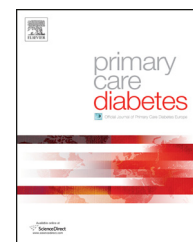




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Original research

Patterns of glucose lowering drugs utilization in Portugal and in the Netherlands. Trends over time



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ABSTRACT

Aims: To compare the temporal trends in the consumption patterns of glucose lowering drugs (GLD) between Portugal and the Netherlands from 2004 to 2013 and to examine possible reasons behind the cross-national variation found.

Methods: All GLD (ATC pharmacological subgroup A10B) were selected for analysis. Consumption data were obtained for the 10-year period. Portuguese and Dutch drug estimates were obtained from nationwide databases.

Results: The consumption of GLD increased in Portugal from 52.9 defined daily dose per 1000 inhabitants per day (DHD) in 2004 to 70.0 DHD in 2013 and in the Netherlands from 44.9 DHD in 2004 to 50.7 DHD in 2013. In Portugal, the use of fixed-dose combinations, especially with dipeptidyl peptidase-4 inhibitors (DPP-4) increased remarkably and in 2013 represented almost a quarter of total GLD consumption. In the Netherlands, the use of combinations was residual.

Conclusions: The consumption of GLD rose over the 10-year period in both countries. However, Portuguese overall consumption and costs of GLD were higher. The differentially rapid uptake of DPP-4 inhibitors in Portugal was the main driver of the cost difference.

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1. Introduction

The incidence and prevalence of type 2 diabetes has been growing globally [1]. This trend has been associated with,

among other reasons, ageing populations, rising obesity and increasingly sedentary lifestyles [2,3]. Currently, more than 56 million people in the European Region have diabetes and by 2035 this number is projected to rise to 69 million [4]. Based on the first Portuguese diabetes prevalence study (PREVADIAB)

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[5], in 2012, a high prevalence of 12.9% was found in the population aged between 20 and 79 years. Portugal has one of the highest prevalence of diabetes in Europe and therefore it is not surprising that it is one of the national health priority areas [6]. In the Netherlands, the prevalence of type 2 diabetes is lower than in Portugal. In 2011, estimates indicate that 7.3% of the Dutch population aged 20–79 years had diabetes [7].

Although life style changes play an important role in type 2 diabetes treatment, most patients also require pharmacotherapy targeted to glycaemic, blood pressure and lipid levels control [8,9]. Glycaemic management in type 2 diabetes has become increasingly complex and somewhat controversial; with a widening range of glucose lowering drugs (GLD) now available, concerns have been raised about their safety and new uncertainties regarding intensive glycaemic control on macrovascular complications [10,11].

A comparison between Portugal and the Netherlands is interesting in many aspects. These two European countries have many demographic features in common. Their population is growing slowly, the age structure is becoming older and although Portugal has a larger proportion of those aged 65 or over (17.9% vs. 15.3%), the median age is almost coincident [12]. In both countries, the majority of type 2 diabetic patients are treated in primary care [6,13] and both national Portuguese [14] and Dutch [15] type 2 diabetes guidelines recommend metformin as first-line product of choice. However, there are some differences between countries that should be noted. The Dutch healthcare system relies on a health insurance system where insurers negotiate with providers on price and quality and patients choose the provider they prefer and join a health insurance policy which best fits their condition [16]. Unlike Portugal, the Netherlands has a long tradition of producing clinical guidelines. In particular, the national guidelines for type 2 diabetes have existed for almost 25 years [17]. In Portugal, healthcare is provided largely by the publicly funded National Health Service which has universal coverage and is financed mainly through taxation [18]. Recently, due to the current financial crisis and as one of the measures of the Memorandum of Understanding (MoU) signed between the Portuguese Government and the European Commission, International Monetary Fund and the European Central Bank [19], the development and implementation of clinical guidelines on the basis of international guidelines was fast-tracked. Specifically, Portuguese guidelines on treatment of type 2 diabetes were issued in September 2011 [14].

At the end of 2013, six different oral medication classes were available and reimbursed in Portugal for the treatment of type 2 diabetes. These include biguanides, sulfonylureas, alpha-glucosidase inhibitors, thiazolidinediones, meglitinides, and dipeptidyl peptidase-4 inhibitors (DPP-4). In the Netherlands, in addition to these therapeutic classes, glucagon-like peptide-1 (GLP-1) receptor agonists were marketed and reimbursed under certain conditions (e.g., patients with body mass index ≥ 35 kg/m² with no control with the combination of metformin and sulfonylurea).

The impact of the introduction of new GLD in the last decade [10] on the changes in consumption patterns remain poorly documented. In this scope, cross-national drug utilization research, where GLD have been of interest since their introduction into Europe [20], can play a role in helping to

quantify, understand and to evaluate the drug usage process and ultimately to contribute to the rational use of drugs [21]. The aim of this study is to compare the temporal trends in the use of GLD between Portugal and the Netherlands from 2004 to 2013, to measure any inter-country variability and to examine possible reasons behind this.

2. Methods

Portuguese estimates of drug consumption were obtained through the CEFAR Pharmacy Sales Information System. This is a nationwide database providing representative national and regional estimates of drug dispensing data for all ambulatory care, based on sell-out sample data (prescription and non-prescription medicines, health products and pharmacy services) from 81.7% of all Portuguese pharmacies (2381 out of 2916 pharmacies). Drug dispensing data is estimated at national and regional levels using sampling fractions (stratified sampling methodology) according to the geographical location and pharmacy income. This database is linked to other administrative databases, gathering information about drug and grouped-population characteristics and regional codes for spatio-temporal analysis. Annual data on the size of the population was obtained from the Portuguese Institute of National Statistics.

Dutch drug consumption and population estimates were retrieved from the Dutch Drug Information System (GIP)/National Health Care Institute. GIP database collects prescription data both at provider and patient levels referring to a representative sample of more than 12 million people (3/4 of the Dutch population) from regions across the Netherlands, which is extrapolated to the total Dutch population [22]. Both databases do not include hospital consumption of medicines.

All GLD (Anatomical Therapeutic and Chemical (ATC) classification: pharmacological subgroup A10B) were selected for analysis. Consumption data were obtained for the 10-year period (2004–2013) and were expressed in defined daily doses (DDD) per 1000 inhabitants per day (DHD) using the ATC/DDD system developed by World Health Organization Collaborating Centre for Drug Statistics Methodology [23]. The DDD is defined as the assumed average daily maintenance dose for its main indication use in adults. Total costs are in euros, based on pharmacy retail price, and cost per DDD were retrieved from databases or calculated.

Drug consumption was described for overall GLD utilization and for each chemical subgroup or substance. Market share was provided for the consumption in DHD of selected GLD (chemical subgroup or substance; brand vs. generics) and calculated as a percentage of all GLD consumption. Linear regression models were used to explore trends in overall GLD and in biguanides (metformin) consumption over time. Analysis of covariance (ANCOVA) was used to compare regression lines and to evaluate differences between countries. For the year 2013, the potential reduction in Portuguese GLD expenditure was estimated simulating the Dutch GLD consumption pattern scenario (% DDD), using the mean cost/DDD in Portugal as reference. The difference between the observed expenditure in 2013 and the expected expenditure in the simulated scenario was computed. Statistical significance adopted

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