

Abstract

Background and Aim: Diabetes is the most common chronic metabolic disease. The disease is characterized by abnormalities in the metabolism of carbohydrates, proteins and fats. The epidemic of diabetes and the growing prevalence of it in the future, turns this disease into a public health crisis in the world. The prevalence of diabetes in developing countries is significant. People with type 2 diabetes can lower their blood sugar levels by choosing the right diet and exercise, but many of these people need insulin injections or oral therapies, which are prescribed to the patient depending on the doctor. Relatively new drugs, empagliflozin and sitagliptin, which are common therapies, are FDA-approved drugs used to treat type 2 diabetes and are used in the European Union and the United States. The aim of this study was to evaluate the technology of empagliflozin in comparison with sitagliptin in terms of safety, efficacy and cost-effectiveness and analysis of ethical and organizational aspects.

Materials and Methods: The present study was conducted in three phases. For the first phase, a systematic review study was performed to evaluate the safety and efficacy of empagliflozin and sitagliptin. For this purpose, PubMed, Scopus, Web of Science, Embase and Cochrane databases were searched until March 11, 2020. The 2010 Consort Checklist was used to evaluate the quality of the articles. STATA software version 13 was used for meta-analysis. In the second phase, the cost-effectiveness method was used to evaluate the economic dimension of technology. For cost-effectiveness analysis, inpatient costs for drug side effects were calculated and compared in standard costing. This study was performed from the insurer's point of view and the model used was the decision tree. TreeAge software was used to analyze the sensitivity of the cost-effectiveness analysis. To evaluate the ethical, organizational and legal aspects of this technology using a qualitative method, endocrinology was performed by purposeful sampling, using semi-

structured interviews to reach saturation.

Results: For meta-analysis, 3 studies met the inclusion criteria. The results of meta-analysis showed that empagliflozin was more effective than sitagliptin and placebo for the consequences of lowering hemoglobin A1c, fasting blood sugar, systolic blood pressure and weight loss. Also, based on the side effects of drug side effects, empagliflozin did not alter hyperglycemia compared to sitagliptin and placebo, but in rare cases, it can cause urinary tract infections and mild genital infections. Be. The average cost of treatment for the side effects of empagliflozin compared to sitagliptin during the three months was 26281000 Rials and 23444000 Rials, respectively. Due to the similarity of the results, the cost minimization methodology was used to analyze the cost-effectiveness. And due to the lower price of sitagliptin compared to empagliflozin, judging sitagliptin was the dominant strategy. From an organizational and ethical point of view, the use of empagliflozin resulted in a better outcome for the treatment of diabetes.

Conclusion: The results of this study showed that in comparison with sitagliptin 100, both doses of empagliflozin 10 and 25 mg and in most cases empagliflozin 25 mg are effective for use in patients with type 2 diabetes. In the field of economic evaluation, the balance between the cost differences of the two drugs was in favor of the drug citagliptin and showed the cost-effectiveness of this drug. In the ethical evaluations, no issues were found that were contrary to the ethical principles regarding the use of drugs. In the organizational evaluation section, the results were obtained that if there is a relationship between the Ministry of Health, the insurance organization and pharmaceutical companies, access and use of these drugs by patients will be facilitated and as a result we will see a reduction in heart and kidney failure in patients. According to these results, it is reasonable to insure the drug and use it in medical centers in Iran.

Keywords: Empagliflozin, Sitagliptin, type 2 diabetes, Health Technology Assessment



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Title

**Health Technology Assessment of Empagliflozin Compared to
Citagliptin in the Treatment of Patients with Type 2 Diabetes**

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Thesis No:

Date (2020,

2021)

References