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Economic Evaluation

Cost-Effectiveness Analysis of Different Methods of Treatment of Tubal Ectopic Pregnancy in the South of Iran

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ABSTRACT

Objectives: The aim of the study was to evaluate the cost-effectiveness of different methods of treating tubal ectopic pregnancy in the south of Iran.

Methods: This study was an economic evaluation that analyzed and compared the cost-effectiveness and cost utility of 3 treatment methods, including single-dose methotrexate, double-dose methotrexate, and surgery in patients with tubal ectopic pregnancy. In this study, a decision tree model was used. The outcomes included in the model were the percentage of successful treatment and the average utility score of each treatment method. The study was conducted from the social perspective, and a one-way and probabilistic sensitivity analysis was performed to measure the effects of uncertainty.

Results: The incremental cost-effectiveness ratio of surgery compared with single-dose methotrexate was positive and equal to $5812 purchasing power parity; moreover, the results of one-way analysis showed the highest sensitivity toward the effectiveness of single-dose methotrexate. Scatter plots also revealed that surgery in 82% and 96% of simulations was at the acceptable region compared with a single-dose and double-dose methotrexate, respectively and was below the threshold. It was identified as a more cost-effective strategy. Furthermore, the acceptability curves showed that in 81.4% of simulations, surgery was the most cost-effective treatment for thresholds less than $20 950 purchasing power parity.

Conclusions: On the basis of the results of this study, surgery can be used as the first line of treatment for ectopic pregnancy. In addition, the best drug strategy was single-dose methotrexate because this strategy reduced costs and increased treatment success and quality-adjusted life-years compared with double-dose methotrexate.

Keywords: cost utility, cost-effectiveness, economic evaluation, ectopic pregnancy, methotrexate, surgery.

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Introduction

Because the fifth goal of the Millennium Development Goal is to improve the health of mothers, providing care services for vulnerable groups of the community is of particular importance.[1] Ectopic pregnancy is one of the most important causes of mortality and disabilities in women of reproductive age.[2] According to the Center for Disease Prevention and Control, this problem occurs in about 2% of pregnancies, and this small proportion accounts for about 6% of pregnancy-related deaths.[3] The incidence of this disease in Iran is estimated to be 0.26%.[4] The rate of maternal mortality per thousand live births in the country in 2012 and 2013 was 19.9% and 19.8%, respectively, and ectopic pregnancy was one of the causes of mortality.[1] The incidence of this disease has increased significantly in the last century, but the rate is currently relatively stable. The increase in the past century may be attributed to the rise in using diagnostic technologies, such as high sensitivity ultrasounds, increased prevalence of sexually transmitted diseases, assisted reproductive techniques, and the use of ovarian stimulants.[5] So far, uterine tubes have been the most common site of abnormal implantation, which account for 98% of ectopic pregnancies.[2] Ectopic pregnancy may damage the uterine tube or lead to infertility in the future,[6] and 10% to 12% of secondary infertility occurs as a result of such diseases.[1] Infertility as a biologic, psychologic, and social crisis can threaten the health of infertile couples.[7] The rapid progress in medical equipment has made it possible to detect ectopic pregnancy by measuring the β-human chorionic gonadotrophin (β-hCG) subtypes. The measurement of β-hCG is a precise, noninvasive, and accurate method for diagnosis.[2] Methotrexate, as a safe and effective medication, is suggested to be used at different dosages for treating ectopic pregnancy; it is comparable with surgery, rate of success, and rate of future pregnancy. Laparoscopy or laparotomies are 2 standard methods used for the treatment of an ectopic pregnancy. Nonetheless, the use of these methods depends on the size and location of the ectopic mass and the hemodynamic stability of the patient.

pregnancies and their prices are the same throughout the country, the results of this study can be generalized to other provinces and the whole country. Nonetheless, to generalize the results of this study to other countries, it is necessary to address different issues, such as epidemiology of the disease, demographic structure, availability of resources, prices, evaluation of outcomes by individuals, thresholds, and the use of various indicators of effectiveness in different studies that may affect the results of the study. Therefore, one must be cautious in generalizing the results to other countries.

Conclusions

Overall, on the basis of the results of this study and considering the ICER and cost-utility ratio, surgery is a superior treatment strategy and can be used as a high-priority method, as compared with single-dose and double-dose methotrexate. In addition, the best drug strategy was single-dose methotrexate. Furthermore, because their use as the first line of treatment reduces the duration and helps to manage costs, as compared with double-dose methotrexate, it is suggested that surgery and/or single-dose methotrexate can be used as the first line of treatment for ectopic pregnancy to reduce the burden of disease and financial burden within the community.

Supplemental Material

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