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Bhide A[1], Gopalan V[1], Cartwright R[1], Digesu G A[1], Puccini F[1], Fernando R[1], Khullar V[1]
1. *Imperial College London*

BRAIN DERIVED NEUROTROPHIC FACTOR (BDNF) IS NOT A VALUABLE BIOMARKER FOR DIAGNOSING DETRUSOR OVERACTIVITY.

Hypothesis / aims of study

BDNF is part of the neurotrophin family. Neurotrophins are growth factors required by neuronal cells for differentiation, survival and maintenance acting on both the central and peripheral nervous system. It has been shown that the expression of BDNF mRNA is up-regulated in models of inflammatory pain resulting in greatly increased sensitivity to painful stimuli. Other animal models of acute and chronic chemical cystitis induced with cyclophosphamide (CYP) also showed an increase in urinary bladder mRNA for BDNF.

Therefore BDNF has been suggested to be a valuable indicator of inflammatory processes within the bladder. Some authors hypothesised that inflammation may be a causative factor in detrusor overactivity and overactive bladder (OAB). There is limited data available on the role of BDNF in lower urinary tract symptoms (LUTS) and it is too early to say whether it can be used solely to diagnose OAB and detrusor overactivity (DO). The aim of this study therefore was to assess whether the quantification of urinary BDNF levels can be used in a clinical setting as a simple, non-invasive diagnostic tool in the evaluation of women with LUTS, discriminating those who have detrusor overactivity or not thus potentially replacing urodynamics.

Study design, materials and methods

Women with LUTS were recruited from a tertiary referral urodynamics clinic. The exclusion criteria were history of moderate or severe pelvic organ prolapse, neurological conditions, renal or bladder calculi, voiding dysfunction, history of recurrent urinary tract infection (UTI) and systemic inflammatory conditions. All eligible women completed a three day frequency-volume chart, a King's health questionnaire and underwent urodynamics using a standardised protocol according to ICS guidelines.

A midstream specimen of urine was collected prior to urodynamics. Urinanalysis was done and those with blood, leucocytes or nitrites were not included. All urine samples were sent for microscopy, culture and sensitivity (MCS). The urine was immediately centrifuged at 3000 rpm at 4^{0} C for 10 minutes. About 3 ml of urine was also sent to measure urine creatinine. The centrifuged supernatant urine was then frozen at -80^{0} C and used to measure the urinary BDNF levels by ELISA using the BDNF E max Immuno assay system (Promega Madison WI). The total urinary BDNF levels were further normalized to the concentration of urinary creatinine (BDNF/Cr level). Samples from women who had a positive UTI on MSU where excluded from analysis.

Results

A total of 75 women were recruited. Only 37 women were included in the sample analysis. 23 women had detrusor overactivity while 14 did not have any evidence of abnormal detrusor contraction during urodynamics. Urinary BDNF mean values were compared between women with DO and no-DO using the Mann-Whitney U test (SPSS software v19.0).

Interpretation of results

The mean urinary BDNF level was not statistically significant between the 2 groups as shown in table 1 (Mann Whitney U test, p = 0.16).

	Mean BDNF	Standard deviation	P value
DO group (n=23)	3.581993968	+/- 4.714713979	0.16
Non-DO group (n=14)	4.421775355	+/- 5.203676035	

Table 1 mean BDNF levels between DO and no-DO groups

Concluding message

Our study showed that urinary BDNF levels do not statistically differ between women with and without detrusor overactivity. Therefore based on our findings BDNF cannot be considered as a useful biomarker to diagnose detrusor overactivity. However larger studies are needed in order to confirm our findings.

Disclosures

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