

eLi12: AN EARLY HEALTH ECONOMIC ASSESSMENT ON A NEW METHOD TO ESTIMATE 12-HOUR LITHIUM LEVELS

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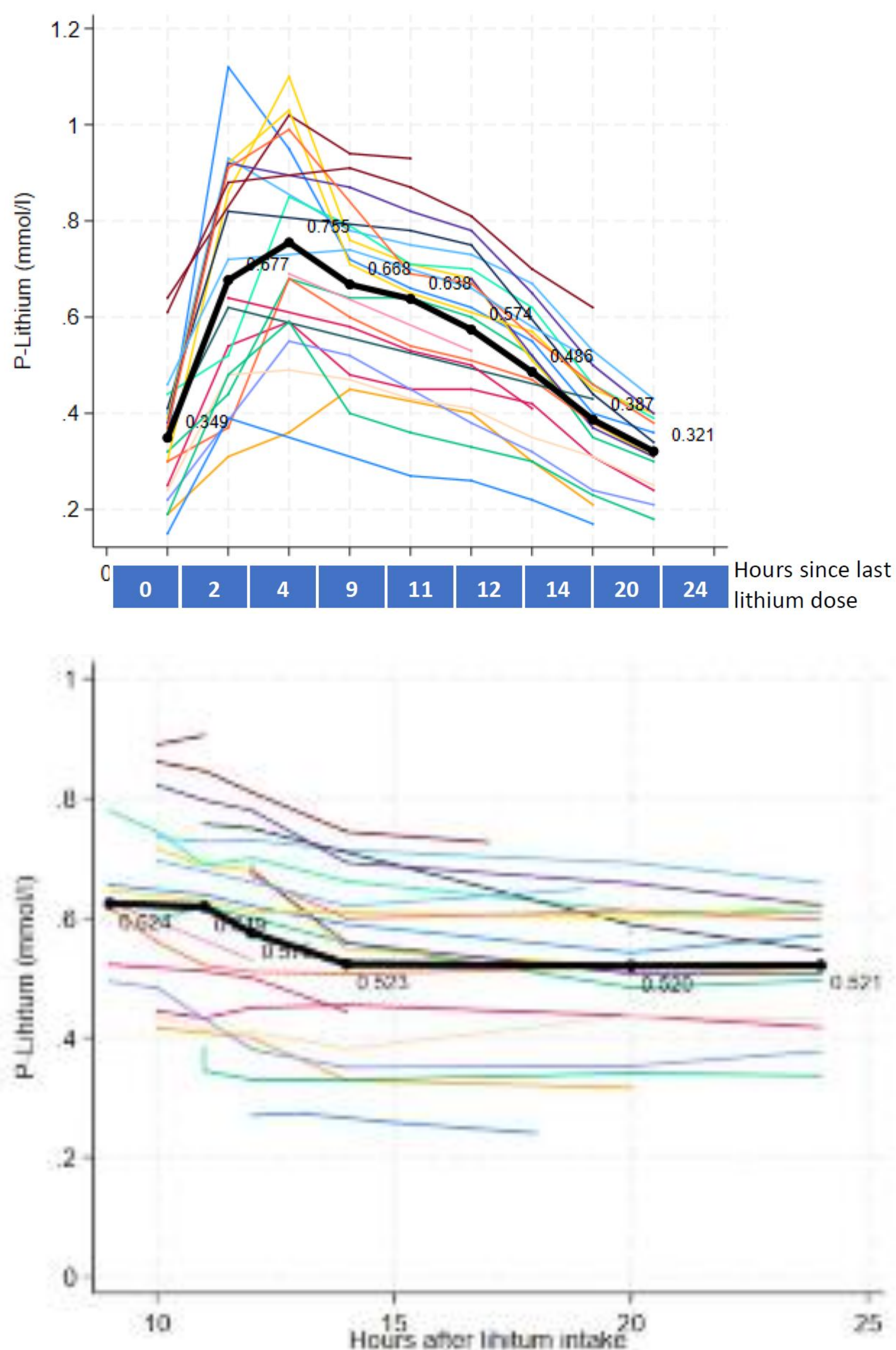
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OBJECTIVES

Accurate monitoring of blood lithium levels is crucial for optimal dose adjustment in patients with bipolar affective disorder. Current guidelines recommend measuring lithium levels 12 hours after the last dose. However, in clinical practice, over 75% of lithium blood tests are taken with wrong timing. This mistiming increasing the risk of inappropriate lithium dose adjustments and adverse side effects.

A new method, eLi12, evaluated in a proof-of-concept study, shows potential in estimating 12-hour lithium levels independent of blood test timings. Fig. 1 presents lithium levels over 24 hours after the last lithium dose and eLi12 levels on the same patients. Early economic evaluations, even without a solid evidence base like a randomized clinical trial, may indicate the value of emerging technologies and inform further research and development decisions by addressing uncertainties and potential benefits. The purpose of this study was to conduct an early economic evaluation of eLi12 in a Danish healthcare setting.

Fig 1. Lithium levels and eLi12 levels in 23 patients on a stable dose.



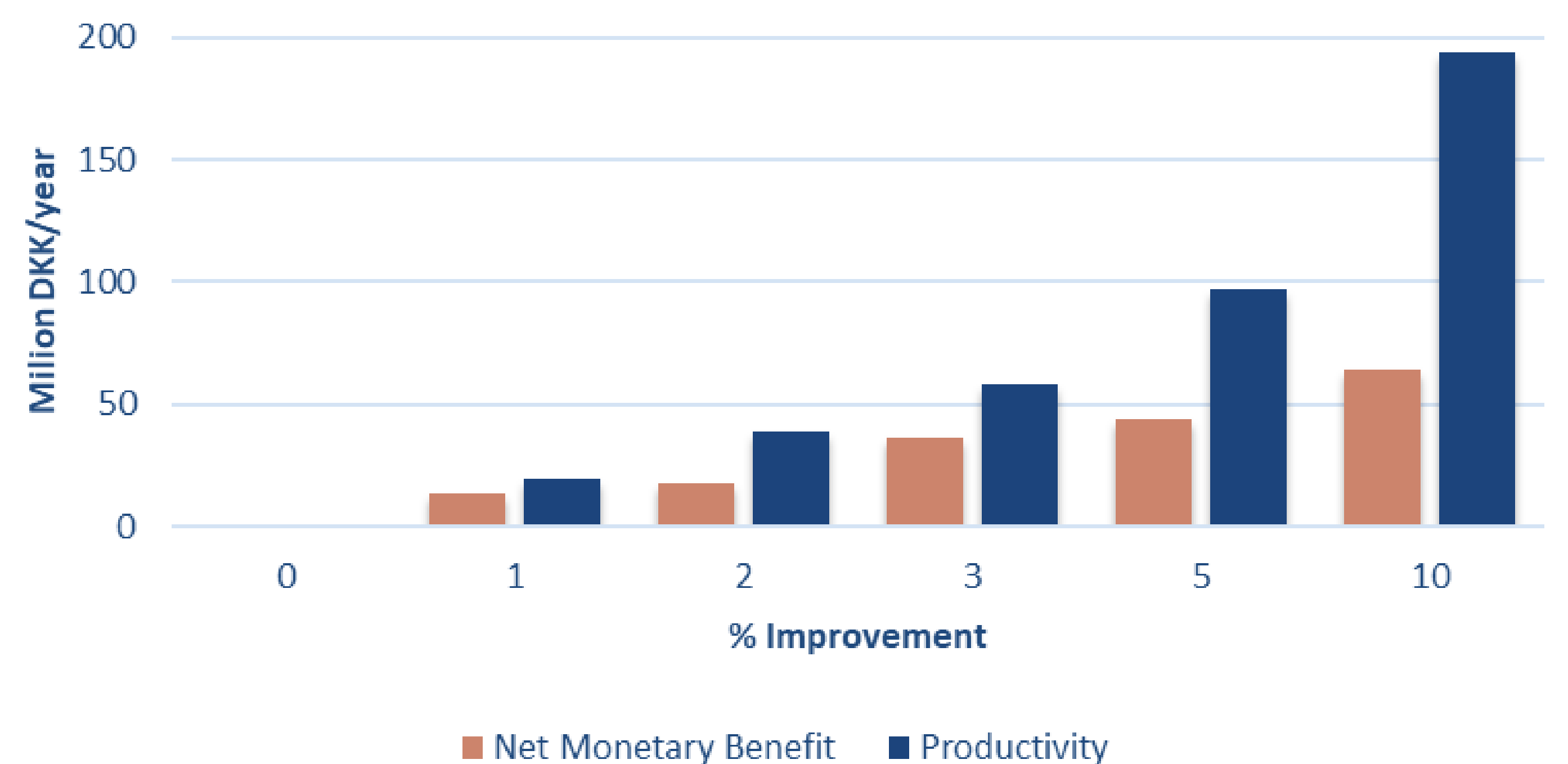
METHODS

An interactive economic model was developed to present outcomes in monetary and physical units, including user-defined sensitivity analyses. Outcomes of interest included yearly hospitalizations, intoxications, suicides, mood episodes, productivity loss, quality-adjusted life years lost, and net monetary benefit. The model utilized the best available evidence from literature and expert inputs on the efficacy, safety, and associated costs. A societal perspective was adopted, considering both direct and indirect costs. The model incorporated various estimates of the potential improvements in lithium treatment with eLi12 (ranging from 1%-15% improvement in metrics such as mood episodes, suicides, and hospitalizations) to address the uncertainties and assess the potential impact of eLi12.

RESULTS

The interactive early economic model indicates potential cost savings for the healthcare sector, along with reduced productivity costs and patient benefits with eLi12. The net monetary benefit was estimated to be between DKK 1,465–10,360 per patient annually (Fig 2). A major uncertainty was the patient's ability to accurately record the precise time of lithium consumption.

Fig 2. Net Monetary Benefit (monetary value of health benefits plus the expected net savings) and reduction in productivity costs (related to bipolar disorder due to improved lithium treatment with eLi12) of implementing eLi12 in Denmark depending on the potential improvements. The percentages represent estimates of the potential improvements of lithium treatment.



CONCLUSION

Early economic evaluation is a valuable tool for supporting innovation in clinical research groups during the initial stages of medical device development. This study suggests that implementing eLi12 can result in significant cost savings, supporting the need for an implementation study and further investment.