

URINARY NERVE GROWTH FACTOR MAY PREDICT THERAPEUTIC EFFICACY IN CHILDREN WITH OVERACTIVE BLADDER

Hypothesis / aims of study

Overactive bladder (OAB) is one of the most common voiding dysfunctions in children. Its diagnosis is mainly based on results of clinical examinations, including a frequency volume chart and uroflowmetry. These methods, however, are not often accurate in children. Urinary nerve growth factor (NGF) is considered to be a biomarker for OAB in the adult population. Only a few reports have reported the association between urinary NGF levels and OAB in children. In this study, we measured urinary NGF in children with OAB, and investigated the relationship between urinary NGF/Cr levels and OAB. We also analyzed whether urinary NGF/Cr levels can predict the therapeutic efficacy in children with OAB.

Study design, materials and methods

Urine samples were collected from 35 children (27 boys and 8 girls) with OAB before treatment and 11 children (6 boys and 5 girls) without OAB or any other urinary symptoms as controls. Urinary NGF levels were measured with ELISA (Enzyme-Linked ImmunoSorbent Assay) using the Emax Immunoassay System (Promega, Madison, WI, USA). The total urinary NGF levels were adjusted with the concentration of urinary creatinine (NGF/Cr level). Children with OAB were treated firstly with common urotherapy, and then with an anticholinergic agent subsequently. The treatment outcomes were assessed after at least three-month treatment. Refractory OAB was defined as hardly improvement of OAB symptoms despite of at least three-month urotherapy and anticholinergic agent treatment. Urinary NGF/Cr was compared between the children with OAB and the controls. The relationship between urinary NGF/Cr and treatment outcomes was also evaluated.

Results

Urinary NGF/Cr was significantly higher in the children with OAB when compared to the controls (0.71 ± 0.93 vs. 0.11 ± 0.09 , respectively) ($p=0.0009$) (Fig. 1). Improvement of OAB symptoms was observed in 27 out of 35 children (77%) (the improved group: urotherapy alone in 11 children (31%) and urotherapy with a subsequent anticholinergic agent in 16 (46%)) after treatment. Remaining 8 children out of 35 (23%) showed refractory OAB symptoms (the refractory group). Urinary NGF/Cr was higher in the refractory group compared to that in the improved group, although not significant (1.30 ± 1.43 vs. 0.43 ± 0.34 , respectively, $p=0.06$) (Fig. 2).

Interpretation of results

In the present results, there was a significant difference in urinary NGF/Cr between the children with OAB and the controls. Furthermore, urinary NGF/Cr was higher in the refractory group compared to that in the improved group. These results might suggest that high urinary NGF/Cr reflects lower urinary tract dysfunction which may cause refractory OAB.

Concluding message

Urinary NGF/Cr was significantly higher in the children with OAB than that in the controls, and was higher in the refractory group than that in the improved group. Urinary NGF/Cr could be a potential biomarker for children with OAB, and might be a predictor of therapeutic efficacy in children with OAB.

Fig 1

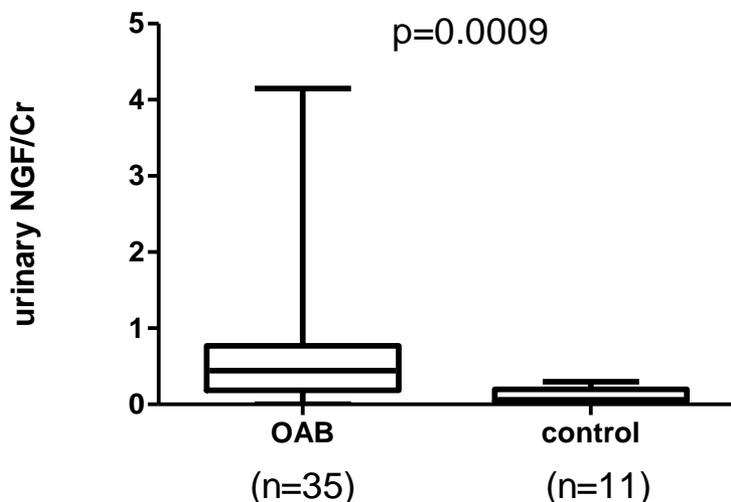
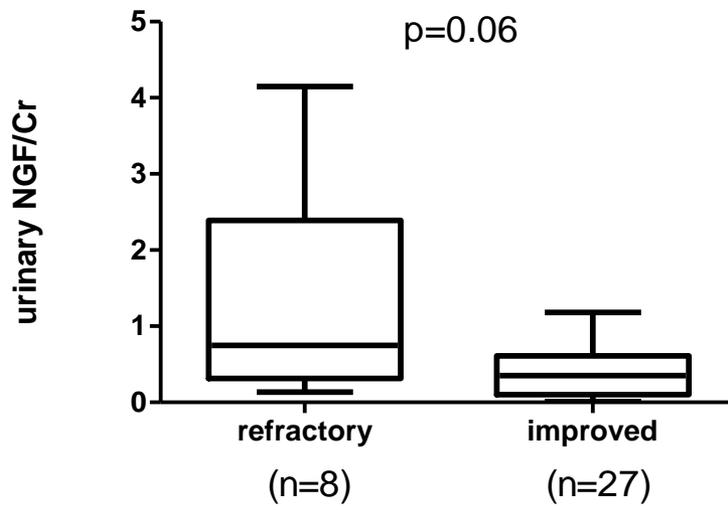


Fig 2



Disclosures

Funding: None. **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Nara Medical University Ethics Committee **Helsinki:** Yes **Informed Consent:** Yes