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일반 인구 집단에서 혈중 나트륨의 변화가 혈압과 사망에 미치는 영향

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A Small Increase in Plasma Sodium, Blood Pressure and Mortality in a Healthy Population

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Background: A significant but small increase in plasma sodium (pNa) has been observed with progressive increase in salt intake. However, little was known about the effect of the small increase of pNa. We evaluated the association with blood pressure according to the increase of pNa, and assessed the relationship with mortality in the normal range of pNa.

Methods and Results: Based on the data from routine health checkups in tertiary university hospitals during 1995–2009, 100,649 adult subjects were identified. In all patients, positive correlations between pNa and systolic BP (SBP), diastolic BP (DBP), and pulse pressure (PP) were noted in the participants with pNa≥138 mmol/L ($p<0.001$). In men and women aged ≥50 years, SBP, DBP, and PP were positively related to pNa. Women aged <50yrs did not show any relationship. In participants with metabolic syndrome components, the differences of SBP and DBP according to pNa were greater ($P<0.001$). Relative risks for SBP≥140mmHg increased with increasing pNa in men and women aged ≥50 years. The cumulative incidence of mortality was increased with increasing pNa in women aged≥50 years during median 4.2-year follow-up ($p<0.001$). In women, unadjusted risks for mortality were increased according to sodium groups (1.366(95% CI 1.000–1.867), 1.618(1.160–2.258), 2.946(2.005–4.329) in pNa 141–142, 143–144, and ≥145mmol/L, respectively). After adjustment, only pNa≥145 was related to mortality (1.852(1.245–2.754)).

Conclusions: The positive correlation between pNa and BP was stronger in older subjects, women, and subjects with metabolic syndrome component. The incidence and adjusted risks of mortality were increased with increasing pNa within normal range in women aged ≥50 years.

Key Words: 혈압, 사망, 혈중 나트륨
Blood pressure, Mortality, Plasma, Sodium