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영아의 요로감염에서의 저나트륨혈증

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Hyponatremia May Reflect Severe Inflammation in Children with Febrile Urinary Tract Infection

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Purpose: The aim of this study was to evaluate whether serum sodium might be related to the degree of inflammation in infants and children with febrile urinary tract infection.

Patients and Methods: The data of 140 infants and children with febrile urinary tract infection admitted to Severance hospital and NIHC Ilsan Hospital were retrospectively analyzed. Laboratory examinations (white blood cell [WBC] count, erythrocyte sedimentation rate [ESR], C-reactive protein [CRP], and serum sodium), renal ultrasonography, DMSA scan, and voiding cystourethrogram were performed in these patients.

Results: In patients with renal cortical defect in DMSA scan (Group I), the duration of fever was significantly longer ($p=0.038$), and WBC count ($p=0.047$), CRP ($p<0.0001$), and the presence of vesicoureteral reflux ($p=0.017$) were significantly higher than in those without (Group II). However, serum sodium level was significantly lower in Group I than in Group II (135.9±2.4 vs. 137.4±2.7 mEq/L, $p=0.007$). Also, hyponatremia (serum sodium <135 mEq/L) was more frequent in Group I than in Group II (74.1% vs. 45.3%, $p=0.012$). Multiple logistic regression analysis showed decreased serum sodium level (Odds ratio=1.256, 95% CI 1.006-1.567, $p=0.044$), increased CRP levels (Odds ratio=1.151, 95% CI 1.043-1.270, $p=0.005$), and the presence of vesicoureteral reflux (Odds ratio=4.280, 95% CI 1.278-14.336, $p=0.018$) were independent risk factors for DMSA defect. Also, increased ESR level was an independent risk factor for hyponatremia (Odds ratio=1.005, 95% CI 1.004-1.107, $p=0.033$). When we analyzed all samples, the serum sodium concentration was negatively correlated with WBC count ($r=-0.156$, $p=0.011$) and CRP levels ($r=-0.160$, $p=0.028$).

Conclusion: Our study shows that hyponatremia may reflect severe inflammation in children with febrile urinary tract infection and we speculate that inflammatory cytokines might induce antidiuretic hormone, causing hyponatremia in these patients.

Key Words: 요로감염, 저나트륨혈증, 염증
Urinary tract infection, Hyponatremia, Inflammation