Electrocardiographic Screening for Prolonged QT Interval to Reduce Sudden Cardiac Death in Psychiatric Patients: A Cost-Effectiveness Analysis

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Importance
Sudden cardiac death is a leading cause of mortality in psychiatric patients. Long QT (LQT) is common in this population and predisposes to Torsades-de-Pointes (TdP) and subsequent mortality.

Objective
To estimate the cost-effectiveness of electrocardiographic screening to detect LQT in psychiatric inpatients.

Design, Setting, and Participants
We built a decision analytic model based on a decision tree to evaluate the cost-effectiveness and utility of LQT screening from a health care perspective. LQT proportion parameters were derived from an in-hospital cross-sectional study. We performed experts’ elicitation to estimate the risk of TdP, given extent of QT prolongation. A TdP reduction of 65% after LQT detection was based on positive drug dechallenge rate and through adequate treatment and electrolyte adjustments. The base-case model uncertainty was assessed with one-way and probabilistic sensitivity analyses. Finally, the TdP related
mortality and TdP avoidance parameters were varied in a two-way sensitivity analysis to assess their effect on the Incremental Cost-Effectiveness Ratio (ICER).

Main Outcomes and Measures
Costs, Quality Adjusted Life Year (QALY), ICER, and probability of cost effectiveness thresholds ($10 000, $25 000, and $50 000 per QALY).

Results
In the base-case scenario, the numbers of patients needed to screen were 1128 and 2817 to avoid one TdP and one death, respectively. The ICER of systematic ECG screening was $8644 (95%CI, 3144-62 498) per QALY. The probability of cost-effectiveness was 96% at a willingness-to-pay of $50 000 for one QALY. In sensitivity analyses, results were sensitive to the case-fatality of TdP episodes and to the TdP reduction following the diagnosis of LQT.

Conclusion and Relevance
In psychiatric hospitals, performing systematic ECG screening at admission help reduce the number of sudden cardiac deaths in a cost-effective fashion.