

P086

## P086 -Changing protein permeability with nephron loss; evidence for a human remnant nephron effect.

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### Background

If loss of functioning nephrons predisposes to glomerular barotrauma (a 'remnant nephron' effect) then glomerular permeability should increase as glomerular filtration rate (GFR) falls, as observed in animal models.

### Methods

Changes in protein permeability were measured as proteinuria per ml/min of GFR in the setting of nephron loss due to kidney donation (ALTOLD cohort) or progressive CKD (MDRD, AASK and CRIC studies).

### Results

Following kidney donation renal albumin permeability increased by 30% from predonation levels ( $p < 0.001$ ). With progression of CKD a 50% loss of GFR was accompanied by increases in proteinuria per ml/min GFR of 1.8-, 2.1-, and 1.6-fold in the MDRD, AASK and CRIC cohorts respectively ( $p < 0.001$  for all), independent of systolic BP changes and ACE/ARB use. A 70% reduction in residual GFR was associated with permeability increases of 3.1-, 4.4-, and 2.6-fold. Among MDRD participants with progression of nonglomerular primary disease the top quartile of final protein permeability (141mg/ml) would have been equivalent to 'nephrotic range' proteinuria at the baseline GFR of 40ml/min, implying the development of de novo glomerular pathology as GFR fell. In the absence of falling GFR there was no increase in permeability (0.9-, 1.1- and 1.0-fold in MDRD, AASK and CRIC).

### Conclusion

The frequent increase in renal protein permeability occurring with nephron loss even in the absence of primary glomerular disease is consistent with a remnant nephron effect in human CKD.