

ANALYSIS OF THE INFLUENCE OF THE ADRB3 GENE POLYMORPHISM AND THE DETRUSOR-SPHINCTER DYSSYNERGY TYPE IN PATIENTS WITH NEUROGENIC BLADDER IN THE COURSE OF MULTIPLE SCLEROSIS ON THE EFFECTIVENESS OF BOTULINUM TOXIN TREATMENT - PRELIMINARY REPORT.

Introduction

Multiple sclerosis (MS) is a chronic disease of the central nervous system characterized by disseminated lesions of demyelination and axonal loss leading to atrophy of the nervous tissue. One of the important non-sphincter symptoms is the lack of sphincter control: the neurogenic bladder. Overactive bladder (OAB), as defined by ICS in 2002, is a multisymptomatic disease that consists of urgency with or without urinary incontinence, usually with an increased frequency of daytime voiding and nocturia. The disruption of the neural pathways connecting the pontal micturition center to the sacral voiding center is usually the cause of detrusor-sphincter dyssynergy (DESD). Three main types of DESD are known. In the first type, the increase in detrusor pressure is accompanied by an increase in EMG activity. Type II DESD is characterized by occasional contractions of the external urethral sphincter during detrusor contraction. In type III DESD, the sphincter contracts in a characteristic crescendo-decrescendo fashion, which causes a tubular obstruction throughout the detrusor contraction. In line with the ICS guidelines, four lines of treatment of overactive bladder have been distinguished. Botulinum toxin is recommended as therapy for patients refractory to pharmacological treatment. The mechanism of action of botulinum toxin is related to the ADRB 3 receptor, which has polymorphic variants.

Aim

The aim of the study was to assess the effectiveness of treatment of patients with neurogenic bladder in the course of multiple sclerosis with botulinum toxin depending on the type of detrusor-sphincter dyssynergy and on the polymorphism of the ADRB 3 gene.

Study design, materials and methods

35 patients with diagnosed neurogenic bladder in the course of multiple sclerosis were enrolled in the study on the basis of an interview, ICIQ-OAB, ICIQ-OABgol and ICIF-LUTSqol questionnaires. Each patient underwent urodynamic examination and a specific type of detrusor-sphincter dyssynergy. Each patient had a cheek swab taken to determine the ADRB 3 gene polymorphism. Each patient underwent the procedure of injecting botulinum toxin into the walls of the bladder in a hospital setting under general and intravenous anesthesia. After 3 months, each patient was re-interviewed using the ICIQ-OAB, ICIQ-OABgol and ICIF-LUTSqol questionnaires. Inclusion criteria for the study were no effect after pharmacological treatment, intolerance to pharmacological treatment, and age > 18 years of age. Exclusion criteria were prior intravesical administration of botulinum toxin, urinary tract infection, mixed urinary incontinence, and urogynecological surgeries. Only question 23 from the ICIF-LUTSqol questionnaire to evaluate the effectiveness of botulinum toxin treatment was selected for the analysis.

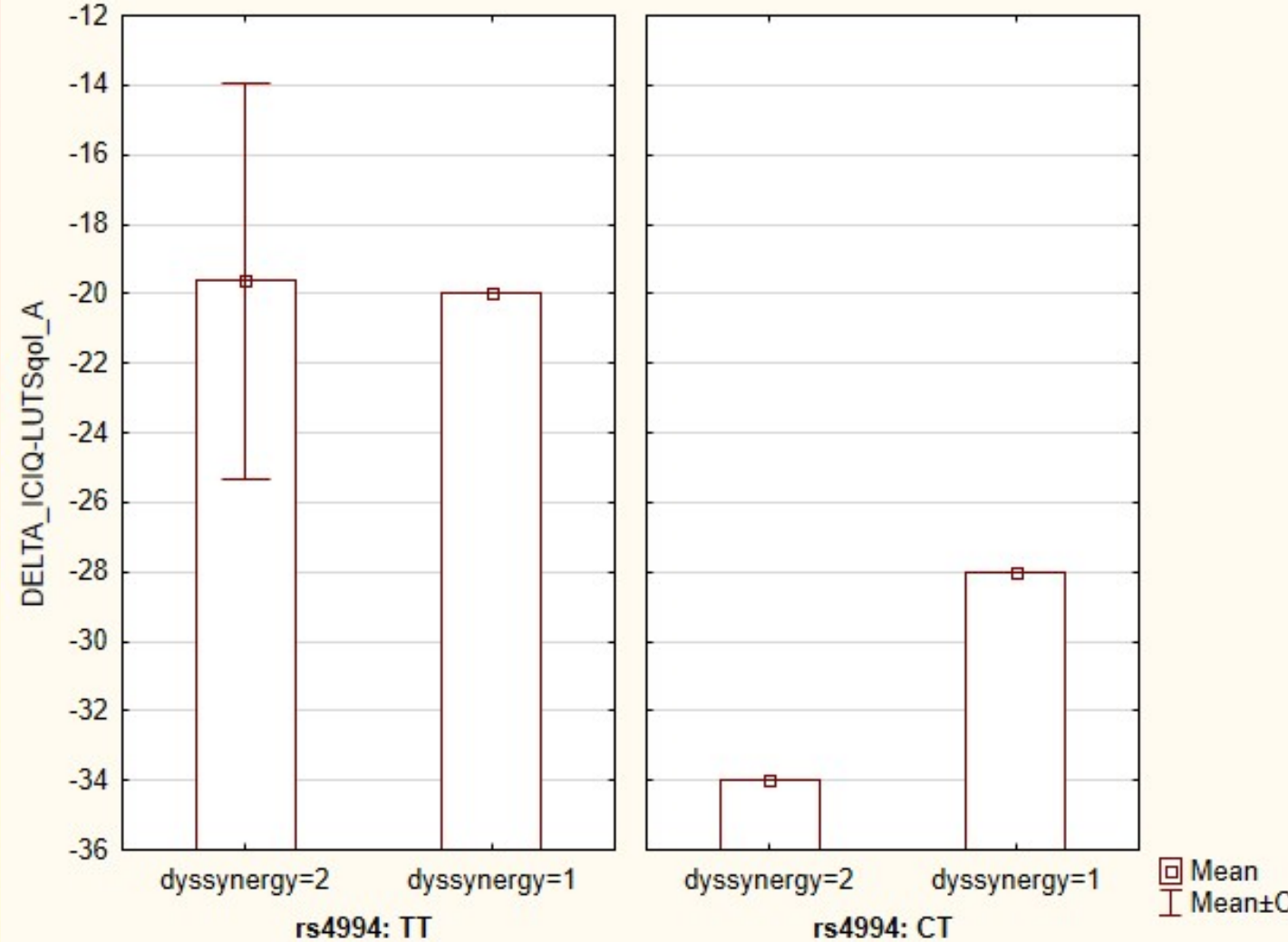
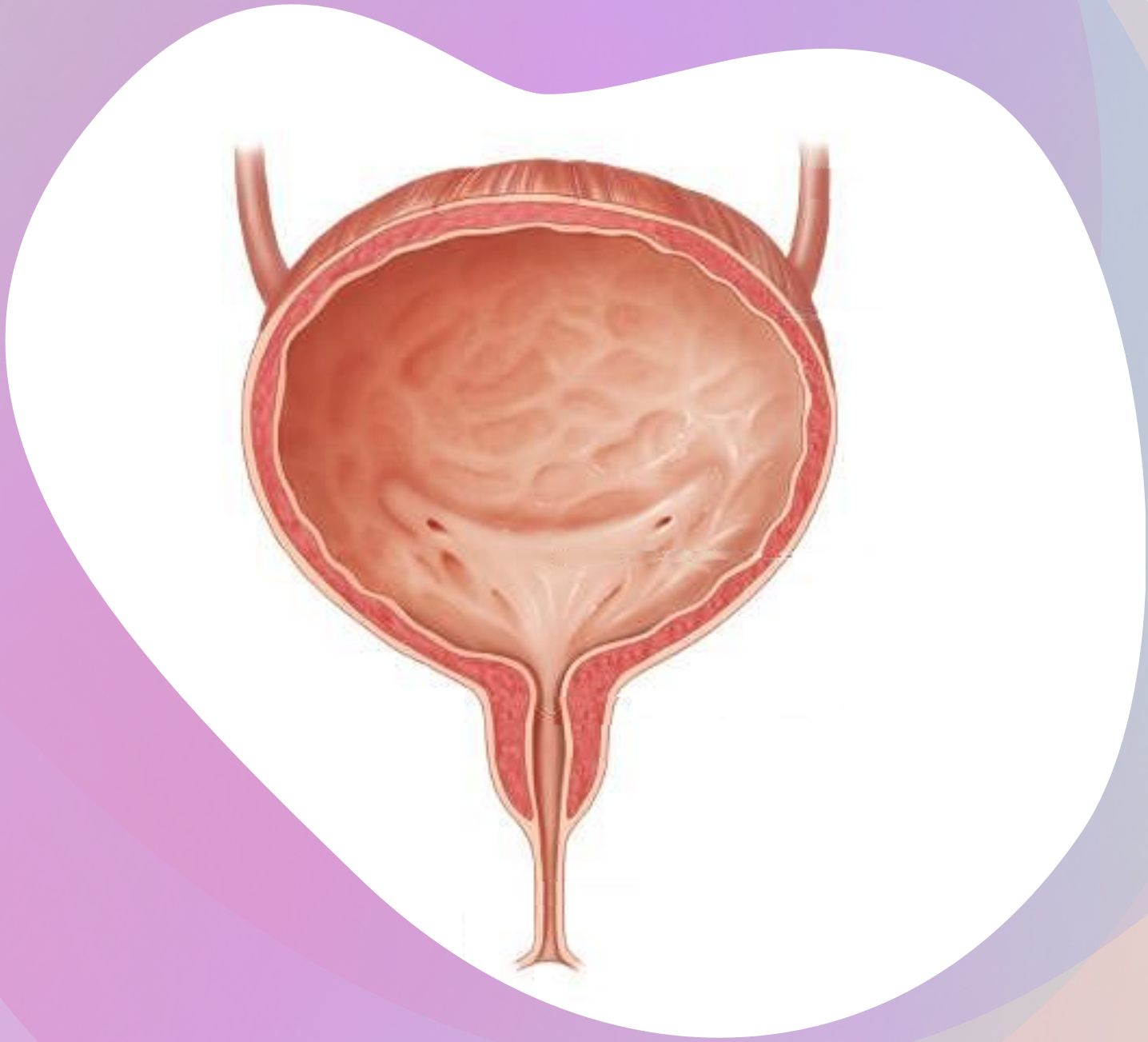


Fig. 1

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Results

In 35 patients with neurogenic bladder in the course of MS, 33 patients were diagnosed with type 2 DESD and in 2 patients with type 1 DESD. No patient was diagnosed with type 3 DESD. Among 33 patients with type 2 DESD, 32 had the TT variant of the ADRB3 gene polymorphism (96.97%) and only 1 patient had the CT variant of the ADRB 3 gene polymorphism (3.03%). Among 2 patients with type 1 DESD, 1 patient had the TT variant of the ADRB3 gene polymorphism (50%) and 1 patient had the CT variant of the ADRB3 gene polymorphism (50%). In all patients, the quality of life improved significantly.

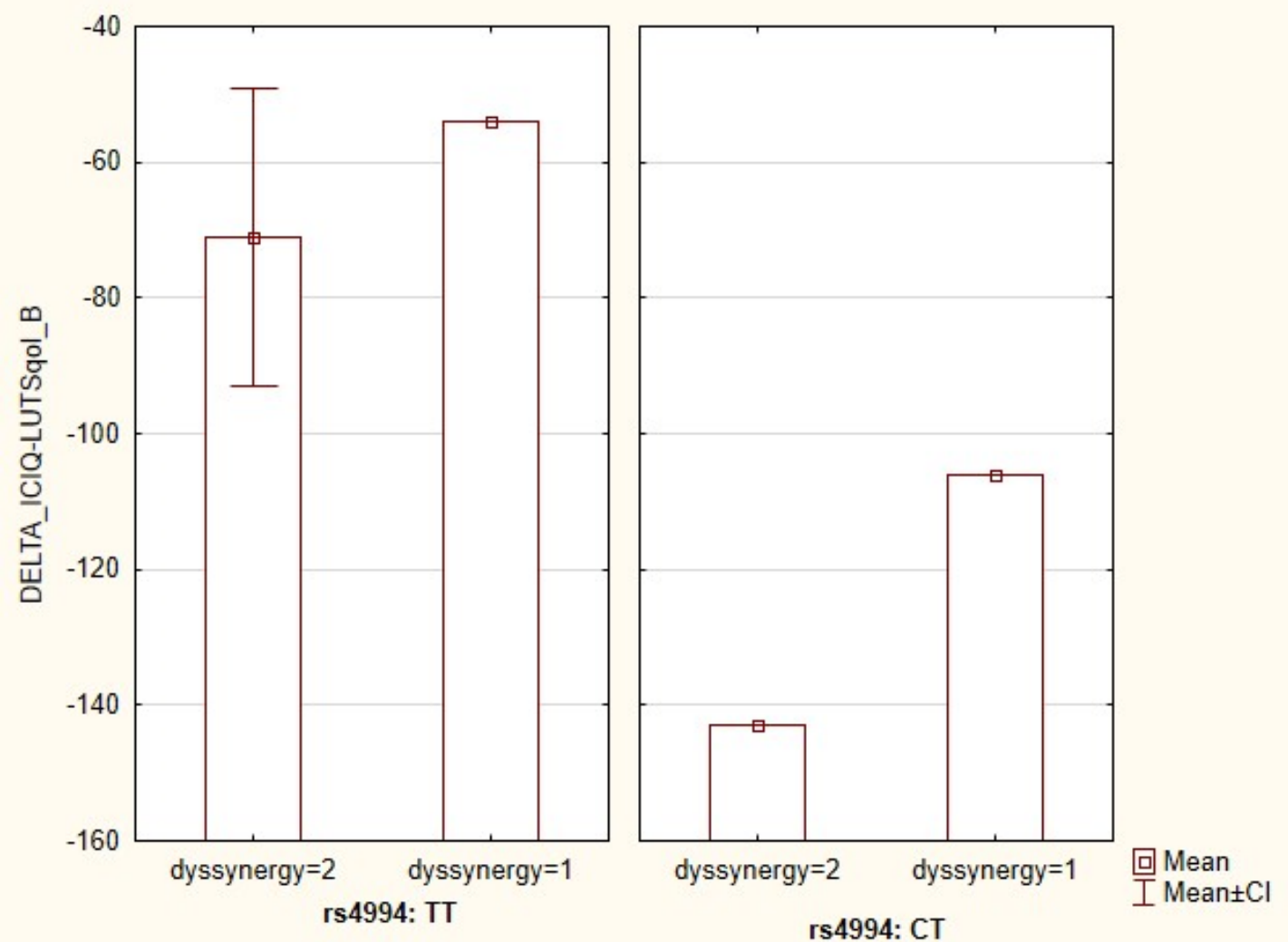


Fig. 2

Interpretation of results

On the basis of the obtained results, a significant improvement in the quality of life was found in patients with neurogenic bladder in the course of multiple sclerosis after injecting the bladder walls with botulinum toxin 200 U. ADRB3. Most likely, the lack of a significant influence of the above analyzed relationships results from the small study group and taking into account only one variable from the quality of life survey (ICIQ-LUTSqol).