The Hospital for Sick Children
Technology Assessment at Sick Kids (TASK)

EXECUTIVE SUMMARY

A COST-EFFECTIVENESS ANALYSIS OF MATERNAL GENOTYPING TO GUIDE TREATMENT FOR POSTPARTUM PAIN AND AVERT INFANT ADVERSE EVENTS

Authors:
Myla E. Moretti, PhD
Research Associate, Clinical Trials Support Unit, The Hospital for Sick Children, Toronto

Daniella F. Lato, BSc
Research Assistant, Motherisk Program, The Hospital for Sick Children, Toronto

Wendy J. Ungar. MSc, PhD
Senior Scientist, Child Health Evaluative Sciences, The Hospital for Sick Children, Toronto
Professor, Health Policy, Management & Evaluation, University of Toronto

Howard Berger, MD
Head, Maternal Fetal Medicine, St. Michael's Hospital, Toronto
Adjunct Scientist, Keenan Research Centre of the Li Ka Shing Knowledge Institute
Assistant Professor, Health Policy, Management and Evaluation, University of Toronto

Gideon Koren, MD
Director, Motherisk Program, The Hospital for Sick Children, Toronto
Senior Scientist, Child Health Evaluative Sciences, The Hospital for Sick Children, Toronto
Professor, Faculty of Medicine, The University of Toronto

Shinya Ito, MD
Head, Division of Clinical Pharmacology & Toxicology, The Hospital for Sick Children
Senior Scientist, Physiology & Experimental Medicine, The Hospital for Sick Children, Toronto
Professor, Faculty of Medicine, The University of Toronto

Report No. 2015-01
Date: January 20, 2015

Available at:
http://lab.research.sickkids.ca/task/reports-theses/

ACKNOWLEDGEMENTS

This work was supported by scholarships from the Ontario Student Opportunity Trust Fund – Hospital for Sick Children Foundation Student Scholarship Program, the Ontario Graduate Scholarship Program, the Institute of Health Policy, Management and Evaluation and the Canadian Federation of University Women.

We wish to thank our external reviewers Dr. Martin Offringa, MD, PhD, The Hospital for Sick Children, Toronto and Dr. Stavros Petrou, PhD, Warwick Medical School, The University of Warwick for valuable feedback.

We wish to acknowledge the many patients who, despite facing the challenges of new motherhood, graciously gave their time to participate in this research project.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

EXECUTIVE SUMMARY

Background

The maternal and infant benefits of breastfeeding are numerous, however maternal exposure to medications during lactation raises concerns of infant exposure and may be an impediment to breastfeeding. Recent concerns about the safety of codeine, an analgesic commonly used after delivery, have arisen. Evidence suggests that mothers with an ultrarapid metabolizer phenotype may put their infants at risk for adverse events by producing more active metabolite, which is excreted into milk. Pharmacogenetic screening may be a valuable tool to identify such mothers, and avert adverse events.

Objectives

The objective of the study was to determine the incremental costs of genotyping to avert neonatal adverse events during maternal pharmacotherapy.

Methods

A cost effectiveness analysis to determine the incremental costs of genotyping to guide codeine therapy compared to standard care to avert adverse events was performed. The base case was a prenatal patient whose metabolizer status was unknown, but who may require codeine analgesia after delivery. Parameter estimates and costs were ascertained from a concurrent clinical study, from the literature and expert opinion.

Results

Pharmacogenetic screening resulted in a cost of $9,997 per adverse event averted or $2,173 per infant symptom day averted, when compared to standard care. The results were not sensitive to most variables in one way analysis, with the exception of the costs of a hospital admission. This study was limited by a small number of trials from which parameter estimates could be extracted and the very small number of adverse events reported in infants in the literature.

Conclusions

Although genotyping to guide pharmacotherapy was not cost saving, the cost to avert an infant adverse event may represent good value for money. It is not yet known whether implementation would be clinically viable, however these findings will have implications for new mothers and their health care providers world-wide.