

# DIABETIC NEPHROPATHY

FLAME LECTURE: 12

MISTRY 10.18.18

# OBJECTIVES

- ▶ To understand diabetic nephropathy as one of the complications of diabetes
- ▶ Review mechanism of diabetic nephropathy
- ▶ Learn how to screen for diabetic nephropathy
- ▶ Learn how to diagnose diabetic nephropathy
- ▶ Learn how to treat diabetic nephropathy
- ▶ Prerequisites: none
- ▶ See also Flame Lecture:
  - ▶ Type 1 vs Type 2 diabetes
  - ▶ Type 2 diabetes (different diagnoses and goals)

# PATHOPHYSIOLOGY

- ▶ Diabetes can lead to chronic changes in the glomeruli resulting in nephropathy
  - ▶ Mesangial expansion due to advanced glycation end products, growth factors, and cytokines
  - ▶ Thickening of the glomerular basement membrane
  - ▶ Podocyte injury
  - ▶ Hyaline narrowing causing ischemic injury and dilatation of the afferent renal artery leading up with glomerular sclerosis
- ▶ These changes result in glomerular hyperfiltration, glomerular hypertension, renal hypertrophy, and altered glomerular composition
- ▶ This eventually leads to albuminuria and hypertension

# SCREENING FOR NEPHROPATHY

- ▶ When to start:
  - ▶ 5 years after diagnosis of Type I DM
  - ▶ At time of diagnosis of Type II DM
- ▶ How:
  - ▶ First line test: spot urine albumin/creatinine ratio
  - ▶ 24-hour urine protein
  - ▶ Glomerular filtration rate (GFR)
  - ▶ Timed OR overnight urine microalbumin

# DIAGNOSIS

- ▶ Persistent microalbuminuria: positive results on two of three tests (30-300 mg of albumin per G of creatinine) in a six-month period
- ▶ Macroalbuminuria: >300 mg of albumin per G of creatinine
- ▶ GFR: Initially elevated GFR followed by decline
- ▶ Renal biopsy to look for histologic changes described earlier

# TREATMENT

- ▶ Goal: Prevent progression of disease
- ▶ Life-style changes: Low protein diet, smoking cessation, weight loss
- ▶ ACE-inhibitor or ARB for normotensive patients with albuminuria
- ▶ Treat associated conditions
  - ▶ Anemia: screen and treat
  - ▶ Glycemic control: A1c < 7.0 (less stringent goals for those with decreased life expectancy)
  - ▶ Blood pressure control:
    - ▶ First line: ACE inhibitor/ARB
  - ▶ Hyperlipidemia: screen and treat

# RESOURCES

- ▶ Update on Diabetic Nephropathy: Core Curriculum 2018. Umanath, Kausik et al. *American Journal of Kidney Diseases*, Volume 71, Issue 6, 884 - 895
- ▶ **Diabetic Nephropathy—The Family Physician's Role.** Michelle A. Roett, MD, MPH; Sarah Liegl, MD; and Yalda Jabbarpour, MD, Georgetown University Medical Center, Washington, District of Columbia. *Am Fam Physician*. 2012 May 1;85(9):883-889.