Health Technology Assessment of Low cost portable ventilator

HEALTH TECHNOLOGY ASSESSMENT IN INDIA
KALAM INSTITUTE OF HEALTH TECHNOLOGY-VIZAG

CONTEXT OF THE STUDY

- The Covid-19 crisis highlighted the lack of adequate ventilators in healthcare systems all over the world, leading to panic due to lack of evidence on the clinical effectiveness of ventilation systems needed for acute respiratory failure and other diseases.
- This HTA was an initiative to inform the policymakers on the same issue and help the exchequer in allocating resources optimally and make informed investment decisions on scaling up the most appropriate respiratory support devices.
- As poor choices lead to inappropriate use or non-use of medical devices and a waste of resources.

SUMMARY OF FINDINGS

- This new LCPV can be a promising lifesaving intervention in epidemics like the current COVID-19 and other disaster scenarios.
- Taking the willingness to pay threshold as GDP per capita per month and assuming non-inferiority in terms of clinical effectiveness, the new ventilator turns out to be cost-effective.

INTRODUCTION

Acute respiratory failure, and the need for ventilation, remains one of the most common reasons for admission to the intensive care unit (ICU). The burden of acute respiratory failure is high in terms of mortality and morbidity as well as the cost of its principal treatment of ventilation. A medical ventilator can be a lifesaving as it is used when a person can't breathe properly on its own. Ventilators can be of two types non-invasive ventilator (NIV) and invasive ventilator (IV). Mechanical ventilation is used to treat 30–40% of patients admitted to critical care. The growing prevalence of respiratory diseases and COVID-19 pandemic, low-cost portable ventilators were introduced in the healthcare system. As we know India has limited number of ICU beds, and using a low-cost ventilator for patients would reduce the burden on healthcare system. Utility of ventilators in homecare, ambulatory and emergency medical services, are driving the growth of the portable ventilator segment in the market.

SUMMARY OF RESEARCH

As part of this technical consultation, the current study was undertaken to assess the clinical and cost effectiveness on the use of non-invasive ventilation (NIV) in acute respiratory failure (ARF) and other diseases. Based upon the available clinical evidence, we constructed a decision analytic tree, Incremental Cost Effectiveness Ratio per QALY gained was calculated. A rigorous sensitivity analysis was undertaken to check the robustness of our analysis.

RESEARCH FINDINGS

Systematic review and meta-analysis on non- invasive ventilator verses mechanical invasive ventilator was performed to evaluate the clinical effectiveness of the ventilator. The forest plot showed Low-cost portable. ventilator (LCPV) was reducing mortality by 40% when compared to mechanical invasive ventilation.

We also performed economic modelling and calculated cost-saving per Quality Adjusted Life Years (QALYs), assuming non-inferiority, the cost- savings if this ventilator is used for domiciliary purpose.

This intervention is cost-effective at Rs 4845/- per QALY gained, while the standard of care is cost- effective at Rs 4859/- per QALY gained. The difference in Incremental Cost Effectiveness Ratio between the other non-invasive ventilator and the new ventilator turns out to be approximately Rs. 14 per QALY gained per patient. The forest plot showed Low-cost portable. ventilator (LCPV) was reducing mortality by 40% when compared to mechanical invasive ventilation.

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POLICY RECOMMENDATIONS

- This LCPV may be particularly useful in the current situation of COVID-19 pandemic to overcome ventilator shortage and resource constraints in India.
- LCPV can be used for the patients requiring long term ventilation.
- Ease of accessibility of the device makes it useful in emergency conditions and it can be used in ambulance also.
- Introduction of LCPV in the Indian healthcare system appears to be fiscally sustainable.
- Future research should be considered as data was very limited on which this analysis was performed.

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REFERENCES

HTA on Low-cost portable ventilator (LCPV) by Kalam Institute of Health Technology, Vizag, Andhra Pradesh.