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Why African-Americans are at greater risk of hypertension and kidney disease

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Physician-scientists from NewYork-Presbyterian Hospital/Weill Cornell Medical Center believe that a heightened level a certain growth factor in the blood may explain why blacks have a greater prevalence of hypertension and kidney disease compared to whites. Results from a new study are the first to show that an elevated level of a protein, called transforming growth factor B1 (TGF-B1), raises the risk of hypertension and renal disease in humans.

African Americans constitute about 32 percent of all patients treated for kidney failure in the U.S. and are four times more likely to develop renal disease than whites, according to the National Institutes of Health's U.S. Renal Data System. The researchers' findings, published in this month's issue of the journal *Kidney International*, may someday lead to the development of a new class of anti-hypertensive and kidney disease drugs that target the TGF-B1 protein.

"I believe we may now understand a great puzzle: why the black population has a greater prevalence of hypertension and kidney disease," says Dr. Manikkam Suthanthiran, first author of the study and attending physician at NewYork-Presbyterian/Weill Cornell, Stanton Griffis Distinguished Professor of Medicine, Professor of Biochemistry and Professor of Medicine in Surgery at Weill Cornell Medical College.

Results from the study revealed that the TGF-B1 protein was significantly higher in 186 black study participants compared with 147 white participants.

After controlling for race, sex and age, TGF-B1 protein levels were highest in hypertensive blacks (46 ng/ml). Non-hypertensive blacks also had higher levels (42 ng/ml) compared to hypertensive whites (40 ng/ml) and non-hypertensive whites (39 ng/ml), demonstrating that even healthy black patients may be at higher risk for future hypertension and renal disease compared to healthy and hypertensive whites.

"Many black patients may have a disadvantage from the start -- having a higher baseline level of TGF-B1," says Dr. Phyllis August, senior author and attending physician in the division of hypertension at NewYork-Presbyterian Hospital/Weill Cornell Medical Center, Ralph A. Baer Professor of Medical Research and professor of medicine atWeill Cornell Medical College.

While the exact mechanisms of TGF-B1 require further study, the authors believe that in black patients, higher levels of the growth factor are correlated with lower renin activity -- an enzyme that constricts blood vessels and raises blood pressure. High blood pressure is the leading risk factor for end-stage kidney disease.

The authors believe it may be possible that higher levels of TGF-B1 boost retention of sodium salt within the kidneys, leading to higher blood pressure in the kidney and also lower levels of renin.

Greater levels of TGF-B1 in blacks were also positively associated with body mass index (BMI) -- indicator of body fatness compared to height -- and metabolic syndrome -- a group of abnormalities that is associated with atherosclerotic vascular disease and diabetes.

"Future clinical studies must be done so we may fully understand the specific role of TGF-B1 in how the kidney handles sodium, blood pressure and kidney disease." Says Dr. August.

Source: Columbia University Medical Center (news : web)