American Kidney Fund®

Hepatitis C and Kidney Disease

Elaine Ku, MD

Thanks to our speaker!

Dr. Elaine Ku

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- Director of the Nephrology Transition Clinic, which focuses on helping adolescents and young adults transition to adult care.
- Dr. Ku sees kidney transplant and chronic kidney disease patients in her clinic.

Outline

- The relationship between hepatitis C and kidney disease.
- The treatment options for hepatitis C in kidney disease patients who are on dialysis or not on dialysis
- How the new medicines that cure hepatitis C have expanded options for patients needing a kidney transplant.

Hepatitis C (hep C)

- Viral infection
  - Different viral strains (genotypes)
- Often has no symptoms but the infection stays in the body of most patients who are affected
- Sometimes it is detected with:
  - Liver disease
  - Kidney disease
  - Multi-organ symptoms

How hep C spreads and screening

- Transmission (how it spreads)
  - Blood transfusions
  - Sexual intercourse
  - Sharing needles
- Screening
  - Hepatitis C antibody
  - Hepatitis C RNA (viral load)
  - Should be performed in all patients receiving maintenance dialysis or kidney transplant

Prevalence of hepatitis C in patients with kidney disease

- Affect 5-10% of the US dialysis population, as high as 14% worldwide
- Affects 1.5-8% of the kidney transplant population
- The amount of dialysis patients with hep c is going down
  - Reductions in transfusion rates
  - Standard precautions for prevention of blood-borne infections

Symptoms of kidney disease associated with hepatitis C

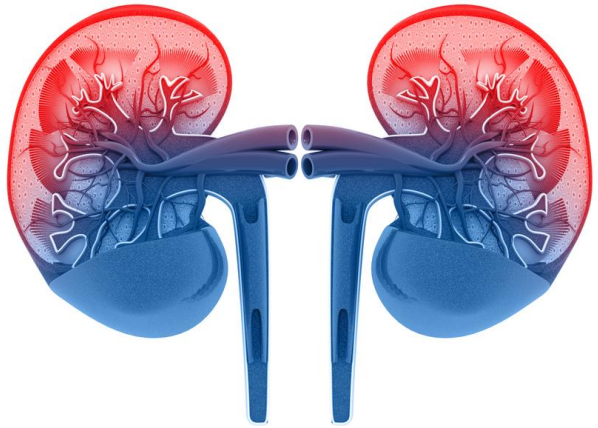
- Blood in the urine
- Protein in the urine
- Abnormal kidney function
- Might not show symptoms

Types of kidney disease associated with hepatitis C infection

- Many types of glomerular disease are associated with hepatitis C infection
  - Cryoglobulinemia (skin rash, neuropathy)
  - Membranous nephropathy
  - Immune complex glomerulonephritis
  - Polyarteritis nodosa

Pathogenesis (how a disease develops)

- Hepatitis C virus triggers the immune system to become more active
  - Formation of deposits in the kidney
  - Can lead to active inflammation in the kidney and other organs



Reasons for treatment

- Prevent liver complications
- Decrease the immune system activity so that deposits don’t build up and damage the kidney
- Prevent complications of hep C after kidney transplant

Treatment options for hepatitis C in kidney disease patients who are not on dialysis

Treatment

- If eGFR is greater than 30 (mild to moderate renal impairment), recommend treating hepatitis C with medicines called direct antiviral agents (DAAs)
  - Treatment is similar to that of patients without kidney disease in the general population
  - Some dosing adjustments may be needed for certain medicines

Treatment

- If eGFR if less than 30, the decision to treat hep C may be individualized depending on:
  - Life expectancy
  - Likelihood of kidney transplant
  - Other medical conditions
  - Strain of hepatitis C that an individual is affected with (genotype 1 and 4 has very good regimens for treatment)
  - How serious liver damage is

Older Treatment Regimens

- Prior treatment regimens
  - Interferon ± ribavarin
  - Affected kidney transplant (increased risk of rejection)
- Not always effective; relapse common in patients with kidney disease
- Half of patients achieved sustained virologic response (cure), defined as hep C RNA clearance 6 months after finishing antiviral treatment

Older Treatment Regimens

- Associated with many side effects
  - Depression
  - Anemia
  - General feelings of sickness or discomfort
- May be only option in countries where newer hepatitis C treatment agents are not available

Newer treatment regimens for HCV

- Direct acting antiviral agents
  - Some aren't processed by the kidney, so they can be used in advanced CKD or for patients on dialysis.

Newer treatment regimens

- High rates of cure (greater than 90%)
- For glomerulonephritis related to hep C:
  - Immunosuppression may still be needed to treat the inflammation from activated immune system
  - Recommended that patients undergo treatment for mild or moderate glomerular disease not requiring immunosuppression

Newer treatment regimens

- If there is a need for immunosuppressive medications, may delay treatment of hepatitis C by 1-4 months until after immunosuppression is initiated
  - Minimize side effects
  - Increase chance of patients tolerating immunosuppression and hepatitis C treatment regimen

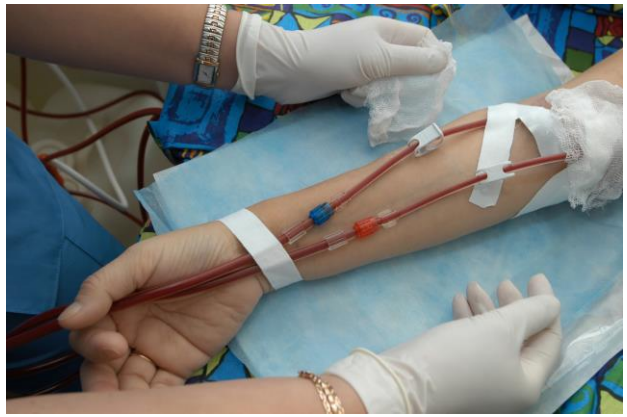
Side effects of treatment

- Generally well tolerated
  - Small risk of worsening renal function
  - Anemia

Treatment options for hepatitis C in kidney disease patients who are receiving dialysis

Hepatitis C and dialysis patients

- Common in the dialysis population
- Hepatitis C will not prevent kidney transplantation
- Patients with hepatitis C do better with kidney transplant than with dialysis
  - Higher risk of complications in patients with kidney transplant if they are hep C positive compared to hep C negative



Treatment regimen in advanced CKD or dialysis patients

- EXPEDITION – 4 year study of a direct antiviral agent had more than 100 patients with eGFRs less than 30. About 80 patients on dialysis.
  - 98% cure with 12 weeks of treatment.

Treatment regimen in advanced CKD or dialysis patients

- C-SURFER study of another direct antiviral agent had more than 100 genotype 1 patients with eGFR less than 30. About 75 patients on dialysis.
  - 94% cure with 12 weeks of treatment.

Treatment options for hepatitis C in kidney transplant candidates

Hepatitis C in potential kidney transplant recipients

- Routine to screen for hepatitis C in potential kidney transplant recipient
- Should undergo liver biopsy before kidney transplantation to rule out cirrhosis (gold standard)
  - May change decision regarding kidney versus combined kidney-liver transplant
- Alternatively, undergo scan for fibrosis

Candidate for living donor transplant

- Treat hepatitis C in patients with living donors prior to kidney transplantation

Timing of treatment for candidates for deceased donors

- If kidney transplant candidate, should treat hepatitis C before transplant if there are acute indications, or if center does not accept hepatitis C positive deceased donors
- Alternatively if no acute symptoms (e.g. liver disease) for treatment, could wait until after kidney transplant and accept a hep C positive donor
  - may decrease waitlist time and risk of death

Timing of treatment for potential kidney transplant recipient

- Safety of delaying hepatitis C treatment depends on
  - expected time until transplantation
  - the degree of liver disease
  - presence of other organ involvement outside of liver
- Decision for treatment may also be dependent on genotype

Treatment in transplant candidates

- In the US, wait time can be less than one year for an hep C-positive organ but more than five years for an hep C-negative organ
- Even if receipt of a hep C-infected donor organ results in two different hep C genotypes post-transplant, both infections can be easily treatable

Treatment in the transplant candidate

- If there is…
  - advanced or rapidly progressive liver disease
  - severe symptoms or involvement of organs outside of the liver
  - anticipated prolonged wait on the deceased-donor waiting list
- Good reasons to treat before kidney transplantation

Treatment regimens

- Hep C genotype 1 or 4:
  - Multiple drug regimens are available
  - Antiviral therapy can be given before or after transplantation

Treatment regimens

- In patients who do **not** have hep C genotype 1 or 4 infection and have eGFR less than 30 may want to postpone antiviral therapy until **after** transplantation.
  - Due to less effective drug therapies targeting other genotypes in those with reduced kidney function
- The only other available interferon-free regimens for genotypes 2, 3, 5, and 6 are sofosbuvir based.

Complications of hepatitis C in the kidney transplant recipient

- Liver disease
- Hepatitis C-related kidney disease in the new transplant kidney
- New onset diabetes after transplant
  - Abnormal glucose metabolism related to hepatitis C infection
- Cancers after transplant

Treatment after transplant

- All patients with HCV infection should receive antiviral therapy after kidney transplant ideally while the eGFR is greater than 30
  - Should wait until immunosuppressive regimen is stable
- No dose adjustment for renal function is required in patients with eGFR greater than 30 for the direct-acting antiviral agents

Immunosuppressive treatment with concurrent hep C treatment

- Beware of cyclosporine and hepatitis medication interactions
- Some regimens have worse drug interactions than others

Long term health of hepatitis C infected kidney transplant recipients

- Some pooled studies showing a 70% higher risk of death among hepatitis C infected patients with kidney transplant
- Risk of kidney rejection was also higher for HCV-infected recipients by about 55%

Questions?

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Director of Nutrition Services at Satellite Healthcare

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