

Diabetic Nephropathy a Frontier for Personalized Medicine

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Diabetic nephropathy (DNP) develops after latency periods that may vary by several years in approximately one third of patients with diabetes. This diabetic complication is a complex disorder whereby various genetic and environmental factors determine susceptibility and progression to ESRD. Despite rapid research progress, robust predictors to assess prospectively with high precision the risk for DNP in individuals with diabetes are still lacking. Thus, currently available therapies are usually initiated at more advanced stages of DNP characterized by clinically overt manifestations, including increased urinary albumin excretion and decreased glomerular filtration. In addition, although these interventions have proven efficacy in slowing the progression of DNP, they typically cannot prevent ESRD. New insights into the molecular mechanisms that underlie the origin and progression of DNP are emerging rapidly from advanced large-scale genetic and molecular studies in experimental models and humans. Thus, genetic loci that confer risk for albuminuria and/or progression of kidney disease associated with diabetes are being refined to identify the relevant genetic variants in specific genes. Molecular mRNA profiles that are obtained through microarray screens are being validated to elucidate further their potential as molecular markers and to identify new targets for novel preventive or therapeutic approaches aiming at curing DNP. The challenge before the field is to translate the large amount of new genetic and molecular data to empower clinicians and investigators with reliable predictors of DNP for improved design of preventive clinical trials and for individualized clinical management for millions of individuals affected by diabetes worldwide.