Renal Failure In The Elderly

Claire kennedy
• Extrinsic ageing

• Renal Disease

• Intrinsic ageing
  • Reduced Renal Reserve
  • Blunted Fluid & Electrolyte homeostasis
  • Structural Changes
• ↓ Renal reserve
  • ↓ GFR
  • ↑ BP
  • ↓ number of glomeruli
  • ↑ glomerular sclerosis
  • ↓ renal blood flow
Fluid & Electrolyte homeostasis

- ↓ ability to concentrate & dilute urine
- ↓ response to Vasopressin
- ↓ Renin and Aldosterone levels
- ↓ thirst sensation
- ↓ response to sodium loading and depletion
• **Structural changes**
  
  • ↓ Renal mass
  
  • Distal nephrons develop diverticulae
• Urea & creatinine not reliable markers of renal function in the elderly
  • Urea can change independently to GFR
  • Creatinine related to muscle mass

• GFR is more reliable indicator of renal function
  • 24 hour creatinine clearance
Creatinine clearance (ml/min) = 

\[(140 - \text{Age}) \times \text{weight (kg)}\]

plasma creatinine (umol/l) \times 0.82
(140 – age) x weight

creatinine (umol/l) x 0.82

- 30 yo, 70kg, creatinine 140
- GFR = 67 ml/min (mild failure)
GFR (mL/min/1.73 m²) =

175
× \text{SCr (exp[-1.154])}
× \text{Age (exp[-0.203])}
× (0.742 \text{ if female})
• Acute Renal Failure
• Chronic Renal Failure
• Renal Replacement Therapy
• More common

• Treatment should not be denied on basis of age

• Check renal function regularly in all unwell elderly patients

• Consider stopping ACEI and diuretics during an acute illness
• R  Risk  GFR ↓25% from baseline
• I  Injury  GFR ↓50% from baseline
• F  Failure  GFR ↓75% from baseline
• L  Loss  Loss Renal Function x 4 weeks
• E  ESKD  End Stage Kidney Disease
• Pre-renal
  • Poor renal perfusion

• Renal
  • Direct damage to the kidney
• Dehydration (often a/w sepsis)
• Volume loss (bleeding, over-diuresis)
• Volume redistribution (eg low albumin)
• Poor cardiac output

• Aggravated by many drugs
• Commonly Acute Tubular Necrosis (ATN)
  • Ischaemic
  • Nephrotoxic
  • Pigment

• Rarely
• Obstruction
  • Prostatic enlargement
  • Renal stone
  • Urethral stricture
  • Pelvic tumours
  • U/S : dilated collecting system
- Urea & Creatinine
- Electrolytes
- Arterial Blood Gas
- Inflammatory Markers
- Urine Dipstick
- Urine Microscopy
- Creatine Kinase
- Urinary Sodium
- Chest Xray
- ECG
- Renal Ultrasound
- Others
• Helps distinguish between Acute Tubular Necrosis and volume depletion

• ATN likely >40 meq/l

• Volume depletion likely if <20 meq/l
• Pulse, BP, temperature, cardiac monitor

• Input-Output
  • Incl vomit, drains, faeces, urine
  • May need catheter initially

• Daily weights
- Refractory pulmonary oedema
- Persistent hyperkalaemia (>7mmol/l)
- Worsening acidosis (pH <7.2)
- Uraemic pericarditis
- Uraemic encephalopathy
• More common

• Incidental finding

• Common Causes
  • Hypertension
  • Diabetes
  • Obstruction
<table>
<thead>
<tr>
<th>CKD Stage</th>
<th>GFR (mL/min/1.73 m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90</td>
</tr>
<tr>
<td>2</td>
<td>60-89</td>
</tr>
<tr>
<td>3</td>
<td>30-59</td>
</tr>
<tr>
<td>4</td>
<td>15-29</td>
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</tbody>
</table>
• Treat exacerbating factors
• Modify disease
  • Anti-hypertensives in proteinuric CRF
• Avoid exacerbating factors
• Treat complications
• Prepare for end-stage
• BP control is integral to management of CRF

• ACEI most effective in

  • ↓proteinuria

  • ACEI most effective in slowing rate of decline

• Useful even in advanced CRF

• Other anti-hypertensives can be added as
• Hypertension
• Hyperkalaemia
• Hyperlipidaemia
• Atherosclerosis
• Salt & Water Retention
• Anaemia
• Haemodialysis or Peritoneal dialysis

• Issues
  • Survival
  • Complications
  • Quality of Life
- Demand > Supply
- Increased graft failure rates
  - Altered immune responses
  - Increased side-effects
- Co-morbidities
Thank you!