ISPOR Europe 2024, Barcelona, Spain
17-20 November 2024

EE574

Cost-Consequences Analysis of the Use of TYRX Antibacterial Envelope in Patients Undergoing Device Replacement Procedures in Türkiye

Ozturk F[1], Kockaya G[1], Ozturk C[2], Turgut G[2], Saritas A[2], Ozet SA[2], Copur F, Okcun S[1]

1: ECONiX Research, Istanbul, Türkiye, 2: Medtronic, Istanbul, Türkiye

INTRODUCTION AND OBJECTIVE

According to the relevant clinical trial in patients having reoperations with cardiac resynchronization therapy with a defibrillator or pacemaker, the use of Tyrx was associated with a 47% lower risk of major and minor device-related infections due to cardiac implantable electronic devices within a 24-month period (Table 2). The study aimed to conduct cost-consequences analysis of Tyrx antibacterial envelope therapy compared to standard care for infection control in high-risk patients undergoing device replacement procedures in Türkiye, from the perspective of the Social Security Institution (SGK), the national reimbursement agency.

MATERIAL AND METHODS

A cost-consequences analysis was performed, taking into account direct costs. The total medical device costs that patients had anticipated to fully claim within the SGK reimbursement scope were considered. Clinical data (infection rates, mortality rates and prophylactic antibiotic use rates) for the study were obtained from expert opinions and a literature review, and data on costs were obtained from the Health Implementation Communiqué (SUT).

Table 2. Information on Infection Rates

Treatment	Risk of Infection CRT-D (up to 24 months)	Risk of Infection CRT-P (up to 24 months)	Infection Risk Reduction
Standart Care	%4,46	%4,46	-%47
TYRX	%2,35	%2,35	

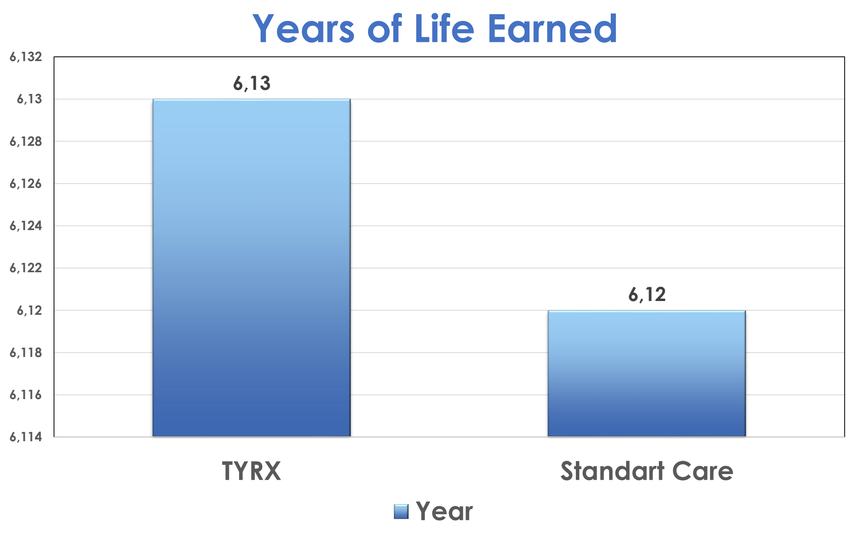
RESULTS

The analysis revealed that the total cost of using Tyrx was TRY 68,553 compared to TRY 41,604 for standard care. Comparing the infection treatment costs, 24 month costs for Tyrx were found to be TRY 33,950 and for standard care, TRY 7,063. The lifetime cost was TRY 34,602 for Tyrx and TRY 34,541 for standard care (Table 1). In patients treated with CRT-D and CRT-P, the risk of infection and the rate of minor CIED infections were observed to be 47% lower in those who received the TYRX over a period of up to 24 months (Table 2).

Table 1. Cost comparison of standard care and TYRX

Parameter	Standard Care	TYRX
Infection Treatment Costs*	7,063	33,950
Lifetime Costs	34,541	34,602
Total Cost	41,604	68,553

Cost are given in TRY
*: Includes cost of Tyrx, antibiotics and infections.



CONCLUSIONS

The TYRX absorbable antibacterial envelope promotes faster and smoother healing, reducing inflammation and forming a thin, even capsule. This could make follow-up procedures easier if needed. Despite its higher cost, TYRX treatment offers significant clinical benefits by lowering the risk of infection, which is associated with a threefold higher mortality risk. Therefore, it is recommended that TYRX be considered as a treatment option for high-risk patients, leading to potential reimbursement by the SGK based on the evaluation of relevant experts.

REFERENCES

1. Mirowski, M. M. A. M. J., Mower, M. M., Langer, A., Heilman, M. S., & Schreibman, J. (1978). A chronically implanted system for automatic defibrillation in active conscious dogs. Experimental model for treatment of sudden death from ventricular fibrillation. Circulation, 58(1), 90-94.
2. Kron, J., Herre, J., Renfroe, E. G., Rizo-Patron, C., Raitt, M., Halperin, B., ... & AVID Investigators. (2001). Lead-and device-related complications in the antiarrhythmics versus implantable defibrillators trial. American heart journal, 141(1), 92-98.
3. Brocker, D. T., & Grill, W. M. (2013). Principles of electrical stimulation of neural tissue. Handbook of clinical neurology, 116, 3-18.
4. Mayo Clinic Organization. "Cardiac Resynchronization Therapy". Erişim Tarihi: 03.05.2023. https://www.mayoclinic.org/tests-procedures/cardiac-resynchronization-therapy/pyc-20385014
5. Mayo Clinic Organization. "Deep Brain Stimulation". Erişim Tarihi: 03.05.2023.https://www.mayoclinic.org/tests-procedures/deep-brain-stimulation/about/pac-20384562
6. Northwestern Medicine Organization. "Sacral Neuromodulation". Erişim Tarihi: 03.05.2023. https://www.nm.org/conditions-and-care-areas/treatments/sacral-neuromodulation
7. Mayfield Clinic. "Spinal Cord Stimulation". Erişim Tarihi: 03.05.2023. https://mayfieldclinic.com/pe-stim.htm
8. Mount Sinai Organization. "Spinal Cord Stimulation". Erişim Tarihi: 03.05.2023. https://www.mountsinai.org/health-library/surgery/spinal-cord-stimulation
9. Tarakji, K. G., & Wilkoff, B. L. (2013). Management of cardiac implantable electronic device infections: the challenges of understanding the scope of the problem and its associated mortality. Expert review of cardiovascular therapy, 11(5), 607-616.
10. Koerber SM, Turagam MK, Winterfield J, Gautam S, Gold MR. Use of antibiotic envelopes to prevent cardiac implantable electronic device infections: A meta-analysis. J Cardiovasc Electrophysiol. 2018;29(4):609-615. doi: 10.1111/jce.13436.
11. TYRX Emilebilir Antibakteriyel Kılıf. Türkçe Kullanım Kılavuzu.
12. Tarakji KG, et al.; WRAP-IT Investigators. Antibacterial Envelope to Prevent Cardiac Implantable Device Infection. N Engl J Med. 2019 16;380(20):1895-1905. doi: 10.1056/NEJMoa1901111.
13. Woods, B., Revill, P., Sculpher, M., & Claxton, K. (2016). Country-level cost-effectiveness thresholds: initial estimates and the need for further research. Value in Health, 19(8), 929-935.
14. Aubert, R. E., & Epstein, R. S. (2010). Approaches to assessing value: personalized diagnostics In Institute of Medicine, Value in health care: accounting for cost, quality, safety, outcomes, and innovation: workshop summary (pp. 80-86). Washington, DC: The National Academies Press.
15. Goodman, C. S. (2014). HTA 101: Introduction to health technology assessment. Bethesda, MD: National Library of Medicine.
16. Meltzer, D. O. (2010). Assessing the value of prevention. In Institute of Medicine, Value in health care: accounting for cost, quality, safety, outcomes, and innovation: workshop summary (pp. 63-72). Washington, DC: The National Academies Press.
17. T.C. Sosyal Güvenlik Kurumu. Değişiklik Tebliğleri İşlenmiş Sağlık Uygulama Tebliği 2013.
18. https://econalix.net/analysis/urun/İlaç Takip Uygulaması
19. T.C. Sağlık Bakanlığı (SB) Türkiye İlaç ve Tıbbi Cihaz Kurumu (TİTCK) ilaç fiyat listesi
20. Frausing, M. H. J. P., Kronborg, M. B., Johansen, J. B., & Nielsen, J. C. (2021). Avoiding implant complications in cardiac implantable electronic devices: what works?. EP Europace, 23(2), 163-173.
21. Pichlmaier, M., Knigina, L., Kutschka, I., Bara, C., Oswald, H., Klein, G., ... & Haverich, A. (2011). Complete removal as a routine treatment for any cardiovascular implantable electronic device–associated infection. The Journal of thoracic and cardiovascular surgery, 142(6), 1482-1490.
22. Ahmed, F. Z., Fullwood, C., Zaman, M., Qamruddin, A., Cunnington, C., Mamas, M. A., ... & Zaidi, A. (2019). Cardiac implantable electronic device (CIED) infections are expensive and associated with prolonged hospitalisation: UK Retrospective Observational Study. PLoS One, 14(1), e0206611.
23. Wilkoff, B. L., Boriani, G., Mittal, S., Poole, J. E., Kennergren, C., Corey, G. R., ... & WRAP-IT Investigators. (2020). Impact of cardiac implantable electronic device infection: a clinical and economic analysis of the WRAP-IT trial. Circulation: Arrhythmia and Electrophysiology, 13(5), e008280.
24. TÜİK. (2024). Dönemsel Gayrisafi Yurt İçi Hasıla, IV. Çeyrek: Ekim-Aralık 2023