

INCREASED SECRETION LEVELS OF PROSTAGLANDIN E2 IN THE URINARY BLADDER OF BOYS LESS THAN 4 YEARS OF AGE.

Hypothesis / aims of study

Prostanoids such as prostaglandin E2 (PGE2) are implicated as endogenous modulators of bladder function under various physiological and pathophysiological conditions. Reportedly, PG synthesis in the urinary bladder of adult people was initiated by the various physiological stimuli such as detrusor muscle stretch with bladder outlet obstruction. However, there have been no reports on PG synthesis in the urinary bladder of young boys. It was reported that the detrusor pressure in voiding was higher in male infants than in older boys such as those 4 years of age or older once they acquired voluntary voiding control. In this study, we examined whether or not PGE2 levels in the urinary bladder influenced daytime dryness in boys.

Study design, materials and methods

Of 106 children who underwent urologic surgeries in our institution from October 2006 to October 2007, 44 boys participated in this study. The exclusion criteria were bladder outlet obstruction, active urinary tract infection, spinal cord disease, neuropathy or renal dysfunction. Additionally, to minimize the influence of PGE2 produced in the kidney, patients with the urine Cr level above the mean+ 1 standard deviation (SD) in the samples were excluded from this study. All boys and their parents gave their written consent to participate in the present clinical research after being informed of the purpose. After urine was drained through a catheter, saline of a quarter volume of the estimated maximum bladder capacity [(age+2)×30ml] was instilled into the urinary bladder and was collected one minute later under general anaesthesia. The concentration of PGE2 and Cr in the collected saline was measured.

Comparisons between the groups were made using the Mann-Whitney U test. A probability value of 0.05 was considered statistically significant.

Results

After excluding 4 boys from this study because of their urine Cr level above the mean+ 1 SD, 40 boys (mean age: 4.1 years; range: 0.8-12 years) were examined. Their surgical diagnosis was undescended testis or hydrocele in 28, genital anomaly in 7 and upper urinary tract anomaly in 5. Twenty-eight of 40 boys were younger than 4 years (mean age: 1.7 years) and 12 were 4 years of age or older (mean age: 7.8 years).

Boys less than 4 years of age did not acquire daytime dryness yet, but boys 4 years of age or older acquired it. The concentration of PGE2 in the former (average 91.8 pg/ml) was significantly larger than that in the later (average 22.3 pg/ml) ($p=0.0014$) (Figure). But the relationship between the PGE2 concentration in the collected saline and age was not statistically significant.

Interpretation of results

In the present results, there was a significant difference in the PGE2 secretion levels in the urinary bladder between boys less than 4 years of age and those 4 years of age or older. Moreover, the former did not acquire daytime dryness, but the later already achieved daytime dryness. These might imply that the increase in PGE2 in the urinary bladder have affect on daytime dryness.

Concluding message

In the urinary bladder of boys less than 4 years of age, high pressure voiding is likely to induce PGE2 production or secretion, and the increased intravesical levels of PGE2 may delay acquiring the voluntary voiding control.

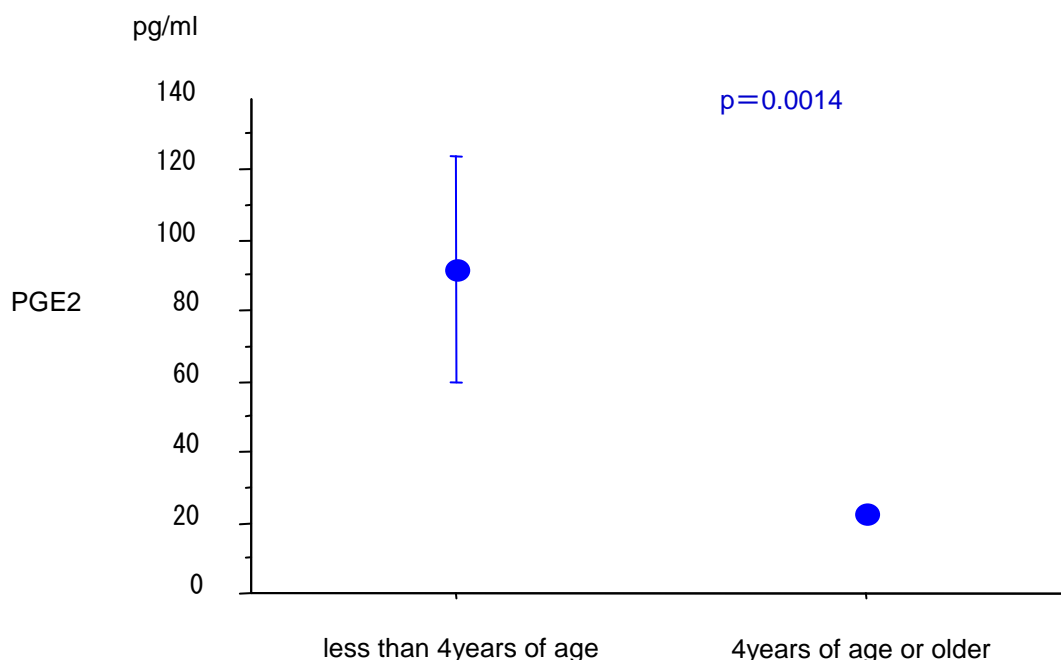


Figure. The concentration of PGE2 in the collected saline in boys less than 4 years of age was significantly larger than that in boys 4 years of age or older.

<i>Specify source of funding or grant</i>	We have no conflict of interest without any financial or personal relationships between other people or organizations and us. We have not received any financial support, funds or grant.
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	This study was approved by the Institutional Review Board, Faculty of Medicine, Nara Medical University.
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes