eGFR, Timing of Referral and Multidisciplinary Care

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Educational Half Day
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Declarations

- Consults: none
- Speaker bureau/honorarium: Lilly, Boehringer-Ingelheim, Janssen, Shire, Ortho-Biotech Canada, Bristol Myers Squibb, Amgen
- Grants/Research: none
- Other: none
Objectives

- Review eGFR and its interpretation
- Timing of referral
- Goal of Early referral
- Goal of Multidisciplinary CKD care
Case 1 - Proteinuria

- 25 yo male
  - DM 1 x 15 years, retinopathy, malb/Cr 90
  - BP 140/90, LDL 4, Cr 60, eGFR 110

- Do we need more information?
- Is this a high risk patient?
- Does he need to see nephrology?
Case 2 – Hematuria and Proteinuria

- 65 yo female
  - Microscopic hematuria 3-5rbc per hpf
  - 1g/L dipstick proteinuria
  - Aches/pains, mild rash
  - Cr 60, eGFR 80, BP 160/100
- Do we need more information?
- Is this a high risk patient?
- Does she need to see nephrology
eGFR – The meaning

- What is GFR?
  - A true sum total of glomerular filtration

- What is eGFR?
  - An estimate of GFR
  - Uses proteins (Creatinine, cystatin-C) and equations to estimate GFR
  - Uses DTPA and other exogenous markers
eGFR – How to estimate

- **Radioisotope**
  - Inulin – Gold standard (not used)
  - DTPA and Iodothalimate

- **Creatinine**
  - MDRD (Cr, age, gender, race)
    - Valid in GFR < 60ml/min
  - CKD-EPI (Cr, age, gender, race)
    - Valid in both < and > 60ml/min
eGFR – The problems

- Normalized to body surface area
  - Generally use 1.73m²

- Age
  - GFR declines with age (normal process)
  - Loss of 0.4-1.2 mL/min/year after age of 50
eGFR – The problems

- Acute Kidney Injury
  - Changes in eGFR estimates do not reflect true GFR
  - Only way to estimate is radinucleotide scan or urine Cr excretion rates

- Very lean or obese individuals
  - Tend to overestimate true GFR
eGFR – Problems with Cr

- Tubular secretion
  - As GFR declines contribution greater
  - Better to use average of Urea and Cr clearances as an estimate of GFR
Goal of Early Referral

- Patient Education
- Modality Decisions
- Creation and maturation of vascular access
- Delay progression to ESRD
- Cardiovascular disease management
Consequences of Late Referral

- Increased morbidity and mortality
- Anemia
- Hyperparathyroidism
- Cardiovascular Disease
- Increased risk of hospitalization
- Increased health-care costs
- Suboptimal vascular access
- Less informed choice of dialysis modality
Benefits of Early Referral

- Improved biochemical abnormalities
- Fewer hospitalized days
- Increased choice of home modalities
- Increased survival
- Delay onset of ESRD
- Less use of permanent access
Timing of Referral

- Literature suggests:
  - Late is <1 month before ESRD
  - Early is >4 months before ESRD

- Revised definition should be:
  - Refer at least 10 months before ESRD required (preparation time)
When to Refer

Identify patients in your practice at high risk for Chronic Kidney Disease
- Patients with hypertension
- Patients with diabetes mellitus
- Patients with atherosclerotic coronary, cerebral or peripheral vascular disease
- Patients with heart failure
- Patients with unexplained anemia
- Patients with a family history of end stage renal disease
- First nations people

<table>
<thead>
<tr>
<th>eGFR &lt;30</th>
<th>eGFR 30-60</th>
<th>eGFR &gt;60</th>
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<tbody>
<tr>
<td>Consider reversible factors:</td>
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<tr>
<td>- Medication</td>
<td>- Volume depletion</td>
<td>- Individualized follow up and treatment</td>
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<td>- Intercurrent illness</td>
<td>- Obstruction</td>
<td>CKD is diagnosed in this group only if other renal abnormalities are present (i.e. proteinuria, hematuria, anatomical)</td>
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<td>Repeat tests in 2 - 4 weeks</td>
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- eGFR <30
  - Nephrology referral recommended

- eGFR 30-60
  - Follow eGFR at 3 months then serially Assess for persistent significant proteinuria
  - Implement risk reduction

- eGFR >60
  - Stable eGFR 30-60 and no significant proteinuria

Adapted from: Handbook of Chronic Kidney Disease Management, Daugirdas JT Chapter 39, The unfulfilled promise of pre-diaylsis care in Canada. Lebner A, Benaroia M, Mendelssohn D. 2011
When to Refer

- Identify high risk patients
  - Hypertension
  - DM
  - CAD
  - Anemia
  - PVD
When to Refer

- Determine eGFR
  - Stratify according to eGFR
    - <30ml/min
    - 30-60ml/min
    - >60ml/min
  - Look for reversibility in those <60ml/min
    - Volume depletion, medications
    - Do follow-up tests in 2-4 weeks
When to Refer

- Refer when GFR <30ml/min
  - In those where no reversible causes found
- Refer if persistent proteinuria (with risk reduction strategies) and GFR 30-60ml/min
- Refer >60ml/min if proteinuria, hematuria or other unexplained anomalies
- Rapidly progressive disease irrespective of cause
Multidisciplinary Renal Clinic

- Patient-centered care
  - Education
- Goal to delay progression of disease
  - Target CVS disease and lifestyle changes
- Prepare patient for renal replacement
- Specialized consultation
  - Physicians, pharmacists, social workers, dieticians, nurse educators, vascular access, transplant
Benefits of Multidisciplinary Clinics

- Decreased urgent/crash dialysis starts
  - Optimal starts
- Home dialysis as modality
- Optimal vascular access
- Improved
  - blood pressure control, anemia and mineral metabolism
- Fewer hospitalizations, decreased mortality
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Questions?

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