Scleroderma and the Kidneys

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No disclosures
Overview

- What do the kidneys do?
- What happens when the kidneys don’t work?
- How does scleroderma affect the kidneys?
Urine is made by the kidneys. It passes from the kidneys into the bladder through two tubes called the ureters. Then it leaves the bladder through another tube, called the urethra.
Function of the kidneys

- Filter blood and remove:
  - Water
  - Waste products
  - Salts – mainly potassium
  - Drugs
Measuring Kidney Function

How do we measure kidney function?

- Check blood for levels of creatinine
- Creatinine is a waste product cleared by kidneys
- If kidneys are not working, the levels will go up in the blood
Kidney Failure

What happens when the kidneys stop working?

1) Fluid Overload
2) Waste product/toxin build-up
3) High blood levels of potassium
4) Anemia
5) Drug toxicities
Fluid Overload

- Kidneys cannot make urine
- Urine amount decreases
- Water backs up in the body
  - Swelling, starts with legs
  - Fluid in the lungs can cause shortness of breath, especially when lying flat
Toxin build-up

- Kidneys cannot clean the blood
- Toxins build-up in the blood
- Harmful effects on other organs
- Symptoms
  - Nausea
  - Vomiting
  - Fatigue
  - No appetite
High Potassium

- Kidneys cannot get rid of potassium
- High potassium levels in the blood can cause the heart to stop beating resulting in death
- Often no symptoms other than weakness
- High potassium foods
  - Oranges, bananas, melons
Anemia

- Kidneys are also responsible for making the hormone erythropoietin (Epo)
- This in turn makes blood cells
- Kidney failure will cause anemia (low hemoglobin levels) over time
Drug Toxicities

- Many drugs are excreted by the kidneys
- Kidney failure can result in toxic levels of certain drugs if doses are not adjusted
Kidney Failure

- Kidney failure is a silent disease
- Symptoms appear only when there is almost no function left
  - Nausea/vomiting
  - Fatigue/lethargy
  - Decreased appetite
  - Dropping urine output
  - Widespread itchiness
Treatment

How do we treat kidney failure?

1) Treat the cause of the kidney disease
2) Replace the kidney function, i.e. dialysis or transplant
What is dialysis?

Two types of dialysis

1) Hemodialysis
2) Peritoneal dialysis
Hemodialysis
Hemodialysis

- Usually 3 times per weeks
- Each session is 3 to 4 hours
- Usually done in hospital
- Some patients do this at home
Peritoneal Dialysis

Clean Solution

Old Solution
Transplant

Living donor

Donor’s kidney

Kidney transplanted in recipient

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Complications
Scleroderma and the kidneys

- Most common form of kidney involvement is **scleroderma renal crisis**
  - Renal = kidneys
Scleroderma Renal Crisis

- Sudden kidney failure
- Occurs in 5 to 20% of patients
- Most often occurs within 4 years of diagnosis
- In rare cases scleroderma can first present with kidney failure
- Majority have very high blood pressures
  - But people with “normal” blood pressures can develop this as well
- Symptoms occur if kidneys fail completely
Scleroderma Renal Crisis

- Treatment - aggressive blood pressure control
- Blood pressure is treated with ACE inhibitors
- Prior to ACE inhibitors:
  - 75% of patients would die (compared to ~15% now)
  - 0% would have kidney recovery
Scleroderma Renal Crisis

- 2/3 of people who get this will need dialysis
- 30-50% of those needing dialysis will eventually be able to come off of dialysis
Scleroderma Renal Crisis

Prevention

- Unfortunately no way to prevent this
- ACEi only treat it once it develops, but have not been shown to prevent it in studies
What can you do?

- Monitor your blood pressure routinely
  - If blood pressure is unusually high for you for >2-3 days consistently, consult your physician.
Summary

- Kidneys filter the blood and remove waste products, salt and water
- Kidney failure is a silent disease
- Scleroderma can cause acute kidney failure
- No way to prevent it
- Treatment goals are early recognition and blood pressure control