Nephrology Updates & Review

Mark Cook, D.O.
Pikes Peak Nephrology

Thank you!
- American Osteopathic Association
- Drs. William Mayo & Robert Burns
- Dr Bruce Wolf & the ROME Planning Committee
- Attendees
- Students
- 20% of US physicians will be D.O. by 2030.

My Background
- Ohio State University College of Pharmacy
- Hospital Pharmacist, Doctor’s Hospital, Columbus, OH
- LECOM (Lake Erie College of Osteopathic Medicine)
- CCF Surgical Internship
- CCF Internal Medicine Residency
- OSU (Go Buckeyes) Nephrology Fellowship
- Pikes Peak Nephrology, Colorado Springs, CO
Focus Points

• How to screen & when to refer
• Diabetes, diabetic kidney disease, new trials
• Kidney stones
• Gout
• ADPKD treatment update
• Fun with Fluids & Electrolytes

Focus Points

• Hypertension Guidelines Update
• Lupus & the Kidney
• ANCA Vasculitis Update
• Transplant updates
• What's the deal with Cystatin C?
• The horizon of Nephrology

Difficult job, this updating business...

Over 2000 published articles in Nephrology in the last year!
69 reviewed journals
JASN, CJASN
AJKD, NEJM
Diabetes Care
“Australian pig steals beer from campers, gets drunk and fights cow.”

How to screen for CKD

- 10% have it & know it, another 10% have it & don’t.
- Urine testing
- Kidney imaging

When to refer?

- A. When the scr >= 2?
- B. When you are simply not comfortable?
- C. When the micro albumin turns positive?
- D. Right before they need dialysis?
- E. When they’re on four or more BP medications?
The Renal Pentad

- Standard of care
- Decreased CKD Progression
- No change in mortality
- When & how to wean
- CKD-4 & RAAS blockade, slippery slope (CHF versus HTN)
- eGFR < 50 ml/min, Scr ≥ 1.8 (2.0) ladies & gentlemen.
- Rely on your nephrologists
- Eplerenone > Spironolactone?
- Which ARB is best?
Statins in CKD-5 / ESKD

- Debatable.
- Who’s right? (you are always right)
- Algorithms are for people who don’t think.
- Maybe talk to the patient (there’s a novel idea).

Diabetes & Kidney Health

- Inhibitors of SGLT2 (sodium-glucose co-transporter 2)
- The latest and greatest?
- Journal American Heart Association
- > 350,000 patients

SGLT2 Inhibitors: Efficacy

- Significant Reduced cardiovascular mortality
- Decreased hospitalizations for CHF
- Retards progression of diabetic glomerulosclerosis
- Promotes natriuresis
SGLT2 Mechanism

- SGLT2 main site for filtered glucose reabsorption
- Inhibits SGLT2 in the proximal renal tubules promoting excretion of filtered glucose, reducing serum glucose

SGLT2 Agents

- About $600/month out of pocket
- Canagliflozin (invokana) 300 mg (100 mg in CKD-3)
- Empagliflozin (jardiance) 25 mg (10 mg in CKD-3)
- Discontinue in CKD-4+

SGLT2 Issues to Consider

- Necrotizing Fasciitis of Perineum (Fournier’s Gangrene)
- Acute pancreatitis
- Ketoacidosis (fatalities)
- UTIs & yeast infections
- Worsened cholesterol profile
- Hypotension (volume depletion)
- AKI
- Stop before moderate-severe surgical risk!
Don’t get me started..

- Generics are great!
- Healthcare as a right, not a privilege.
- One big bad guy to tweak.
- For the President and the prisoners.
- New Colorado legislation for illegal status patients needing dialysis.

Glucagon-like Peptide-1 Analogue (GLP-1, an incretin hormone)

- Liraglutide (saxenda, victoza)
- Decreased stroke risk & cardiovascular mortality
- Reduction in all cause mortality!
- Decreased Diabetic kidney disease progression
- Daily SQ injection (ouch)
- Thyroid c-cell tumor risk
- Leave it up to the endocrinologist?

Abbott’s Freestyle Libre Continuous Glucose Monitor (CGM)

- Medicare to start covering “select seniors”
- 14 day wear
- Delayed equilibration may give false low results when GS climbing
- Less accurate in the lower glucose range
- Cost $1000 - $2000 initial cost and expensive ongoing supplies.
Abbott’s Freestyle Libre

Metformin

- Love it or leave it
- Decreases liver glucose production
- Decreased intestinal glucose absorption
- Improves insulin sensitivity

Metformin Dosing in CKD

- Severe acidosis
- Resistant bradycardia
- Cardiovascular collapse
- Respiratory arrest
- No in CKD-4+
- 500 mg BID okay in CKD-3, usually
Remind your patients

- Hold when sick or dehydrated
- RAAS inhibitors (ACEi, ARB, aldosterone antagonists)
- Metformin
- Diuretics
- NSAIDs suck
- Water before labs!
- To pee or not to pee, that is the question.

Fun with kidney stones

- More than 1 occurrence?
- Screening for PTH, uric acid
- 24 hr urine testing (Litholink)
- Low sodium diet
- Low oxalate diet
- Water!

What’s New with Gout?

- Uric acid goal < 6
- Febuxostat > Allopurinol and also much more expensive...
- Canakinumab (Ilaris) a long acting anti-anti-interleukin (IL)-1 monoclonal antibody.
- SQ injection q 3 months.
- Safe to use in kidney disease
- Prevents gout for only $20,000 / vial..
Diet & Exercise

- No pill greater
- 20 minutes a day is magic
- Less cows & pigs, more birds & fish
- Salty Six (restaurant, processed, pickled, pizza, bread & soup)
- Drink a cup of water upon awakening, when you eat & when you pee.

ADPKD Treatment Update

- 80% ADPKD-1 (chromosome 16)
- 20% ADPKD-2 (chromosome 4)
- Up to 25% spontaneous development?
- RAAS inhibition
- Tolvaptan (jynarque, samsca) ~ $300 / tablet!
- Slows progression of ADPKD
- Hepatotoxicity risk
- Can but probably ought not use in CKD-4 (Cf CKD-5+)

Fun with Fluids and Electrolytes

- Hypernatremia
- Hyponatremia
- Hyperkalemia
- Hypomagnesemia (PPI)
- Hypercalcemia (Vitamin D supplementation)
Hypertension Updates

- What's the new goal?
- Well.. I say it's 110-130/60-80.. usually..
- Age considerations
- Agents of choice
- Resistant hypertension
- Expensive Brand Combo HTN pills generally are bogus
- Losartan and Lisinopril do not cause cancer..

Who to believe?

- Cooks in the kitchen (PCP, cardiology, nephrology)

Hypertension

- When to punt and who to punt to.
- The art of Clonidine
- Minoxidil is for nephrologists
- When to make the thiazide to loop diuretic leap.
- ACEi & ARBs don't like each other
- ACCORD data & what to do bout the "creatinine bump" (>30%)
- The dusky days of Lisinopril
- Teach them how to check BP correctly
How to check BP correctly

- Check a resting BP once a month, once a week, once a day, twice a day, more?
- Three minutes is easy yet difficult
- Arm versus wrist monitors
- Empty bladder
- Legs uncrossed
- Before dinner

Edema control

- Low sodium diet
- Diuretics and water intake
- Compression hose and elevation
- No NSAIDs
- Eliminate the restaurants
- Daily morning weights
- Which diuretic to chose
- DASH diet
- Eplerenone > Potassium

Secondary Hypertension

- Oral contraceptives
- NSAIDs
- Anti-depressants (all of them, some worse than others)
- Steroids
- Decongestants
- Tacrolimus
- Atypical anti-psychotics
Secondary Hypertension

- Drugs (especially meth > cocaine)
- OSA
- Renovascular hypertension (atherosclerosis, fibromuscular dysplasia), what to do?
- Thyroid disorders (high & low)
- Hyperparathyroidism
- Cushing’s
- Pheochromocytoma (zebra extraordinaire)

Salt sensitive hypertension

- Failure to excrete sodium? no...
- New concept: vascular problem
- Vascular problem, not sodium restriction
- Salt-sensitive patients have a vascular dysfunction
- Increased vasoconstriction (increased renovascular resistance) in the salt sensitive patients
LN Classification Update

- Kidney International 4/2018
- Modified NIH LN activity & chronicity scoring system

AKI

- Now a clear risk factor for CKD and proteinuria
- Chronic metabolic acidosis contributes to CKD progression.
- Goal bicarbonate 24-26.
- Excessive ammonia production by kidney to counter metabolic acidosis
- Upcoming: TRC101, non-absorbed hydrochloric acid binder (sodium free)
- Also consider Potassium citrate (urocit-K)

FGF-23

- Bad news agent, especially when rapidly rising
- Circulating peptide involved with phosphate metabolism
- Increased mortality (increased Hazard Ratio of Death)
AVF and the Heart

- Maybe
- Lower arm AVF better (if able)
- Blood flow monitoring and options (plication / ligation)
- Back-up AVF in PD patients (not in CHF patients, lower arm fistula candidates)

Hematuria

- Gross hematuria (all downhill after 40)
- Microscopic hematuria

ANCA Vasculitis

- GPA (90% anti-PR3)
- MPA (90% anti-MPO)
- Mixed (Levamisole / Cocaine)
- anti-GBM (~33% variable positivity)
- Hydralazine, Propylthiouracil, INH
- Allopurinol, Indomethacin
Rituximab (rituxan) in ANCA

- Better than Cyclophosphamide
- MAINRITSAN study
- 1g IV infusion x 2 doses 14 days apart
- Maintenance regimens

HCV & CKD
Kidney Transplant

- Decreases wait time significantly
- Wait time 6-12 months versus 5-7 years
- Does not increase risk of kidney rejection
- Reduces overall costs

Transplant Updates

- HCV + to - ??
- Open labeled non-randomized ten patient trial
- Used Grazoprevir & Elbasvir
Transplant Updates

- [uchivingdonor.org](http://uchivingdonor.org)
- Europe has the right idea (implied consent)
- 75% graft survival at 5 years
- Average kidney transplant lifespan ~ 10-12 years
- Now B can take A or AB kidneys
- Blood type B the longest wait time

Transplant Updates

- More with gut microbes, increased post transplant infections (UTI)
- Escherichia & Enterococcus
- Most UTIs = worst gut dysbiosis
- Cranberry extract, Probiotics & Water

What’s About Cystatin C?

- Low molecular weight protein
- Filtered at glomerulus & not reabsorbed
- Unaffected by gender, age & muscle mass
- Precision may be worse
- Reduce false + but increase false -
- Cost of testing Cystatin C will decline ($20/lab versus $2/lab)
- Both may be best
Early versus Late Referral

• Slows CKD progression
• Reduces complications
• Smoother transition to transplant (pre-emptive)
• Smoother transition to RRT
• Less TDCs, more AVFs

The Horizon of Nephrology
Futures options for CKD & ESKD

Nondihydropyridine CCBs

• Diltiazem may lower diabetic CKD progression
• May increase fibrosis but not if given with ARB
RENAAL TRIAL

- > 1500 patients
- Mean SCr 1.9
- Losartan lowers CKD progression & reduced ESKD risk independent of BP lowering effect

Bardoxolone Fizzle

- BEAM to BEACON trial results
- Antioxidant inflammatory modulator
- BEACON stopped early for safety concerns
- Increases eGFR but also BP and albuminuria (sodium retention)

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