SUMMARY

PHARMACOECONOMICS IN DECISION MAKING

INTRODUCTION

Pharmacoeconomic analyses signify relevance of assessment, registration and reimbursement of drugs. Pharmacoeconomic research involves the evaluation of pharmaceutical products and services, the measuring of its costs in form of given resources, and the outcomes which result at clinical, economic or at societal level.

AIM OF THESIS

Theoretical part

To explore pharmacoeconomics as a science and its application with methods and models.

To focus on Dutch pharmacoeconomic guidelines both from 1999, and new guidelines from 2006.

Practical part

To analyze a specific example and its pharmacoeconomic evaluation. Venous thromboembolism primary prevention after total hip replacement surgery in Europe, from clinical and pharmacoeconomic point of view, was presented

To evaluate the use of the methodological national guidelines, from 1999, and their adherence to published literature in The Netherlands.

THEORETICAL PART

Pharmacoeconomics and Outcomes Research

Pharmacoeconomics is a collection of techniques used in evaluation not only of pharmacotherapy, in which it is a point of interest, but also in evaluating surgical procedures, medical devices or clinical servicesOutcomes Research is the process that evaluates different therapies or drug regimens in order to measure the extent to which a goal of therapy or desirable outcome can be reached. Outcomes are economic, clinical, and humanistic.

Types of pharmacoeconomic studies: prospective, retrospective and model, and analyses used in pharmacoeconomic research as CMA, CBA, CEA and CUA.

It is also important to identify different types of cost with implementation of CER.

Discounting is a regular procedure throughout all economic analyses. For example, for The Netherlands, discount rates of 4% for money and 1.5% for health were estimated in the Dutch context and implemented from 2006.

In decision making, pharmacoeconomics is used by government in the evaluation of medical intervention and is regular practice in many European countries.

Use of different statistical models in reading CEA is crucial for valid evaluation. It is straightforward to calculate confidence intervals for each of the cost and effect differences, ΔC and ΔE, using standard methods, and these intervals can also be plotted on the CEP.

Epidemiology is complementary to the economics; it encompasses rubrics ranging from health services research to Pharmacoepidemiology, Outcomes research and Clinical epidemiology. The ideal clinical trial is that it is randomized and double-blinded.

Sensitivity analyses provide reviewers with an approach to testing how robust the results of the review are.

Modeling in pharmacoeconomic research is crucial nowadays. There are two types of models, Markov model and MCMC.

In The Netherlands, in 1999, the guidelines for pharmacoeconomic research were presented. Since January 2005, the Ministry of Health in the Netherlands implemented the use of pharmacoeconomics as a supplementary aspect in the evaluation for drug reimbursement. Currently, methodological and procedural ones are being separated in distinct booklets. The new guidelines were assessed on 1st April 2006 and are only 11.

PRACTICAL PART

Thromboprophylaxis in total hip-replacement surgery in Europe: acenocoumarol, fondaparinux, dabigatran and rivaroxban

In Europe, by the year 2020, the demand for THR is expected to increase by 25–50% compared with current incidence, primarily owing to aging of the population.

Methods: In this review, we searched the Pub Med database (English language) for clinical trials using any of the following agents after hip-replacement surgery: acenocoumarol, fondaparinux and direct oral inhibitors. Given the European perspective of our analysis, such trials had to also be relevant for the specific European clinical practices, in particular with respect to the timing of LMWH and fondaparinux (this did, for example, imply that the European Pentasaccharide Hip Elective Surgery Study (EPHESUS) would be included, whereas the North American-based PENTATHLON 2000 study was not).

Results: Studies have shown that during the first 10 days, low molecular heparins started preoperatively or fondaparinux commenced postoperatively are preferred over the vitamin K antagonists.

Expert opinion and future recommendations: Direct oral inhibitors are possibly the drugs of the future. One of the most interesting new compounds is dabigatran, which has been proven effective; liver enzyme elevation has not been observed to the same extent as ximelagatran and, therefore, there is a strong possibility that it could be used routinely in clinical practice to prevent DVT following major orthopedic surgery.

In: Future Drugs section on Expert Review of Pharmacoeconomics & Outcomes research. February 2007, Vol. 7, No. 1, Pages 49-58.

Application of national guidelines to pharmacoeconomic research in the Netherlands

Objective: This study investigates the application of the Dutch national guidelines to pharmacoeconomic studies in the Netherlands.

Methods: The review covers all Dutch pharmacoeconomic studies that were published in English during 2003–2004. The databases used were MEDLINE and EMBASE. The search used the

terms ''cost (-) effectiveness'', ''pharmaco (-) economic(s)'' and ''(the) Netherlands''. Nine methodological guidelines were selected for investigation with respect to their application to pharmacoeconomic studies.

Results: From 56 studies identified only 13 studies satisfied the inclusion criteria.

An appropriate time period for analysis was applied in all studies (100%), as well as an incremental analysis. Sensitivity analysis was present in 11 studies (85%). In 10 from 13 studies (77%) following three criteria were taken into account: societal perspective, discounting (of costs, benefits and health gains), and efficacy versus effectiveness distinction. LYGs or QALYs as effectiveness expression were used in 7 (54%) and reference prices in 9 studies (69%). Adequate subgroup analyses were presented in only 5 studies (38%).

Conclusions: It was found in this review that the application of some of the Dutch guidelines for pharmacoeconomic research to pharmacoeconomic studies were favorable. Main changes are needed in areas of suitable subgroup analysis and utilization of the preferred outcomes life-years gained (LYGs) or quality-adjusted life years (QALYs).

In: Farmakoekonomika a lieková politika, ročník 3, 2007, číslo 1.

(Pharmacoeconomics and Drug Policy, year 3, 2007, No. 1, Pages 33-40).

CONCLUSION

The aim of this doctoral thesis was to explore pharmacoeconomics and its use in decision making process. The example of THR was chosen due to increased future need for it as well as the added cost for society secondary to an aging population in Europe. From the presented clinical and economic data, it is impossible to make evidence-based statement on the best available cost-effective strategy for THR prophylaxis; all the given options are speculative. In the final part, research of pharmacoeconomic guidelines was focused on Dutch guidelines from 1999, but herein new guidelines are presented in this thesis.