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# Hyperfiltration, metabolic syndrome and risk of adverse clinical outcomes

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**Objectives:** Glomerular hyperfiltration and metabolic syndrome increase the risk of cardiovascular disease and all-cause mortality. While hyperfiltration is strongly related to the metabolic risk, it is little known how the combined association of these two factors affects the risk of metabolic syndrome-related complication, CV disease and all-cause mortality.

**Methods:** We reviewed the National Health Insurance Service database of Korea for people who received national health screenings between 2009 and 2011. Hyperfiltration (n = 199,807) was defined as eGFR >95th percentile after stratification for age, sex, height and weight and normal filtration as eGFR 25-75th percentile (n = 2,376,489). Metabolic syndrome was considered as the presence of three or more of the metabolic risks. Individuals were compared based on the presence of hyperfiltration and metabolic syndrome

**Results:** Compared to normal filtration without metabolic syndrome, the co-existence of glomerular hyperfiltration and metabolic syndrome was associated with the greatest risk of hypertension, diabetes and cardiovascular event. Hyperfiltration without metabolic syndrome also increased the risk of diabetes (HR 1.22, 95% CI 1.18-1.27) and hypertension (HR 1.06, 95% CI 1.04-1.07), but it was not associated with higher risk of cardiovascular event (HR 1.04, 95% CI 0.99-1.09). Of four categorized individuals, the risk of all-cause mortality increased highest in those who had hyperfiltration without metabolic syndrome (HR 1.22, 95% CI 1.17-1.28) and there was a significant interaction between hyperfiltration and metabolic syndrome in association with all-cause mortality (*P* for interaction = 0.003).

**Conclusions: :** Our findings indicate that glomerular hyperfiltration was significantly associated with higher risk of hypertension and diabetes, even in the absence of metabolic syndrome. Notably, hyperfiltration without metabolic syndrome was more detrimental to mortality risk than that with metabolic syndrome.