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COMMON VARIATION IN WNK1 AND BLOOD PRESSURE RESPONSES TO DIETARY SODIUM OR POTASSIUM INTERVENTIONS: A FAMILY–BASED ASSOCIATION STUDY

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Objectives Blood pressure response to dietary sodium and potassium intake varies considerably among individuals, but the heterogeneity is far from being completely elucidated. WNK1 is a member of the WNK family of serine/threonine kinases with no lysine (K), and these kinases have been implicated as important modulators of sodium and potassium homeostasis in the kidney. Aims of the study were to investigate whether WNK1 gene polymorphism are associated with blood pressure variations to dietary salt or potassium intervention.

Methods Based on subjects in population cohort, a 3-day base survey was carried out in 339 normotensive adults in 2004, they were recruited for determination of BP response to sodium or potassium using 7 day low salt- 7 day high salt -7 day high salt plus potassium supplement diet intervention. Genomic DNA was extracted from whole blood using ReadyAmpTM DNA Purification Kit; the genotyping experiments of 5 SNPs of WNK1 were done using ligase detection reactions (LDR), namely rs880054, rs12828016, rs956868, rs2301880, rs765250; Family Based Association Test (FBAT) programme 2.0.2 were used to test the association of single marker or haplotypes and BP responses to dietary sodium or potassium interventions.

Results Statistically significant associations were observed between the genotypes of rs2301880 and SBP, DBP or MAP responses to dietary high sodium interventions; rs12828016and rs880054 were associated with DBP responses to dietary low or high sodium interventions, but not SBP; no association between rs765250 or rs956868 and BP responses to dietary sodium or potassium interventions; BP responses to dietary potassium intervention was not associated with any genotypes.

Conclusions WNK1 gene polymorphisms were associated with blood pressure response to sodium intervention, suggesting that WNK1 gene may be involved in the formation of salt sensitivity, and maybe a new molecular genetic markers of salt sensitivity.

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