

28th European Diabetes Congress

July 17-18, 2019 | Edinburgh, Scotland

Business model "Decision tree" as a method of rational choice of combined therapy of type 2 diabetes mellitus

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Type 2 diabetes mellitus (T2DM) is an important medical and social problem. The rational choice of pharmacotherapy should take into account the results of pharmacoeconomic researches using business model "Decision tree". The purpose of the research was the graphical construction of a model "Decision tree" with results of the pharmacoeconomic investigations. The research materials: 1792 medical histories of the inpatients with type 2 DM who were treated at the Vinnytsya regional endocrinology clinic, endocrinological department of Khmelnytsky hospital and Ternopol regional hospital.

Research Methods: frequency analysis; ATC/DDD-methodology; cost-effectiveness analysis; sensitivity analysis; mathematical modeling. Results and discussion. The frequency analysis showed that the most frequently used combined schemes of pharmacotherapy were: Metformin + glimepiride – in 45% of cases, metformin + gliclazide – in 14.5 % of cases, metformin + glibenclamide – in 6.1%. When comparing the indicators of groups of patients to whom combined therapy were prescribed it was found that the patients with metformin + glibenclamide were significantly older, with the largest disease duration of T2DM, with the highest body mass index (BMI) and lowest levels of fasting plasma glucose (FPG) on admission ($p > 0,05$). When comparing the indicators of groups of patients who received combined therapy of metformin + glimepiride and metformin + gliclazide it was found significantly longer duration of disease in the patients with the scheme metformin + gliclazide and more FPG on admission in the patients with scheme metformin + glimepiride, it was not found significant differences in other analyzed indicators. Only direct costs are taken into account.

The cost of treatment was estimated on the basis of the average price list of wholesale state medicines as on 11.11.2018. Sensitivity analysis was performed to determine the stability of results. ATC/DDD-methodology showed that the cost for DDD of combination metformin + glimepiride ranges from 4.75 to 13.6 UAH, metformin + gliclazide – from 4.10 to 13.34 UAH, metformin + glibenclamide – from 2.22 to 11.67 UAH. It has been found that clinical efficacy of combination metformin + glimepiride is 50.3%, metformin + gliclazide – 59.1%, metformin + glibenclamide – 49.1%. Cost-effectiveness analysis showed that the cost of costs-efficiency ratios CER for metformin + glibenclamide ranges from 44.81 to 225.72 UAH, metformin + gliclazide – from 66.37 to 237.68 UAH, metformin + glimepiride – from 94.43 to 270.38 UAH, in the context of minimal and maximal price of the generics. Based on the results of pharmacoeconomic research, we have compiled a graphical model of the "Decision Tree".

Conclusions.: According to the graphical construction of the "Decision tree" model it was shown that the metformin + glibenclamide scheme has the greatest advantage.

Key words: type 2 diabetes mellitus, cost-effectiveness analysis, "Decision tree" model

Biography

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