Consumption of Insulins in Primary Health Care in Albania during 2010-2020

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Abstract

Aim: evaluation of trends in out-of-hospital utilization and to prescribe of Insulin in Albania using the Anatomic Therapeutic Chemical Classification/ Defined Daily Dose -(ATC/DDD methodology). Methods: The study was retrospective, and we analyzed the data collected from Health Insurance Institute (HII) of these drugs classes in the primary health care in Albania during 2010-2020. The data about the consumption of drugs were expressed as a number of Defined Daily Dose (DDDs) /1000 inhabitants/day. For all the period under study 2010-2020, there were collected and analyzed data of import and domestic production of drugs, which represent the real consumption of drugs in the country. These data were subsequently included in a comparative analysis with the utilization data according to the Health Insurance Institute. Results: The consumption of all insulin were 3.49-10.66 DDD/1000 inhabitants/day (respectively 2010-2020). The consumption of insulin fast-acting were 1.58-4.93 DDD/1000 inhabitants/day (respectively 2010-2020). The consumption of insulin intermediate-acting were 0.56-1.06 DDD/1000 inhabitants/day (respectively 2010-2020). The consumption of insulin intermediate-acting combined with insulin fast-acting was 1.00-1.46 DDD/1000 inhabitants/day. The consumption of insulin long-acting was 0.34-3.21 DDD/1000 inhabitants/day. Conclusions: There is an increase in Insulin use from HII covering but still low values in comparison with other countries.

Keywords: Drug utilization DDD, Insulin

Introduction

Diabetes mellitus (diabetes) is a chronic and potentially life-threatening condition where the body loses its ability to produce insulin, or begins to produce or use insulin less efficiently, resulting in blood glucose levels that are too high. Over time, blood glucose levels above the normal range can damage your eyes, kidneys and nerves, and can also cause heart disease and stroke.

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With type 1 diabetes, the body does not make any insulin and therefore insulin has to be injected regularly every day to stay alive. With type 2 diabetes, the body does not make enough insulin, or the insulin that is made does not work well. Insulin injections are sometimes needed to manage blood glucose levels. Insulin is grouped according to how long it works in the body. Rapid- or short-acting insulin helps reduce blood glucose levels at mealtimes and intermediate or long-acting insulin helps with managing the body's general needs.

Insulin therapy is an essential part of diabetes management; all type 1 and most type 2 diabetes patients require insulin at some stage. Drug utilization studies using administrative pharmacy claims data can provide useful insights into the prescribing patterns and patient medication-taking behavior in typical usual-care settings [Okano GJ 1997, Venturini F 1999]. Thus, pharmacotherapy has the potential for significant clinical, economic, and humanistic impact. For these reasons takes a great importance the evaluation of drug utilization parameters associated with pharmacological management of type 1 and two diabetes among members of a large drug-insured population.[Kakariqi et al. 2016]

Materials and Methods

The data were obtained from the Health Insurance Institute (HII) [http://www.fsdksh.com.al, *last accessed July, 2022*]. All data were collected and analyzed reflecting the ambulatory and outpatient use for the period 2010-2020. The analysis included the total number of prescriptions, and quantities of drugs. The data about the population were obtained from the Institute of Statistics (INSTAT) [http://www.instat.gov.al/en *Last accessed July, 2022*]. The data about the consumption of drugs were expressed as a number of Defined Daily Dose (DDDs)/1000inhabitants/day. All drugs were classified by groups of Anatomic Therapeutic Chemical Classification (ATC).

Data on real consumption (import and domestic production)

For all the period under study 2010-2020 there were collected and analyzed data from the import and domestic production of the drugs, [http://www.dogana.gov.al/english/ *Last accessed July, 2022]*] which represent the real consumption of drugs in the country. It was noted that the increase in consumption from one year to another were small, e.g. the consumption from 2018 to 2020 (i.e. 3 years) was increased by only 1.96%. Consequently, in order to obtain an updated study, there were chosen the data of import and domestic consumption only for the last three years, 2018, 2019,2020, and those were involved in a comparative analysis with the equivalent consumption data according to HII. In order to minimize the effect of variations consumption-inventory balances from one year to another, it was calculated and put to analysis the annual average value of the three chosen years (on one hand that of the import and domestic consumption, and on the other hand that of HII).

II. RESULTS

The insulin included in the reimbursement list for this period were insulin fast-acting, insulin intermediate-acting, insulin intermediate-acting combined with insulin fast-acting and insulin long-acting. The last one was involved in the scheme since 2008.
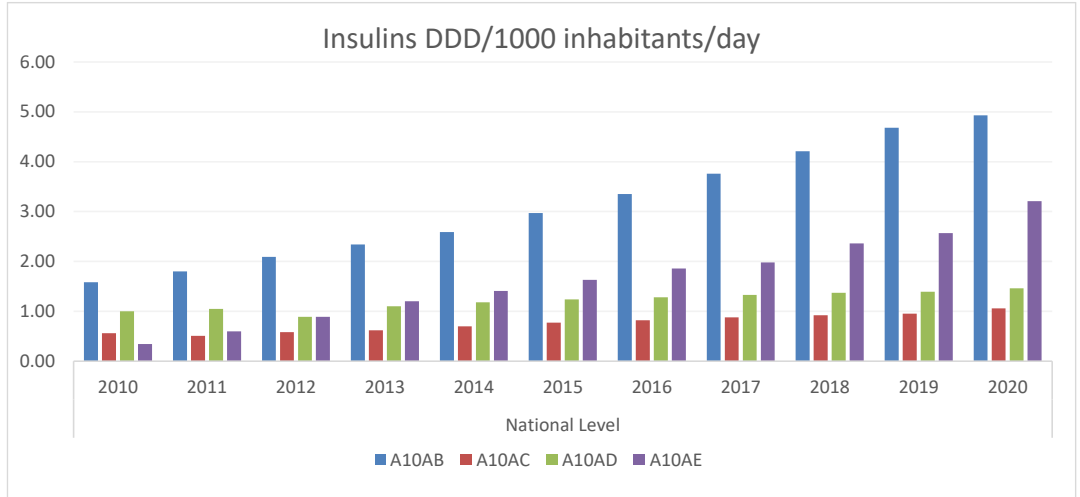

Figure 1 Annual average value of consumption of Insulin in national level in Albania
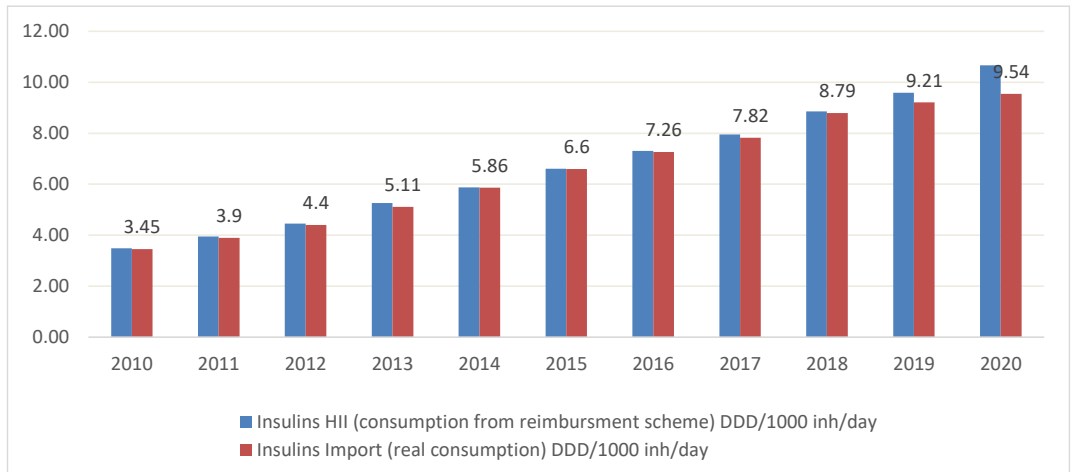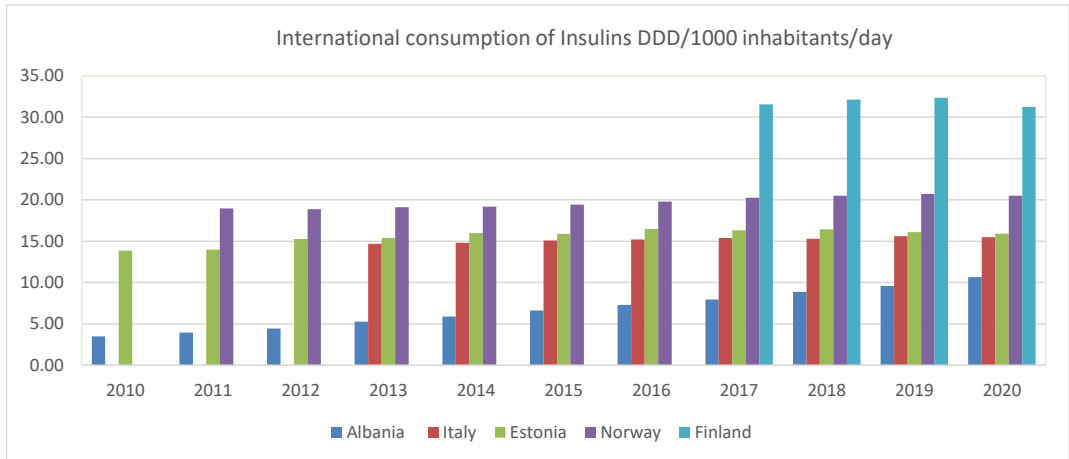

Figure 2 Annual average value of consumption of Insulin: consumption based on import (real consumption) [*] versus consumption based on HII.

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Figure 3 International comparison in the consumption of Insulin (DDD/1000 inhabitants/day): Albania, Italy [7], Estonia [8], Norway [9-12], Finland [13-16]

III. DISCUSSION

Diabetes mellitus consists in a metabolic pathology with multiorgans damages, which is accompanied by high expenses of the health insurance system. The primary objective of the treatment is to keep good control over glycemic values. The lack of control over glycemia exposes the diabetes patient to a high risk of acceleration, worsening of the disease and appearance of micro- and macrovascular complications [Boccuzzi Associates, 2001].

 In 2030, this number is expected to be double the current worldwide value [Wild S, et al 2004].

In Figure 1 can be noted an increase in consumption values that includes all insulin classes. The class with higher values of prescription are fast-acting insulin, meanwhile the class with the highest increase are long-acting insulin.

Aiming to understand better the real situation, we have included in the analysis the import data (representing the actual consumption) of antidiabetic drugs in the three latter years 2018, 2019, 2020.

In total, the use of insulin seems well-equilibrated, a fact evidencing that insulin are taken almost entirely under the reimbursement scheme. . The figures indicate that for rapid-acting insulin, the most used group of insulin, the consumption based on the HII is higher than the real consumption based on import data – a fact which cannot be true considering that import data include all drugs that are distributed in the primary health care service in our country. This finding can be explained with the fictive prescriptions by doctors for the most used group of insulin.

Therapeutic guides increasingly suggest AE insulin (with prolonged action) to reach a better control over diabetes type 2. In Albania, the family doctor has the right to

prescribe AE insulin for diabetes type 2 patients, combined with oral antidiabetic, only for those patients that have gone through an acute myocardial infarction, cerebral insult and diabetic gangrene of the foot. The increase in consumption, especially of insulins, may reflect the better level of adherence of the doctors to the excellent guides that recommend intensification of the control to the glycemia levels [The American Association of Clinical Endocrinologists 2002 update; International Diabetes Federation 1999]. The increase in consumption of insulins may also be explained by the fact that the provision of insulin is necessary for a better control of diabetes type 2, in the cases where the diet and the oral hypoglycemic drugs do not result sufficiently.

International comparison of consumption

As shown in Figure 3, the consumption of Insulin in Albania, as compared to other countries, is very low (consumption values presented for all countries, including Albania, are the official values as referred by the respective reimbursement systems).

In Portugal, studies suggest that Insulin and their analogs, have a consumption of 5.3 DDD/TID in 2005 and 15.4 DDD/TID in 2017 exhibited an annual average growth rate that was greater than the increase in the consumption of antidiabetic drugs. Ultimately, insulin and their analogs represented 17.4 % of the total consumption of antidiabetic drugs [Moura, A.M., et al 2021].

Conclusions

There is an increase in Insulin drugs use from HII covering during 2010-2020. The consumption of insulins seems well-equilibrated, a fact evidencing that insulins are taken almost entirely under the reimbursement scheme. Further studies need to be performed in the future to get more details about this topic.

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