Health Technology Assessment for Vagal Nerve Stimulation intervention

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Policy Brief

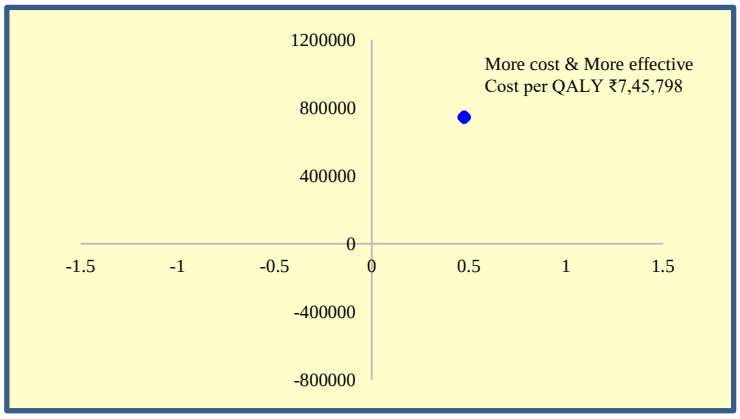
Summary

Epilepsy affects a significant portion of the population, with some patients being resistant to conventional Anti-Seizure Medication (ASM), termed Drug-Resistant Epilepsy (DRE). Vagus Nerve Stimulation (VNS) has emerged as a promising adjunctive therapy for DRE. This Health Technology Assessment (HTA) study aims to evaluate the cost-effectiveness and clinical efficacy of VNS as an adjunctive treatment to ASM for refractory epilepsy in India. A systematic review and meta-analysis revealed that VNS is clinically effective, with approximately 48% of patients experiencing >50% seizure reduction based on data from 23 studies. With respect to cost-effectiveness to India, VNS as an adjunct to ASM for the treatment of DRE demonstrated with an estimated incremental cost effectiveness ratio (ICER) of ₹745,798. This indicates that the intervention is more costly and more effective. In summary, this means that while VNS is a successful treatment that can reduce seizures which is required for only the small proportion of DRE patients, it is also expensive and not easily affordable. Therefore, VNS cannot be considered as the most cost-effective option for a broader population.

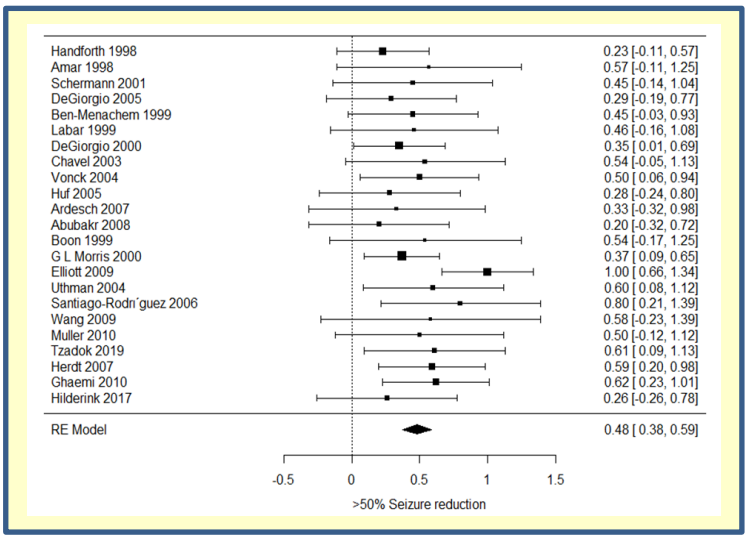
Problem Statement

Neurological disorders pose a significant global health challenge, contributing to disability and mortality rates.[1,2] Epilepsy, among these disorders, affects millions worldwide, with India bearing a substantial burden.[2] Despite the availability of Anti-Seizure Medication (ASM), a considerable proportion of patients remain refractory to treatment, termed Drug Resistant Epilepsy (DRE). Invasive treatments like surgery carry risks, leaving a treatment gap for those with DRE. Vagus Nerve Stimulation (VNS) offers a promising alternative, but its adoption in India remains limited. This highlights the need to address the challenges of DRE management, including assessing the clinical efficacy and cost-effectiveness of VNS, and understanding its level of adoption in India. Furthermore, the socioeconomic factors exacerbate the treatment gap, with poverty and inadequate health infrastructure contributing to disparities in epilepsy management.[3] While ASM is the cornerstone of epilepsy treatment, its efficacy is limited in a significant proportion of patients. Invasive interventions such as hemispherectomy and temporal lobectomy are options for some, but they come with considerable risks and are not suitable for all patients. VNS emerges as a less invasive neuromodulation therapy, yet its utilization remains low in India, necessitating a deeper understanding of its feasibility and acceptance within the healthcare system.

Cost-effectiveness Plane



Forest plot depicting effect size



Conclusion

In conclusion, though the systematic review and meta-analysis have shown VNS as a clinically effective adjunctive treatment for treating DRE, the cost-effectiveness analysis of VNS+ASM treatment for drug-resistant epileptic patients reveals that, it comes at a high cost. The ICER value of ₹7,45,798 for gaining a QALY indicates that it may not be the most financially feasible option for a wider population. While VNS remains a valuable treatment for those who require it, its high expense makes it less affordable and may limit its widespread implementation in India.

The policy brief is based upon the Health Technology Assessment of "Health Technology Assessment for Vagal Nerve Stimulation intervention" and can be found on the link: https://dhr.gov.in/sites/default/ files/

Key Messages

- *Explore strategies to improve the affordability of VNS for DRE patients in India, such as government subsidies or insurance coverage.*
- *Conduct further research to refine the cost-effectiveness analysis of VNS compared to other treatment modalities, considering long-term outcomes and potential cost savings.*
- *Implement targeted education and awareness campaigns to increase understanding of VNS among healthcare professionals and patients, promoting informed decision-making regarding treatment options.*
- *Foster collaborations between healthcare providers, policymakers, and industry stakeholders to address barriers to the adoption of VNS and develop innovative solutions for sustainable implementation.*
- *Continuously monitor and evaluate the real-world impact of VNS implementation on patient outcomes, healthcare resource utilization, and economic burden to inform evidence-based decision-making and policy adjustments.*

References

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