

## URINE NERVE GROWTH FACTOR LEVELS ARE ELEVATED IN TYPE 2 DIABETIC PATIENTS AGED LESS THAN 45 YEARS OLD AND CORRELATED WITH ERECTILE DYSFUNCTION BUT NOT LOWER URINARY TRACT SYMPTOMS

### Hypothesis / aims of study

Urine nerve growth factor (NGF) levels have been considered as a novel biomarker for diagnosing overactive bladder. Overactive bladder is a common clinical presentation in the early stage of diabetes. Erectile dysfunction is associated with lower urinary tract symptoms. Taking together, we hypothesize that urine NGF levels is elevated in the early stage of diabetes and correlated with the severity of lower urinary tract symptoms and erectile dysfunction. The aims of study is to investigate urine NGF levels in type 2 diabetic men younger than 45 years old and to correlate the lower urinary tract symptoms and erectile dysfunction.

### Study design, materials and methods

Urinary NGF levels were measured in 72 diabetic patients and in 20 control subjects without lower urinary tract symptoms or erectile dysfunction. The urinary NGF levels were measured by enzyme-linked immunosorbent assay. The total urinary NGF levels were normalized to the concentration of the urinary creatinine (NGF/Cr) level. Participants were evaluated using the International Prostate Symptom Score (IPSS), quality of life (IPSS-QOL), Overactive Bladder Symptom Score (OABSS), the five-item version of the International Index of Erectile Function questionnaire (IIEF-5), the patient perception of bladder condition (PPBC) questionnaire and measurement of flow rate and postvoid residual urine volume. The Spearman correlation analyses were used to examine urinary NGF/Cr levels associated with IPSS, IIEF-5, OABSS, PPBC and uroflowmetry.

### Results

The mean (SD, range) age of the diabetic patients was 39.8 (6.1, 19-45) years and the mean duration of diabetes was 4.0 (4.0, 0.5-20) years. Diabetic patients had significantly higher urinary NGF/Cr levels compared to the controls ( $0.48 \pm 1.2$  versus  $0.01 \pm 0.01$ ,  $p=0.04$ ). The urinary NGF/Cr levels were negatively correlated with IIEF-5 score ( $p=0.03$ , coefficient=  $-0.26$ ,  $-0.02$ -- $0.47$ ). The urinary NGF/Cr levels were not correlated with age ( $p=0.33$ ), diabetic duration ( $p=0.75$ ), body mass index ( $p=0.30$ ), IPSS score ( $p=0.69$ ), OABSS score ( $p=0.70$ ), voided volume ( $p=0.91$ ), peak flowrate ( $p=0.54$ ), postvoid residuals ( $p=0.89$ ). Forty-two patients with urinary NGF/Cr level  $<0.05$  had higher IIEF-5 score than 30 patients with urinary NGF/Cr level  $\geq 0.05$  ( $20.2 \pm 4.6$  versus  $16.9 \pm 6.7$ ,  $p=0.03$ ).

### Interpretation of results

Previous study has been showed that type 2 diabetic patients aged less than 45 years old have more lower urinary tract symptoms and erectile dysfunction. This study further demonstrated that compared with controls, diabetic patients aged less than 45 years old have higher urine NGF levels, a biomarker of overactive bladder. However, the urine NGF levels were not correlated with the severity of lower urinary tract symptoms or overactive bladder symptoms. Interestingly, the urine NGF levels were correlated with the severity of erectile dysfunction.

### Concluding message

Urinary NGF levels were elevated in type 2 diabetic male aged less than 45 years. Urinary NGF levels were correlated with erectile dysfunction but not correlated with lower urinary tract symptoms, OAB symptoms or the parameters of uroflowmetry in these patients.

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<b>What were the subjects in the study?</b>	<b>HUMAN</b>
<b>Was this study approved by an ethics committee?</b>	<b>Yes</b>
<b>Specify Name of Ethics Committee</b>	<b>Institutional Review Board of the En Chu Kong Hospital</b>
<b>Was the Declaration of Helsinki followed?</b>	<b>Yes</b>
<b>Was informed consent obtained from the patients?</b>	<b>Yes</b>