Quality of life after neuromodulation for epilepsy

Jacco Smeets, MSc[1], Linda Ackermans, MD, PhD[2,3,6], Ghislaine van Mastrigt, PhD[4], Rob Rouhl, MD, PhD[3,5], Louis Wagner, MD[3,6], Sander van Kuijk, PhD[7], Jeske Nelissen[5], Ilse van Straaten, MD, PhD[8], Kuan Kho, MD[9], Francesca Snoeijen-Schouwenaars, MD, PhD[6], Anne-Marthe Meppelink, MD, PhD[10], Sylvia Klinkenberg, MD, PhD[5,6], Kim Rijkers, MD, PhD[2,3,6], Marian Majoie, MD, PhD[3,5,6]

[1]Faculty of Health, Medicine and Life Sciences, Maastricht University [2]Department of Neurosurgery, Maastricht University Medical Center [3]School for Mental Health & Neuroscience, Maastricht University Medical Center [4]CAPHRI: Care and Public Health Research Institute, Maastricht University [5]Department of Neurology, Maastricht University Medical Center [6]ACE: Academic Center for Epileptology [7]Department of Clinical Epidemiology and Medical Technology Assessment, Maastricht University Medical Center [8]Department of Neurology, Amsterdam University Medical Center, location VUmc [9]Department of Neurosurgery, Medisch Spectrum Twente [10]SEIN: Centre of Excellence for Epilepsy and Sleep Medicine

Key words: epilepsy, quality of life (QoL), neuromodulation

Objective

Epilepsy, one of the most frequently occurring chronic neurological disorders, is associated with reduced quality of life (QoL). Epilepsy is generally treated with anti-epileptic drugs, however, 30% of epilepsy patients are drug resistant, meaning that they continue to have seizures despite adequately dosed medication. If resective epilepsy surgery is not an option or did not have a significant effect, neuromodulation might be an option. Two types are currently accepted in The Netherlands: Deep Brain Stimulation (DBS) and Vagus Nerve Stimulation (VNS). VNS has been used for over 20 years in The Netherlands, DBS for 10 years. Observational studies show that DBS and VNS lead to a seizure reduction of 50% or more in respectively 54% and 32% of patients after 2 years. QoL in epilepsy heavily depends on seizure control. Few small previous studies show that neuromodulation in epilepsy increases QoL. However, there is no data on QoL changes after neuromodulation for epilepsy in the Netherlands. We therefor aim at determining the change in QoL in drug resistant epilepsy patients treated with DBS or VNS.

Methods

Included are all patients above 15 years of age referred for DBS or VNS to one of the three participating hospitals: Maastricht University Medical Center, Amsterdam University Medical Center and Medisch Spectrum Twente. After informed consent they receive a package of

questionnaires before and 6, 12, 24, and 60 months after surgery. Data on seizure frequency are derived from the patient charts.

Results

We expect that medically refractory epilepsy patients will report a better QoL after treatment with DBS or VNS. Treatment with DBS or VNS for epilepsy usually leads to less seizures, instead of a complete disappearance of seizures. When patients report a better QoL after DBS or VNS, even though they still report seizures, the treatment can be seen as useful. This is especially true when patients can participate in society again, to a greater extent than before treatment.

Conclusions

Previous research shows that neuromodulation might lead to an increase in QoL in patients with drug resistant epilepsy. We expect that this prospective study will lead to similar results.