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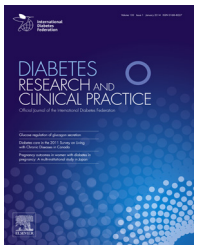

Trends in the prescription of antidiabetic medications from 2009 to 2012 in a general practice of Southern Italy: A population-based study

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ABSTRACT

Objective: To assess the prescribing pattern of antidiabetic drugs (AD) in a general practice of Southern Italy from 2009 to 2012, with focus on behaviour prescribing changes.

Methods: This retrospective, drug utilization study was conducted using administrative databases of the Local Health Unit of Caserta (Southern Italy) including about 1 million citizens. The standardized prevalence of AD use was calculated within each study year. A sample cohort of 78,789 subjects with at least one prescription of AD was identified during the study period.

Results: There was an overall increase of the proportion of the patients treated with monotherapy, which was significant for insulin monotherapy (from 11.2 to 14.6%, $p < 0.001$). The proportion of patients treated with metformin remained stable (from 68.3% to 67.8%, $p = 0.076$), while those receiving sulfonylurea dropped from 18.4% to 12.5% ($p < 0.001$); GLP-1 analogues and DPP-4 inhibitors showed the greatest increase (from 1.2% to 6.6%, $p < 0.001$). In the whole sample of 25,148 new AD users, metformin was the most commonly prescribed drug in monotherapy (41.9%), while insulin ranked second (13.3%).

Conclusion: This study shows a rising trend of AD monotherapy, with sulfonylureas and incretins showing the more negative and positive trend, respectively.

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1. Introduction

Diabetes is one of the most chronic diseases worldwide, with about 592 million people being affected by 2035 [1]. According to the World Health Organization (WHO), diabetes will represent the 7th leading cause of death in 2030, with an estimated prevalence of 7.8% [2]. A steady increase of diabetes prevalence has also been registered in Italy [3], from 3.9% in 2001 to 5.0% in 2012. The two main forms of diabetes are type 1 diabetes, characterized by deficient insulin production, and type 2 diabetes, characterized by a mixture of insulin resistance and insulin deficiency; over 90% of cases are represented by type 2 diabetes [4]. The global rising of obesity and sedentary lifestyle represent hard risk factors for type 2 diabetes. Diet, exercise and drugs are the mainstay of diabetes management [5–8]. In the last decade, the available pharmacological options have expanded with the introduction of new antidiabetic drugs (ADs), such as the glucagon-like peptide-1 (GLP-1) analogues and the dipeptidyl peptidase-4 (DPP-4) inhibitors. The rising of diabetes prevalence and the availability of these new drugs represent the main cause of the increased ADs utilization and related costs worldwide. To date, several studies have analysed the trend in the use of ADs, which indicated an increased trend in consumption of these drugs over time, with sharp differences between and within countries [9–19]. In Italy, data on drugs consumption in 2012 showed that drugs in the ATC group A ''alimentary tract and metabolism'', which includes ADs, were those with an higher increase in expenditure (+22.5%) and consumption (+7.8%) compared with data of 2011 [20]. A picture of ADs prescription data in Italy is only available from some Northern Italian Counties, and is consistent with other worldwide scientific evidence [18,19]. Within this scenario, and in light of the recent introduction on the market of new ADs, the aim of this study was to assess the prescribing pattern of ADs in a general practice of Southern Italy, with focus on behaviour prescribing changes.

2. Materials and methods

This retrospective, drug utilization study was conducted using administrative databases of the Local Health Unit (LHU) of Caserta from Campania region (Southern Italy). The source population included about 1 million citizens living in the catchment area of Caserta. The database collects anonymized claims data about: (a) drugs routinely dispensed to the patients and reimbursed by the Italian National Health System, prescribed by either general practitioners (GP) or specialists working in both public and private sector; (b) drugs directly supplied to patients by LHU (Direct Distribution, DD), or by hospitals through local pharmacies (DPC), both at enrolment and during the follow-up period. Dispensing data contained information about unique patient identifier, patients' demographics, branded and generic drug name and related Anatomical Therapeutic Chemical (ATC) classification code, quantity and dispensing date. These databases were linked anonymously using encrypted patient codes according to the Italian law for confidentiality data. No ethical approval is required for using encrypted retrospective information. Since type 1 and type 2 diabetes could not be accurately distinguished from the available data, the type of diabetes was not considered in this analysis.

2.1. Study population

From the source population, we identified all the subjects with at least one AD prescription during the study period January 1st, 2009 to December 31st, 2012. Moreover, according to the inclusion criteria, patients had to be alive, registered in the list of LHU for 2 years, during which they had to receive drug prescription reimbursed by the Italian National Health System, until the date of AD prescription. No age restriction was applied. The drug exposure under study included all ADs (ATC: A10*). According to their first prescription during the enrolment period, patients were stratified in two main categories: (a) monotherapy; and (b) polytherapy and each of them into two sub-categories. Patients with a first prescription of only one drug belonging to the biguanides (A10BA), sulfonamides, urea derivatives (A10BB), α-glucosidase inhibitors (A10BF), thiazolidinediones (A10BG), dipeptidyl peptidase-4 inhibitors (A10BH) and others blood glucose lowering drugs (A10BX), were included in the monotherapy AD. Patients with the first prescription of only one of the insulin group (human: A10AB01, A10AC01, A10AD01 and analogues: A10AB04, A10AB05, A10AB06, A10AC04, A10AD04, A10AE04, A10AE05 or A10AD05) were included in the insulin monotherapy group. The polytherapy group was distinguished as fixed combination group that was made up of patients with prescription of drugs in the ATC A10BD (combinations of oral blood glucose-lowering drugs), and no-fixed combination group, composed of subjects with an overlapping period from the first and second prescription of oral AD of at least 15 days. This definition is consistent with the indications reported in previous studies [21,22].

2.2. Statistical analysis

One-year prevalence of AD treatment was evaluated, for each year, as the ratio between the number of patients who received at least one AD prescription during the observational year and the number of all resident subjects alive in the same period. Yearly incidence of AD treatment was assessed as the number of new AD users per year divided by the number of residents at risk of receiving an AD prescription (i.e. alive residents during the observation year minus prevalent AD user at the end of the previous years). New users were identified as patients receiving at least one AD prescription during the observational year, without any recorded AD prescription in the previous year. Both prevalence and incidence of use were expressed as rates per 1000 inhabitants together with 95% confidence interval (CI). Frequency analyses by age-category over the study period were also conducted. The incidence of AD treatment was also stratified by drug class for each study year. The Cochran–Armitage test was used to assess the statistical significance of patients' characteristics and prescribing patterns from 2010 to 2012. Significance was set at a level of $P < 0.05$. Statistical analyses were performed using STATA vs 11.1 (STATA Corporation, TX, USA).