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EDITORIAL COMMENT

Editorial comment to "Implementation of sacral neuromodulation for urinary indication. A Danish prospective cohort study from the first 15 months" by Kobberø H, Andersen M, Andersen K, et al.

Electrical stimulation: an undervalued treatment principle in urology

Electrical stimulation is an underestimated asset in the treatment of urinary dysfunctions—unfortunately still unfamiliar to many urologists and with comparatively few people involved in this research area, being overshadowed by successful activities in other fields of urology. That been said, a plethora of interesting and important contributions have been published on a variety of technologies [1], but electrical stimulation in comparison with treatments like drugs and surgery is sparse in urology.

The use of electro-medicine has been more prominent in other medical fields (for example, cardiology) and many highly rewarding experiences have been gained. A different recent example is research under way at the Karolinska Institute in Stockholm, in detail describing mechanisms for remission of gut inflammation resulting from *n. vagus* electrical stimulation, illustrating communications between nerves and the immune system [2]. In this context it may be relevant to mention some observations from our unit on effects on the lower urinary tract (LUT) of electrical stimulation made almost 40 years ago:

In women with various forms of urinary incontinence treated by means of individually adjusted vaginal electrodes there was an effect on symptoms to various degrees in 90% of subjects and, even more remarkably, 45% of subjects were free of symptoms even when stimulation was interrupted, a phenomenon called reeducation [3]. In a case report on a quite different mode of electrical stimulation, implantation of electrodes into the *conus medullaris* because of the unusual state of persistent spinal shock, followed by subsequent chronic stimulation, another remarkable effect was observed; after several years of daily use of the stimulator the bladder state reverted into a reflex bladder, with no further need to use the electrical stimulator [4]. In quite a different population a limited part of patients treated with suprapubic transcutaneous electrical nerve stimulation owing to chronic interstitial cystitis became free of symptoms combined with loss of the distinctive clinical marks of the disease. Cases in question had suffered the typical features of bladder wall chronic inflammation, with decades of disease duration [5]. The described effects were unexpected and are still unexplored in detail. However, they indicate a unique potential of electrical stimulation to restore functions of LUT central neural pathways, among other things involving long term potentiation of synapses, and also inhibition of inflammatory responses following electrical stimulation. There is an underused potential for these techniques in urology.

Unfortunately, just a few urology applications of electrostimulation have matured into general use - progress requiring continuous technical and commercial efforts and support. The technique of sacral root neuromodulation pioneered by Tanagho and Schmidt [6] is one exception, has multiple users, and is constantly improving; now working quite well in centers with well-organized routines [7]. Considering the unique potentials of patient benefit these techniques should be more widespread. Limitations are the learning curve, sometimes vague indications and that volumes of patients per center have to be sufficient to maintain good technical skills as well as working routines. The present research group has to be congratulated [8]. Although they were in the beginning phase of the learning curve, and in spite of focusing on real problem cases with quite heterogenic causes, previously subjected to multiple treatment attempts, their results were favorable and, apart from two device infections, complications were mild. Their achievements have to be applauded, and the gain for their unfortunate group of patients is obvious. This treatment principle should be taken more seriously. Although not suited for every department, there should be a reasonable geographical spread of centers using these techniques, to make the methods accessible to a broader patient population.

In the absence of more precise alternatives selection to neuromodulation is based on refractory symptoms and response to the percutaneous test. Multidisciplinary efforts are needed in the future, though: causally determined target diagnoses should be the preferred principle. Hopefully, by groups like the present author team networking and cooperating with other groups with investigating capacities specific diagnoses will be identified where electrical stimulation treatment can be selected as a first line treatment rather than as a last resort preceded by multiple trying and sometimes expensive treatment efforts.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Magnus Fall http://orcid.org/0000-0002-7442-002X

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Magnus Fall

Department of Urology, Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Sweden

magnus.fall@urology.gu.se

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