Lupus nephritis in pregnancy

19% of women with lupus will have adverse pregnancy outcomes related to disease (preterm birth, fetal growth restriction, IUFD)

3-5% of women with lupus have severe lupus flare during pregnancy, up to 33% will have mild flares

Risk factors for poor outcome:

- -- active disease <1 year prior to conception
- -- history of lupus nephritis
- -- antiphospholipid antibodies
- -- discontinuation of immunosuppression during pregnancy (esp. hydroxycholorquine)
- -- hypertension prior to pregnancy

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Gonzalez Suarez et al, "Renal Disorders in Pregnancy: Core Curriculum 2019" *AJKD* 2019; 73(1): 119-130.
Bajpai et al, "Evaluation and Management of Hypertensive Disorders of Pregnancy" *Kidney 360* 2023; 4:1512-25.

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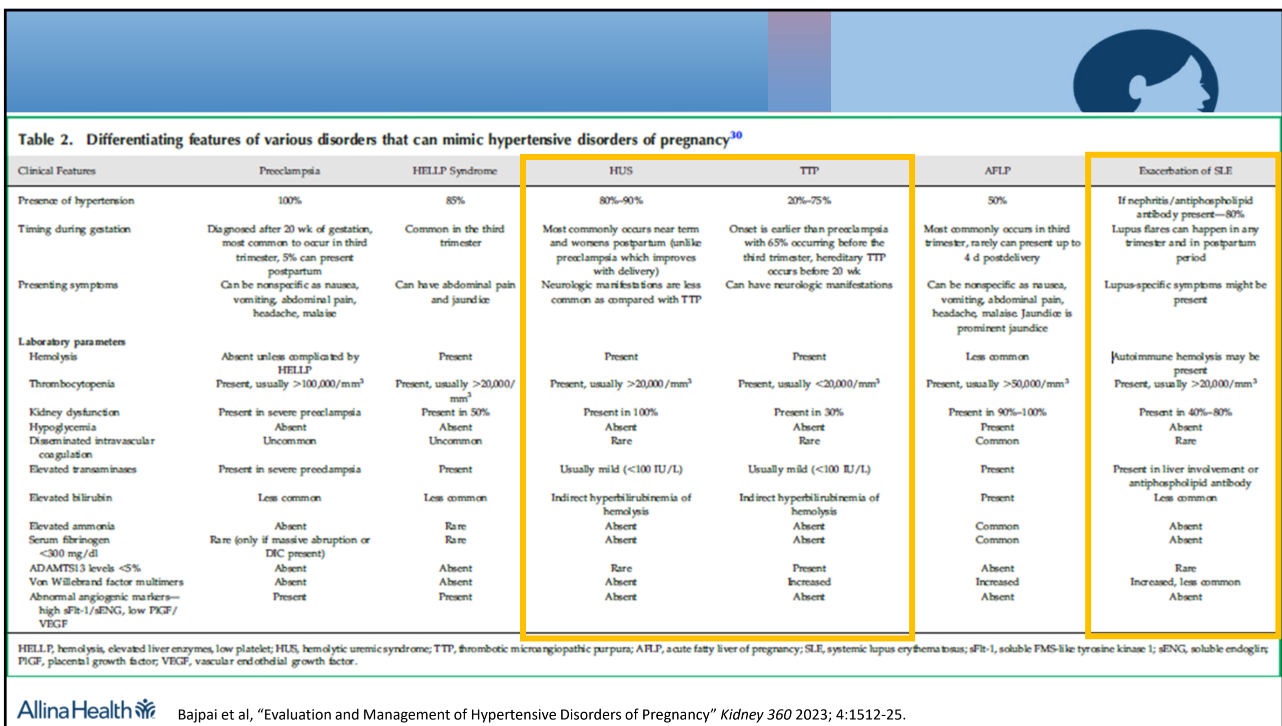

Table 2. Differentiating features of various disorders that can mimic hypertensive disorders of pregnancy[30]

Clinical Features	Preeclampsia	HELLP Syndrome	HUS	TTP	AFLP	Exacerbation of SLE
Presence of hypertension	100%	85%	80%–90%	20%–75%	50%	If nephritis/antiphospholipid antibody present—80%
Timing during gestation	Diagnosed after 20 wk of gestation, most common to occur in third trimester, 5% can present postpartum	Common in the third trimester	Most commonly occurs near term and womens postpartum (unlike preeclampsia which improves with delivery)	Onset is earlier than preeclampsia with 65% occurring before the third trimester, hereditary TTP occurs before 20 wk	Most commonly occurs in third trimester, rarely can present up to 4 d postdelivery	Lupus flares can happen in any trimester and in postpartum period
Presenting symptoms	Can be nonspecific as nausea, vomiting, abdominal pain, headache, malaise	Can have abdominal pain and jaundice	Neurologic manifestations are less common as compared with TTP	Can have neurologic manifestations	Can be nonspecific as nausea, vomiting, abdominal pain, headache, malaise. Jaundice is prominent jaundice	Lupus-specific symptoms might be present
Laboratory parameters						
Hemolysis	Absent unless complicated by HELLP	Present	Present	Present	Less common	Autoimmune hemolysis may be present
Thrombocytopenia	Present, usually >100,000/mm^3	Present, usually >20,000/mm^3	Present, usually >20,000/mm^3	Present, usually <20,000/mm^3	Present, usually >50,000/mm^3	Present, usually >20,000/mm^3
Kidney dysfunction	Present in severe preeclampsia	Present in 50%	Present in 100%	Present in 30%	Present in 90%–100%	Present in 40%–80%
Hypoglycemia	Absent	Absent	Absent	Absent	Present	Absent
Disseminated intravascular coagulation	Uncommon	Uncommon	Rare	Rare	Common	Rare
Elevated transaminases	Present in severe preeclampsia	Present	Usually mild (<100 IU/L)	Usually mild (<100 IU/L)	Present	Present in liver involvement or antiphospholipid antibody
Elevated bilirubin	Less common	Less common	Indirect hyperbilirubinemia of hemolysis	Indirect hyperbilirubinemia of hemolysis	Present	Less common
Elevated ammonia	Absent	Rare	Absent	Absent	Common	Absent
Serum fibrinogen <300 mg/dl	Rare (only if massive abruption or DIC present)	Rare	Absent	Absent	Common	Absent
ADAMTS13 levels <5%	Absent	Absent	Rare	Present	Absent	Rare
Von Willebrand factor multimers	Absent	Absent	Absent	Increased	Increased	Increased, less common
Abnormal angiogenic markers—high sFlt-1/sENG, low PIGF/VEGF	Present	Present	Absent	Absent	Absent	Absent

HELLP, hemolysis, elevated liver enzymes, low platelet; HUS, hemolytic uremic syndrome; TTP, thrombotic microangiopathic purpura; AFLP, acute fatty liver of pregnancy; SLE, systemic lupus erythematosus; sFlt-1, soluble FMS-like tyrosine kinase 1; sENG, soluble endoglin; PIGF, placental growth factor; VEGF, vascular endothelial growth factor.

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Bajpai et al, "Evaluation and Management of Hypertensive Disorders of Pregnancy" *Kidney 360* 2023; 4:1512-25.

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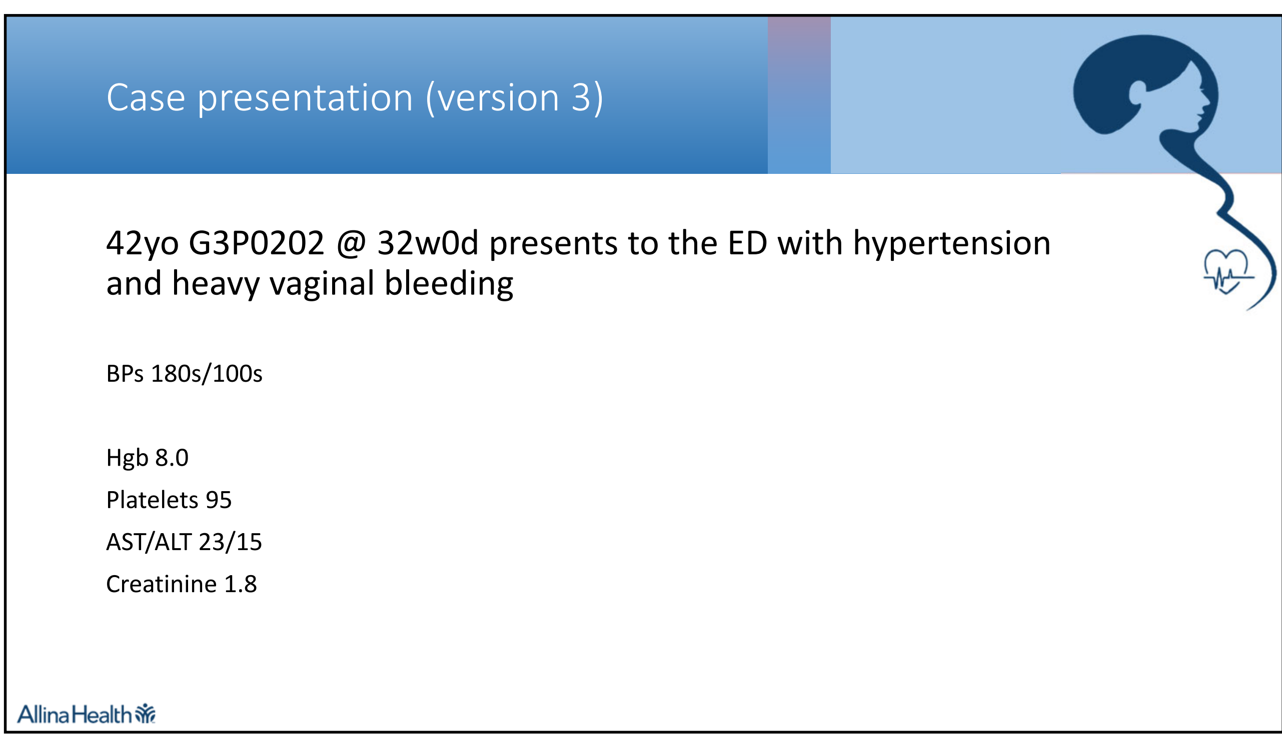

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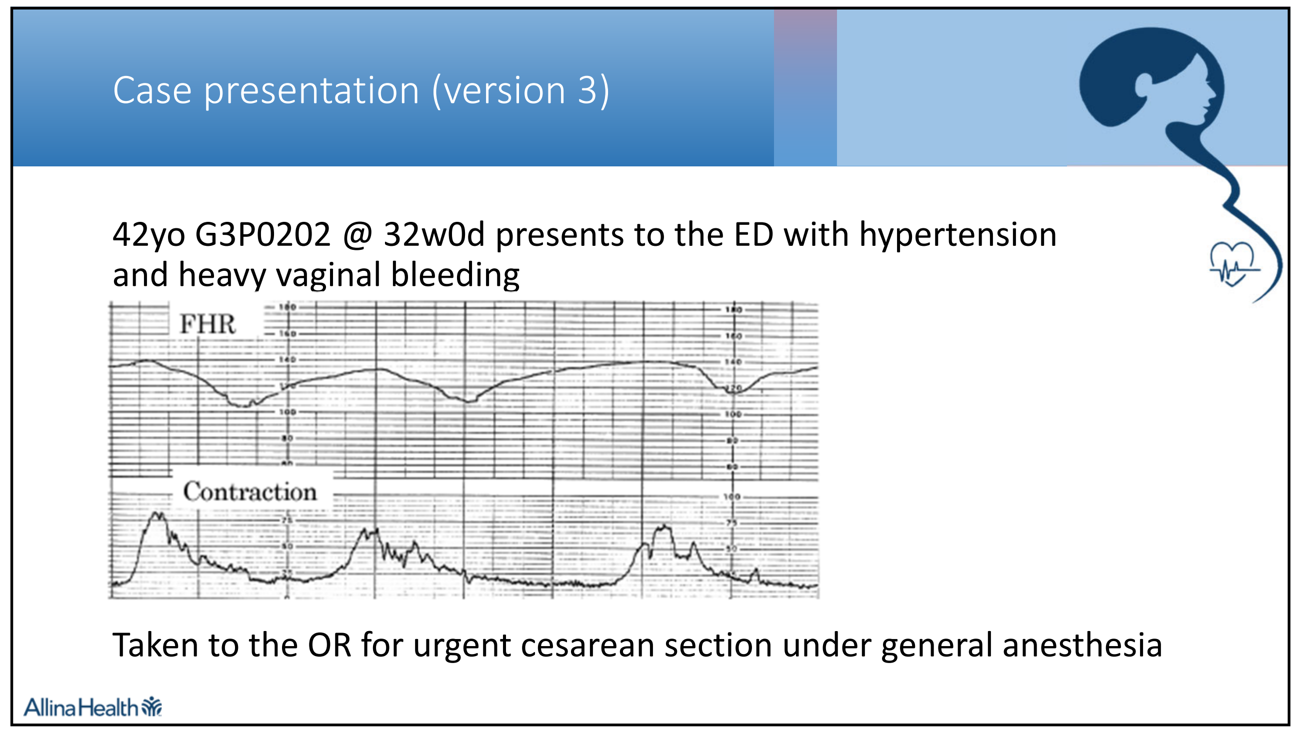

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Case presentation (version 3)

42yo G3P0202 @ 32w0d presents to the ED with hypertension and heavy vaginal bleeding

Intra-op – placental abruption found with large intrauterine clots; postpartum hemorrhage with qbl 2500 (estimated 4L total blood loss including antepartum losses)

Transfused with PRBCs/platelets/FFP/cryoprecipitate. Hypotension during the case. Minimal urine output during the case.

Fibrinogen 97, INR 1.5

Transferred to the ICU post-op

Anuric in the ICU, creatinine bumped to 2.8 then 4.5, potassium climbing, dialysis started on POD#2

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Acute Kidney Injury during pregnancy

Common causes include:

-- pre-eclampsia

-- sepsis

-- hyperemesis gravidarum

-- postpartum hemorrhage

-- thrombotic microangiopathy (TTP/HUS)

-- acute fatty liver of pregnancy

→ many cases have more than one cause

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Gonzalez Suarez et al, "Renal Disorders in Pregnancy: Core Curriculum 2019" AJKD 2019; 73(1): 119-130.

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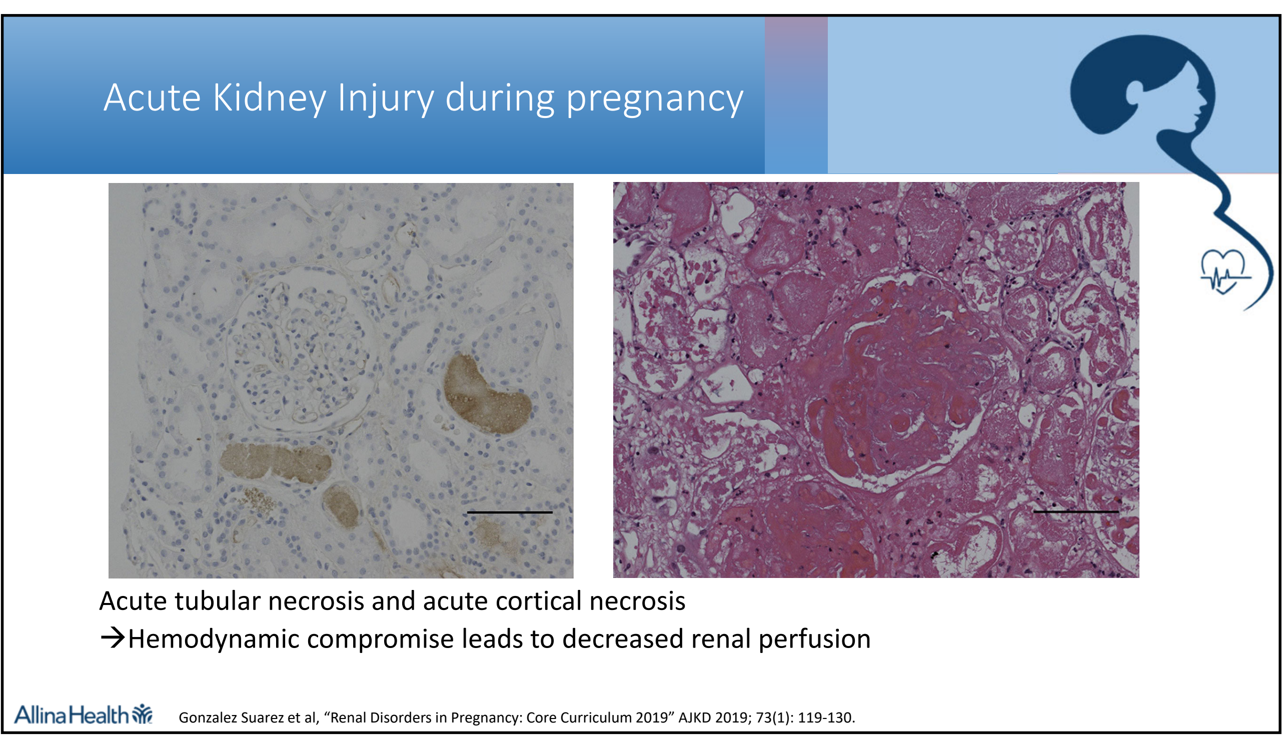

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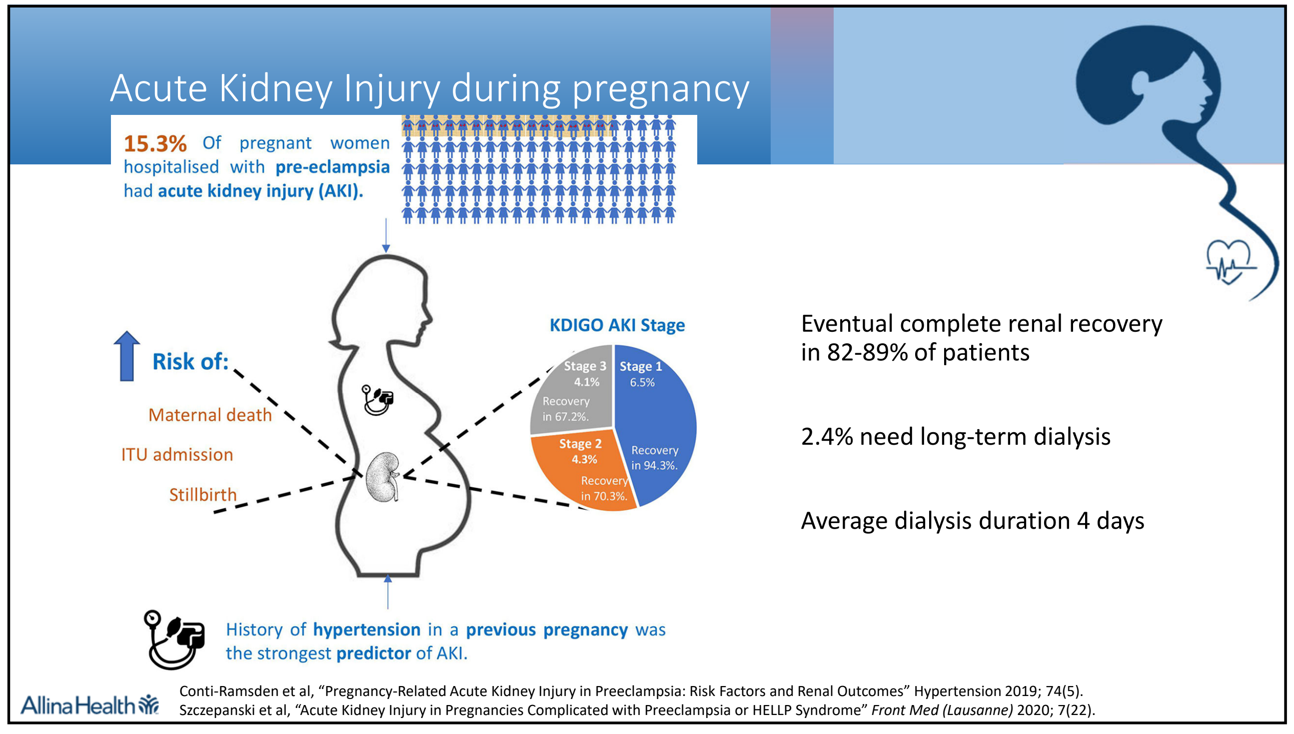

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Case presentation (version 4 and 5)

42yo G3P0202 @ 32w0d sent from routine OB visit due to elevated blood pressures and proteinuria on urine dipstick

Past medical history: ESRD s/p renal transplant 2 years ago

Past medical history: donated a kidney to her sister 2 years ago

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Pregnancy after kidney transplant

- Best outcomes in women who wait 1-2 years after transplant for pregnancy, no acute rejection prior to pregnancy, normal renal function and no hypertension
- Optimize immunosuppressive regimen prior to pregnancy
  - Usually combination of Azathioprine, Tacrolimus, Cyclosporine, Prenisone
- Follow levels and titrate immunosuppressive therapy during pregnancy
- Risk of pre-eclampsia 27%, risk of preterm delivery 45%, live birth rate 73%
- Risk of acute rejection during pregnancy not higher than outside pregnancy (1-14%)
- Risk of graft failure 5.8% at 1 year after pregnancy and 6.9% at 5 years (similar to other transplant recipients)

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Gonzalez Suarez et al, "Renal Disorders in Pregnancy: Core Curriculum 2019" *AJKD* 2019; 73(1): 119-130.
Shah and Verma, "Overview of Pregnancy in Renal Transplant Patients" *Int J Nephrol* 2016; 4539342

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Pregnancy after kidney donation

- Generally good outcomes
- Increased risk of hypertensive disorders of pregnancy (11%)
- No increased risk of preterm delivery or low birth weight

AllinaHealth Gonzalez Suarez et al, "Renal Disorders in Pregnancy: Core Curriculum 2019" *AJKD* 2019; 73(1): 119-130.

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Clinical pearls

- CONTEXT MATTERS – get the clinical history for a patient with proteinuria and hypertension in pregnancy
- Not all proteinuria and hypertension is pre-eclampsia (but most is…)
- Watch out for acute kidney injury in pregnancy

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Thank you

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