NEPHROLOGY: Alive and Well

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overview

- SGLT2 Inhibitors and GLP-1 Receptor Agonists: Changing Diabetes Management with CKD
- ACEi/ARB Warnings: Keeping It Straight
- AHA Hypertension Guidelines: No more JNC 8
- Anticoagulation in CKD: DOACs
- The future of hyperkalemia: Beyond Kayexalate
- When to Refer to Nephrology
- Questions

Your question is our question
SGLT2 Inhibitors and GLP-1 Receptor Agonists:
Giving CREDECE to Changes in Diabetes Management and CKD
SGLT2 Inhibitors:
SGLT2 Inhibitors:

1. Cells lining proximal tubule
2. Interstitial fluid → Blood
3. SGLT-2 inhibitors
4. SGLT
5. Sodium-glucose linked transporter (SGLT)
SGLT2 Inhibitors:

CREDENCE TRIAL
Canagliflozin and Renal Events in Diabetes and Nephropathy Clinical Evaluation

- Leading the way: CANVAS Trial (2017)
- CREDENCE OUTCOMES:
  - Reductions noted in:
    - Doubling of creatinine (21 vs 34/1000 P-Y)
    - Progression to ESRD (20.4 vs 30/1000 P-Y)
SGLT2 Inhibitors:

- CREDENCE TRIAL
  - Canagliflozin
- DECLARE
  - Dapagliflozin
- EMPA-REG OUTCOM
  - Empagliflozin

Trouble with the FLOZINS...

- 1) Increased genital and urinary tract infections including mycotic infections
- 2) Necrotizing fasciitis of the perineum (Fournier’s gangrene)
- 3) Pancreatic Cancer
- 4) 1 and 2
Trouble with the FLOZINS...
The results are mixed:

2016 CANVAS TRIAL
OBSERVE-4D
JOHNS HOPKINS

GLP-1 Receptor Agonists
Glucagon-like Peptide Agonists

- ELIXA TRIAL
- LEADER TRIAL (Liraglutide)
  - Significant reduction in:
    - CV mortality
    - Nonfatal MI
    - Nonfatal stroke
GLP-1 Receptor Agonists
Mechanism Of Action

WORKS IN 3 WAYS

1. GLP-1 receptor (G-protein coupled)
2. Heterotrimeric G-protein
3. Nucleus

Incretin effect: GLP-1 stimulates insulin secretion.

GLP-1 helps the pancreas produce more insulin when your blood sugar levels are high.
GLP-1 Receptor Agonists
Glucagon-like Peptide Agonists

- ELIXA TRIAL
- LEADER TRIAL
  - Liraglutide
  - REWIND Trial
  - AWARD 7 Trial

Trouble with the GLP1 Agonists is...

- 1) Pancreatic Cancer
- 2) Hepatocellular Carcinoma
- 3) Renal Cell Carcinoma
- 4) None of the Above
Diabetic Nephropathy: Hyperfiltration and Proteinuria

Hyperfiltration Studies for ACEi and ARBs

Why No ACEi + ARB Hyperfiltration
The Basics of Diabetic Nephropathy:

PROTEINURIA

Hyperfiltration

Studies for ACEi and ARBs

Why No ACEi + ARB

Proteinuria on the Glomerular Level

Key Trials in Diabetic Nephropathy

- RENAAL Trial
- Irbesartan Diabetic Nephropathy Trial (IDNT)
- ONTARGET
- ALTITUDE (Aliskiren + ACE or ARB)

overview

- ACEi/ARB Warnings: Keeping It Straight
ACEi/ARB Warnings: Keeping It Straight

Recalls of Angiotensin II Receptor Blockers (ARBs) including Valsartan, Losartan and Irbesartan

Get current information about recalls of blood pressure medications

When To Stop the ACEi/ARB
AHA Hypertension Guidelines: No more JNC 8

Normal: <120/80mmHg
Elevated: Systolic 120-129 and diastolic <80
Stage 1: Systolic 130-139 or diastolic 80-89
Stage 2: Systolic 130-139 or diastolic at least 90mmHg
Guide eliminates category of prehypertension

All direct oral anticoagulants are metabolized in some capacity by what organ?

1) The KIDNEYS
2) The brain
3) The lungs
4) None of the above

**FIGURE 1** Degree of renal clearance of direct oral anticoagulants (DOACs)

Anticoagulation in CKD and ESRD: DOACs
TABLE 1  Society guidelines for anticoagulation in AF by CKD stage

<table>
<thead>
<tr>
<th>CKD stage</th>
<th>AHA/ACC/HRS</th>
<th>ESC</th>
<th>CCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild to moderate Stages 2-3 (eGFR 50-90 mL/min/1.73 m²)</td>
<td>Warfarin (class I, LOE A) DOACs (class 1, LOE B) with dose adjustment for moderate CKD (class IIb, LOE C)</td>
<td>DOACs recommended in general (mild to moderate CKD not mentioned)</td>
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</tr>
<tr>
<td>Severe Stage 4 (eGFR 15-29 mL/min/1.73 m²)</td>
<td>Warfarin recommended, DOACs may be considered (class IIb, LOE C)</td>
<td>Anticoagulation may safely be given (specific drugs not mentioned)</td>
<td>Warfarin recommended</td>
</tr>
<tr>
<td>End stage renal disease Stage 5 (eGFR &lt;15 mL/min/1.73 m² or on hemodialysis)</td>
<td>Warfarin recommended (class IIa, LOE B)</td>
<td>No specific recommendation given</td>
<td>Cannot recommend routine anticoagulation for dialysis patients due to lack of data</td>
</tr>
</tbody>
</table>

Abbreviations: ACC, American College of Cardiology; AF, atrial fibrillation; AHA, American Heart Association; CCS, Canadian Cardiovascular Society; CKD, chronic kidney disease; DOAC, direct oral anticoagulant; eGFR, estimated glomerular filtration rate; ESC, European Society of Cardiology; HRS, Heart Rhythm Society; LOE, level of evidence.

Major trials in DOACs
overview

- The future of hyperkalemia: Beyond Kayexalate
- When to Refer to Nephrology

Safe Horizons for Hyperkalemia

We're a little concerned about your potassium levels.
What’s New?

- PATIROMER (Veltassa, Relypsa)
- ZIRCONIUM CYCLOSILICATE (Lokelma)

When Does Your Patient Need a Nephrologist?

- CKD
- ESRD
- Hyponatremia
- Hypertension
- Proteinuria
- Hematuria
- Edema
- Hyperkalemia
PRIMARY MEMBRANOUS NEPHROPATHY

Rituximab or Cyclosporine in the Treatment of Membranous Nephropathy


The NEW ENGLAND JOURNAL of MEDICINE
Thank you.
QUESTIONS