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An initial health economic evaluation of pharmacogenomic testing in patients treated for childhood cancer with anthracyclines.

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Abstract

BACKGROUND: Anthracyclines are a class of highly effective chemotherapeutic drugs commonly used to treat cancer patients. Anthracyclines, however, are associated with the development of serious adverse reactions, including anthracycline-induced cardiotoxicity (ACT). It is not possible, within current practice, to accurately individualize treatment to minimize risk.

PROCEDURE: Recently, genetic variants have been associated with the risk of ACT in children. Building on these findings and the related genetic test, a predictive model was developed which classifies pediatric patients by their risk of developing ACT. We assessed the value of this ACT-predictive risk classification in addressing ACT.

RESULTS: With current care, the estimated average lifetime cost of ACT is $8,667 per anthracycline-treated patient and approximately 7% of patients are expected to die from ACT. The projected impact of the information from the new predictive model is a 17% reduction in the risk of mortality from ACT and savings of about 6%: lives saved and lower costs.

CONCLUSION: The newly identified genetic variants associated with the risk of ACT provide information that allows a more reliable prediction of the risk of ACT for a given patient and can be obtained at a very moderate cost, which is expected to lead to meaningful progress in reducing harm and costs associated with ACT.

KEYWORDS: anthracyclines; cardiotoxicity; dexrazoxane; pharmacogenomics testing

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