Excess protein in urine is indicator of heart disease risk in whites, but not blacks

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The cardiovascular risk that is associated with proteinuria, or high levels of protein in the urine, a common test used by doctors as an indicator of increased risk for progressive kidney disease, heart attack and stroke, has race-dependent effects, according to a new study by researchers at Wake Forest University School of Medicine.

The study appears in the January issue of Diabetes *Care*.

"Proteinuria, a long accepted indicator of heart disease risk, has far less impact on blacks than it does on whites," said Barry Freedman, M.D., John H. Felts III Professor, chief of the Section on Nephrology, and lead researcher on the study. "In the medical community, it is believed that the more protein in a patient's urine, the greater the risk for heart disease and stroke, and this is true - in white populations. Our study indicates that excess protein in the urine - a common finding with progressive kidney disease in individuals with diabetes - is strongly associated with calcium deposition in the major arteries in white patients, but not in black patients. Therefore, proteinuria appears to be associated with an increased risk of heart attack in the white ethnic group. There may be biologic factors predisposing whites to heart disease or protecting blacks from developing it."

In the general community, blacks have more heart disease risk factors than whites, including higher blood pressures and LDL (known as "bad") cholesterol levels, and higher blood sugars in patients with diabetes, Freedman explained. As such, they face a higher risk for heart attack

than whites, he said.

However, several large studies have shown that despite having more risk factors for hardening of the arteries, black men had less calcium in the heart arteries - one-eighth the amount - compared to white men. In addition, given access to equivalent healthcare as whites, blacks with diabetes face only half the risk of a heart attack, indicating that blacks appear to somehow be protected from the cardiovascular effects of these risk factors, Freedman said.

In this study, Freedman and colleagues investigated whether biologic factors protect blacks from heart disease, particularly those with diabetes. They evaluated whether excess protein excretion in the urine - a major heart disease risk factor in whites - was also a risk factor for heart and vascular disease in blacks. The level of urine protein was examined in 835 white participants and 393 black participants, all with diabetes. Participants were also tested for atherosclerosis, based on the buildup of calcium in their major arteries.

The research team found that in the white population, greater amounts of protein in the urine were directly associated with higher levels of atherosclerosis. This association, however, was not seen in the black study population.

"It turns out that urinary protein, an accepted predictor of calcium buildup and risk factor for heart attack that we have long relied upon, is a much stronger indicator in whites than blacks," Freedman said. This finding is important, Freedman added, because blacks with diabetes and kidney failure tend to live significantly longer after starting kidney replacement therapy (dialysis) and suffer fewer heart attacks, compared to whites.

"The vast majority of patients who develop kidney disease and start

dialysis have leaked protein into their urine for many years," Freedman said. "But black patients generally live longer on dialysis, despite having more risk factors - including more protein in the urine - and typically being seen by kidney specialists later in the course of the disease, than their white peers."

The findings present the first report demonstrating that there are ethnic differences in the effect of the accepted cardiovascular disease risk factor "protein in the urine" on development of atherosclerosis. The researchers further propose that there may be inherited factors in whites that contribute to higher risk for vascular disease and heart attack, or protective inherited factors in blacks.

The next phase of this study, called the African American-Diabetes Heart Study, will attempt to identify gene variants that play a protective role against heart disease in blacks and variants that predispose whites to heart disease.

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