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Nephrology: Hemodynamic response to exercise predicts the development of severe renal failure: Revealing a cardio-renal secret cross talk- Ali Reza Khoshdel- University of Newcastle

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Background: Renal Failure, even at an early stage, increases the risk of developing and exacerbating cardiovascular (CV) disease. The corollary of that observation should be that CV disease would not only increase the risk of renal function deterioration, but also cause renal damage, a concept not previously proposed. Aim: Evaluate renal function after follow-up in different levels of hemodynamic response to exercise stress test, as an index of CV function. Method: The hemodynamic response to a graded exercise stress test was measured in 70 candidates to evaluate the association of heart rate and blood pressure change (ΔHR and Δ SBP), heart rate reserve (HRR), chronotropic incompetence (% in achievement of maximal predicted heart rate-%MPHR), and circulatory power (CirP) with the development of severe renal failure (eGFR<30) during a 123 (33-179) month follow-up period. Results: Survival analysis methods demonstrated that the probability of severe renal failure development was greater in subjects with lower levels of ΔHR, HRR, %MPHR and CirP (Log-rank test, P=0.002, 0.01, 0.02, 0.008 respectively). These effects remained significant after multivariate adjustment for age, resting pulse pressure (rPP), hypertension, diabetes and exercise test result using a cox-proportional hazard analysis (Hazard Ratio= 5.9, 2.9, 3.3, 2.9, respectively; all P<0.05). Having an rPP ≥60 was accompanied by 7.4 (95% CI: 1.8-30.9) times greater risk of developing severe renal failure, independent of age and resting SBP (P=0.006). However the data did not show a significant association between Δ SBP and development of severe renal failure. Conclusion: The hemodynamic responses to a standard graded exercise stress test independently predicted the development of severe renal failure. While rPP, an indirect measure of arterial compliance, was a strong predictor for developing severe renal impairment, arterial stiffness may also be a factor linking ventricular and kidney function. The results also suggest that the early diagnosis of kidney disease should include a CV assessment and vice versa

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