#470 Transcutaneous tibial nerve stimulation in the treatment of overactive bladder

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Background

Overactive bladder (OAB) is a condition that has physical, social, psychosocial, and financial impacts[1]. OAB symptoms commonly have a significant impact on an individual's overall well-being, with lower quality of life (QoL) scores consistently reported in people diagnosed with OAB. First line of treatment for OAB involves behavioural and lifestyle modifications such as caffeine and fluid restrictions and education around bladder training and frequency. A combination of these educational strategies have been shown to improve symptom severity and QoL in large patient cohorts; however, most evidence is low quality and not specific to OAB[2]. Percutaneous tibial nerve stimulation (PTNS) is one treatment modality commonly used to treat OAB. It requires specialised equipment and a trained health professional to administer a needle close to the tibial nerve. Transcutaneous tibial nerve stimulation (TTNS) is a modality that stimulates the nerve root fibres of L5-S3, the same spinal segments of the parasympathetic nervous system as the bladder[3]. It is more accessible to patients as they can self-administer it at home.

This scoping review aimed to explore available literature on the outcomes and feasibility of TTNS in the management of OAB.

METHODS

Six electronic databases (CINAHL, Cochrane, Embase, Emcare, MEDLINE and PsycINFO) were searched to identify eligible full text articles published between 2015 and December 2020. The inclusion and exclusion criteria was:

Inclusion criteria	
Population	Aged 18 years and over Neurogenic bladder OAB (urgency ± frequency ± incontinence ± voiding dysfunction)
Design	Multi-armed RCT and prospective trials
Other	Full text English articles Articles from 2015
Exclusion criteria	
Population	OAB caused by congenital conditions Bladder symptoms are not the primary symptom Receiving Botox or anti cholinergic/muscarinic treatment TTNS being used an adjunct to another primary treatment
Design	Literature reviews and systematic reviews Cohort or single arms studies

RESULTS

945 articles were yielded from the search and 41 full text articles were screened for eligibility. **15** articles met the inclusion criteria for analysis.

- Duration was consistently 30 minutes and applied continuously for most studies, whilst frequency of application varied from daily to weekly (mean 2.93 days) with time frames ranging 4 to 12 weeks (mean 7.78 weeks).
- The frequency (Hz) ranged from 1-20 Hz and pulse widths 200-300uS.
- Intensity was either set or increased to maximum tolerance.
- Eleven of fifteen (73%) studies stated similar electrode placements, being from medial malleolus to within 10 cm proximally and four did not specify apart from at ankle over the tibial nerve or medial region of ankle.

CONCLUSIONS

TTNS is a promising first-line management option for people with OAB, particularly in the older population and for those with neurogenic bladder.

The lack of side effects and adverse events and the ease of use, non-invasiveness and low cost are some of the reasons TTNS should be considered as first line treatment.

Due to the heterogeneity of studies, it is unclear what the optimum parameters are for the use of TTNS for the treatment of OAB.

Future research exploring the understanding of the pathophysiologic contributors from TTNS on bladder function may assist in addressing the methodologic heterogeneities currently making comparison between modalities difficult. Long term effectiveness and cost comparison also need to be explored.

The strongest evidence for efficacy of TTNS is in these patient groups:

Patient group	Studies
People with less severe symptoms or amongst less refractory patients	Welk et al.[4]
Females with MS and mild OAB symptoms	Dunya et al.[5]
Older age groups, females with age associated oestrogen depletion	Jacomo et al.[6]
Neurogenic bladder	Seth et al.[7], Chen et al.[8], Dunya et al.[5]
Urodynamic diagnosis of Detrusor Overactivity	Vandoninck et al.[9]
Those who tolerated higher intensity TTNS	Vandoninck et al.[9]
Patients with additional diseases or symptoms preventing the use of second line drug therapy	Zonić-Imamović et al.[10]

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