F-D5

Obesity Increases the Risk of a Febrile Urinary Tract Infection in Children

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Objective: Childhood obesity has increased significantly in recent decades worldwide. Urinary tract infection (UTI) is one of the most common bacterial infections found in children. The association between obesity and UTI has been investigated in adults, however, it has not been well studied in children. Therefore, the aim of this study was to characterize the relationship between obesity and pediatric UTI.

Method: We reviewed the medical records of children younger than 3 years who visited our institutions for febrile UTI and National infant health checkups (controls) between January 2008 and February 2012. All subjects were subcategorized into three groups with the lean (weight-for-length (WFL) <85 percentile), overweight (85 percentile ≤WFL <95 percentile) and obese (WFL ≥95 percentile) groups according to WFL and compared the incidence rate of UTI. Also, in UTI patients, fever duration, white blood cell counts and C-reactive protein values in peripheral blood, and the presence of hydronephrosis, acute pyelonephritis (APN), vesicoureteral reflux, and renal scar were compared among lean, overweight and obese groups.

Result: A total of 468 patients with UTIs and 812 controls were identified for evaluation. The 1,280 subjects were subcategorized into 3 groups; the lean, overweight and obese groups in 84.1%, 9.2% and 6.7%, respectively. In patients with UTIs, the diagnosis of an APN or lower UTI occurred in 32.3% and 67.1%, respectively. Gender distribution was 58.1% male in controls and 74.8% in patients with UTIs ($p<0.05$). The mean age was 12±8.7 months in controls and 4.9±5.2 months in patients with UTIs ($p<0.05$). After adjustment for gender and age, the obese were 1.84 times more likely to have a UTI (95% CI, 1.11-3.05, $p<0.05$), and 2.43 times more likely to have an APN than the lean population (95% CI, 1.27-4.62, $p<0.05$). The overweight were also 1.96 times more likely to have an APN than the lean group (95% CI, 1.11-3.46, $p<0.05$). In patients with UTIs, compared to the lean group, fever duration was significantly prolonged in the obese group (2.8±1,6 days vs 3.2±1.40 days, $p<0.05$), and the incidence rate of hydronephrosis was higher in the overweight group (Odds ratio 1.82; 95% CI, 1.06 to 3.14, $p<0.05$). However, there were no significant correlations between obesity and white blood cell counts and C-reactive protein values in peripheral blood and the presence of VUR and renal scarring.

Conclusion: Obesity is a significant risk factor for being diagnosed with febrile UTI as well as APN in children. Obese children with UTIs can have prolonged fever duration. These findings may be an important guidance for the diagnosis and management of febrile UTI in obese children.

Key Words: 비만, 신우신염, 요로감염
Obesity, Pyelonephritis, Urinary tract infection