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Original Research Article

Use of drugs against osteoporosis in the Baltic countries during 2010–2014

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ABSTRACT

Background and objective: Osteoporosis is a major health threat nowadays. Aging of the population and changes in peoples' lifestyle result in a constant increase in the number of fractures all over the world. Our study aimed at describing the drug utilization pattern and choice of active substances of antiosteoporotic medicines in the Baltic countries.
Materials and methods: Sales data of the antiosteoporotic medicines was obtained from the internet. These are available on the website of medicines regulatory agencies. The World Health Organization (WHO) methodology of Anatomical Therapeutic Chemical (ATC) classification and defined daily dose (DDD) was used to compare the data among countries.
Results: During the study period the consumption of antiosteoporotic medicines was rather stable in all the countries. The overall choice of active substances used to treat osteoporosis is similar in all the Baltic countries but the market shares of substances were different. Estonia stands out with high use of combination product of alendronic acid and colecalciferol. In Latvia the highest consumption was of risedronic acid. In Lithuania the most used active substance in 2014 was ibandronic acid and second was denosumab with 0.8 daily doses per 1000 inhabitants per day (DID) and 25% of the total share.
Conclusions: The differences in consumption of drugs against osteoporosis in the Baltic countries are not very big. The consumption of antiosteoporotic drugs is not to be regarded as sufficient though. The generally low consumption of osteoporotic medicines in the Baltic countries can be attributed to the overall less than EU average wealth of the countries and less than optimal expenditure on healthcare out of the GDP.

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1. Introduction

Osteoporosis is a major health threat nowadays [1–3]. It alters bone architecture leaving them more fragile and more susceptible to fractures [4]. The number of osteoporosis induced fractures is estimated to be 3.5 million annually in the European Union [5]. The main negative health outcome of fractures is loss of quality of life due to pain and disability caused by them [6,7]. Loss of bone mass itself is asymptomatic until a fracture occurs [8] and osteoporosis has clinical and public health relevance only cause of the fractures [9]. Aging of population and changes in people's lifestyle result in a constant increase in the number of fractures all over the world [9,10].

Effective pharmacological treatment options are available (e.g., bisphosphonate and combination with the latter, denosumab, strontium ranelate) [11] that have all been shown to reduce the risk of vertebral fracture, some have also been shown to reduce the risk of non-vertebral fractures and fracture risk at the hip [11,12]. With no single agent demonstrating superiority over another in preventing fractures [13].

Osteoporosis pharmacotherapy needs to be used for a longer period of time and patients need to adhere to treatment to be effective and cost-effective [14,15]. The number of patients who receive treatment within a year after a fragility fracture is less than 20% [16]. Half (50%) of the patients receiving the treatment adherence to it sufficiently and only 35% continue the treatment for at least a year [17,18]. The International Osteoporosis Foundation has declared an increasing need for management strategies to be placed in an appropriate health economic perspective for guideline development and for reimbursement [10,19]. Osteoporosis as a growing chronic health state in the Western world is putting a significant load on both the individual and the society [20].

Our study aimed to describe the drug utilization pattern and choice of active substances of antiosteoporotic medicines in the Baltic countries. Such studies have been carried out before to describe consumption change of drugs against osteoporosis within country [21,22], but none has compared consumption in the Baltic region.

2. Materials and methods

Drug utilization data was analyzed using the Anatomical Therapeutic Chemical (ATC) classification and defined daily dose (DDD) methodology that is developed and maintained by the World Health Organization (WHO) (www.whocc.no). The methodology is used in most of the European countries to serve as the tool for drug utilization research. The national statistics of medicine consumption gathered by governmental bodies is usually based on this to keep track of changes in drug utilization.

An ATC code classifies active substances according to their main indication of use and chemical characteristics. The classification consists of 5 levels with therapeutic areas as the first level and specific active substances as the fifth level. Active substances that affect bone structure and mineralization are mainly included in the group M05B, which is further divided into groups of plain bisphosphonates, bisphosphonate combinations and other drugs affecting bone structure and mineralization (e.g., strontium ranelate and denosumab).

The DDD is the assumed average maintenance dose per day for a drug used for its main indication in adults. It is described as a unit of measurement and not always reflecting the recommended dose or the actual prescribed daily dose. In case of drugs against osteoporosis this is not the case as the doses used do not differ much and the DDD applied by the WHO depict very well the actual doses used. This allows us to evaluate the number of patients receiving the treatment in a period of time rather accurately.

The number of DDDs is reported as per 1000 inhabitants per day (DDD/1000 inhabitants/day or DID). This enables to compare the consumption of medicines in different countries and in different years.

We used the 2015 version of the ATC/DDD classification in the study.

Our study included consumption data from the years 2010 to 2014. Data included in the study was obtained from the internet, published by the authorities gathering medicines consumption data. All the study countries collect the data from wholesalers and it represents medicine sales to pharmacies [23]. Sales data from all the countries cover 100% of consumption of antiosteoporotic medicines in the countries [24–26].

We used comparison of regression lines with STATGRAPHICS Centurion XVII Version 17.1.12 in order to establish differences in trends of medication consumption between the study countries.

3. Results

During the study period the consumption of antiosteoporotic medicines was rather stable in all the countries (Fig. 1).

In Lithuania there was a slight decrease in consumption while in 2010 the consumption was 3.4 DID and in 2014 it was 3.3 DID. In Estonia, the consumption of antiosteoporotic medicines was exactly on the same level in 2014 as it was in 2010, i.e., 4.6 DID. In 2013, the consumption increased to 5.0 DID but an 8% decrease in consumption the following year put it back on 2010 level. In Latvia we can see the only increase in consumption of antiosteoporotic medicines in the Baltic countries during the study period. In 2010 the consumption in Latvia was 4.2 DID and in 2014 it was 5.2 DID which is an overall increase of almost 24%. The consumption was even higher in Latvia in 2012 when 5.6 DID of antiosteoporotic medicines were used (33% more than in 2010). There was a drop in consumption in all the countries during the last year of the study compared to the year before. The decrease was on average 6% with 4.7% in Latvia, 6.2% in Lithuania and 7.8% in Estonia. The annual average change of consumption was +0.3% in Estonia, +5.9% in Latvia, and −0.8% in Lithuania. The trends were not statistically significantly different with a P value of 0.41 between Estonia and Latvia; 0.46, between Estonia and Lithuania; and 0.24, between Latvia and Lithuania.

The choice of active substances used within the country changed little during the study period (Fig. 2), with the only

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