($P < 0.01$) higher in Italy (Figure 1) than in the other considered countries. In the case of retail sales of inhalation devices delivering bronchodilators, the pMDI is the most frequently used inhaler device. In contrast, retail sales of DPIs are similar to those of pMDIs when considering ICS, or higher in the case of combinations of bronchodilators and ICS (Figure 2).

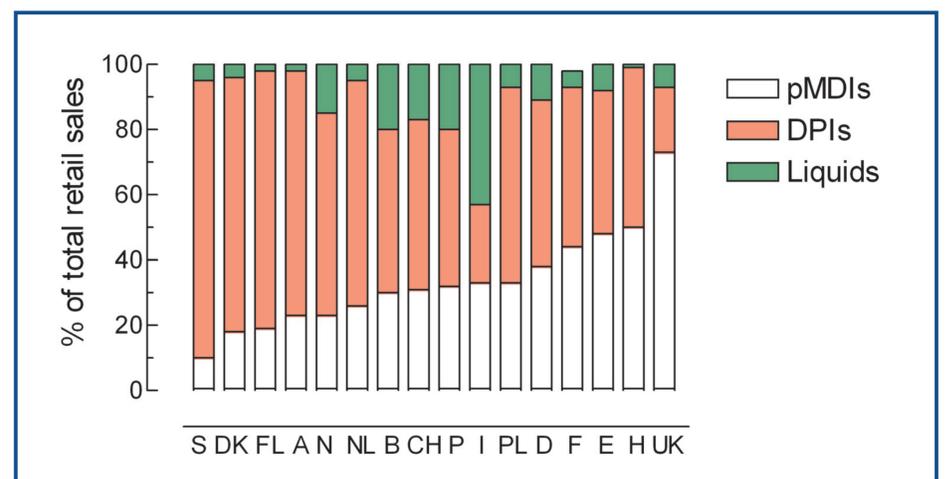


Figure 1. Retail sales of inhalation devices, expressed as percentages of the total retail sales, in 16 European countries in the time period 2002-2008. A, Austria; B, Belgium; CH, Switzerland; DK, Denmark; E, Spain; F, France; F, Finland; H, Hungary; I, Italy; D, Germany; N, Norway; NL, The Netherlands; P, Portugal; PL, Poland; S, Sweden; UK, United Kingdom

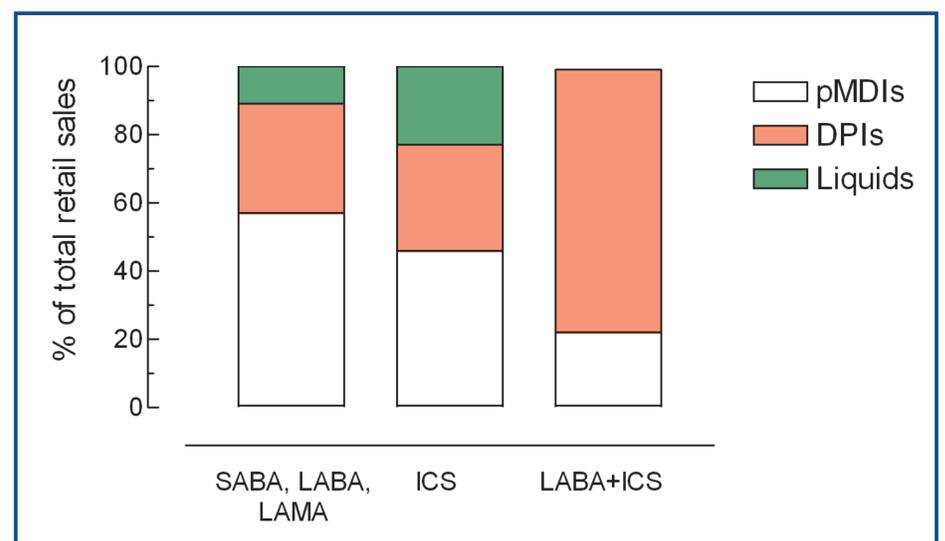


Figure 2. Retail sales of inhalation devices delivering short-acting bronchodilators (SABA), long-acting beta adrenergic and antimuscarinic bronchodilators (LABA, LAMA respectively), inhaled corticosteroids (ICS) and their combination expressed as percentages of the total retail sales, in the considered European countries in the time period 2002-2008.

CONCLUSION

The results indicate that the pMDI is the most frequently prescribed inhalation device in Europe, likely because of its low cost and versatility in delivering the widest range of inhaled medications. However, we found a considerable variability in the types of inhalers sold between European countries. Cost, health insurance, commercial aspects, prescribers' and patients' preferences may explain this variation. These data suggest a need for more uniform, outcome-led inhaler prescribing practice across Europe, better education about the advantages and limitations of specific devices for prescribers and patients to improve the efficacy and cost effectiveness of the treatment of obstructive airways diseases.

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