


Renal Disease in Pregnancy:
Proteinuria, Pre-eclampsia,
Transplants and More

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Disclosures

None



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Objectives



- To recognize pre-eclampsia and other causes of proteinuria and hypertension in pregnancy
- To recognize acute kidney injury in pregnancy
- To identify patients at high risk for renal complications in pregnancy
- To understand obstetric risks in pregnant patients with renal disease

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Case presentation (version 1)



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

BPs 140s/90s

Urine protein:creatinine ratio 1.5

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AST/ALT 23/15

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PMH: type 2 diabetes x10 years controlled on insulin
chronic kidney disease stage 2







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Chronic Kidney Disease in Pregnancy



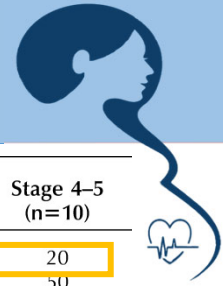
CKD impacts 14% of women globally, 1-4% of women during pregnancy

Stage of CKD	STAGE 1	STAGE 2	STAGE 3A	STAGE 3B	STAGE 4	STAGE 5
eGFR	90 or greater	Between 60 and 89	Between 45 and 59	Between 30 and 44	Between 15 and 29	Less than 15
Level of kidney damage	 Mild kidney damage	 Mild kidney damage	 Mild to moderate kidney damage	 Mild to moderate kidney damage	 Moderate to severe kidney damage	 End-stage kidney disease. Kidneys are close to failure or have completely failed. You will need to start dialysis or have a kidney transplant.

Allina Health  Hui D and Hladunewich M, "Chronic Kidney Disease and Pregnancy" *Obstet Gynecol* 2019; 133(6): 1182-94.

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Impact of Pregnancy on Chronic Kidney Disease



Outcome	Control Group (n=836)	Stage 1 (n=370)	Stage 2 (n=87)	Stage 3 (n=37)	Stage 4-5 (n=10)
Progressed to next stage of CKD	NA	7.6	12.6	16.2	20
New-onset HTN	5.5	7.9	17.6	47.1	50
New-onset or doubling of proteinuria	NA	20.5	37.9	86.5	70
Gestational age at delivery (wk)	39.0±1.7	37.6±2.6	35.7±3.2	34.4±2.4	32.6±4.2
Delivery at less than 37 wk of gestation	6.1	23.5	50.6	78.4	88.9
Delivery at less than 34 wk of gestation	1.0	7.3	20.7	37.8	44.4
Birth weight (g)	3,242±480	2,966±659	2,484±707	2,226±582	1,639±870
SGA less than 10%	10.3	13.3	17.9	18.9	50
NICU	1.8	10.3	27.6	44.4	70

CKD, chronic kidney disease; NA, not applicable; HTN, hypertension; SGA, small for gestational age; NICU, neonatal intensive care unit. Data are % or mean±SD.

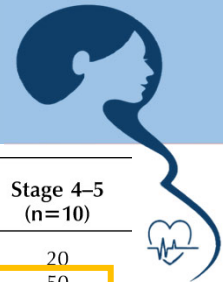
Data from Piccoli GB, Cabiddu G2, Attini R3, Vigotti FN4, Maxia S2, Lepori N, et al. Risk of adverse pregnancy outcomes in women with CKD. *J Am Soc Nephrol* 2015;26:2011-22.

OBSTETRICS & GYNECOLOGY

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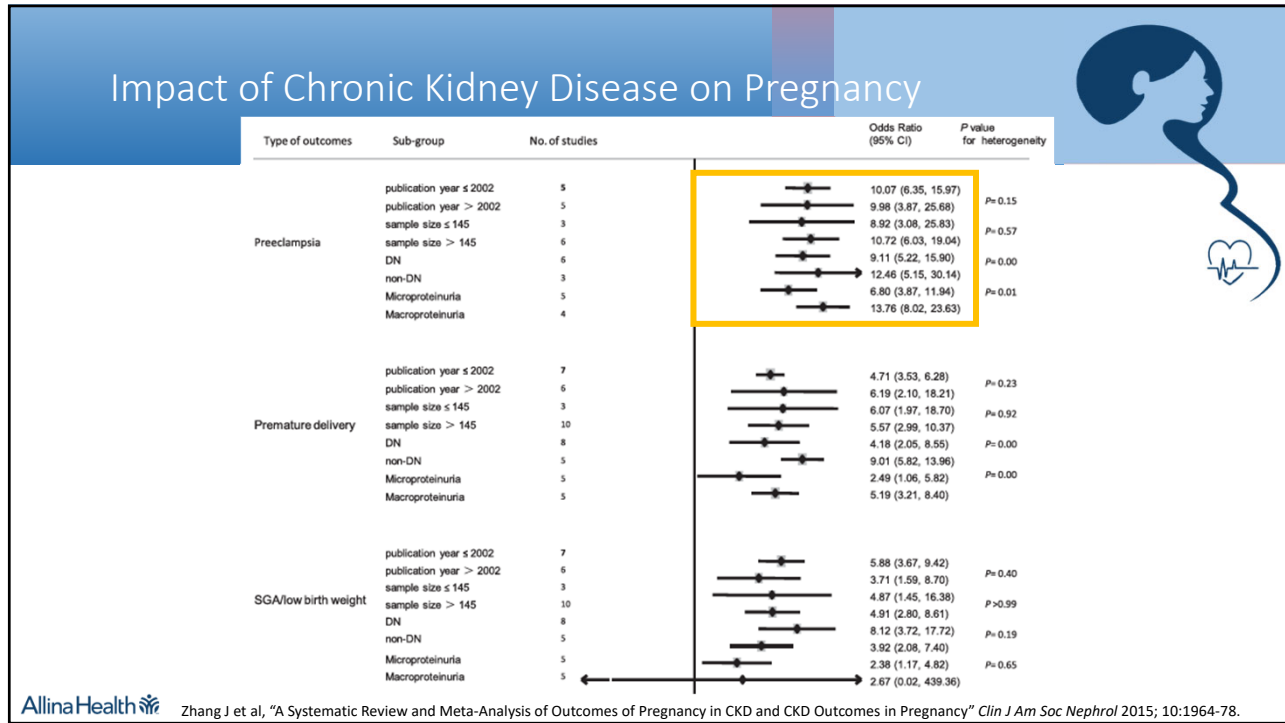
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Pregnancy impact on proteinuria

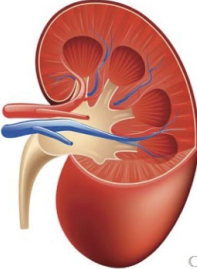
Normal urine protein first trimester: 60-90mg/day
third trimester 180-250mg/day

Anatomical changes

- Dilatation of the collecting system (ureters, renal pelvis, and calyces) right>left
- Increase in renal size and volume

Clinical Implications

- Difficult to diagnose true obstruction
- Increased rates of pyelonephritis from asymptomatic bacteriuria



Physiological changes

- Systematic and renal vasodilatation
- Increased renal plasma flow
- Increased glomerular filtration rate
- Altered tubular reabsorption of glucose, amino acids, uric acid, and proteinuria

Clinical Implications

- Decreased blood pressure potentially allowing for less medication
- Decreased serum creatinine
- Mildly increased urine protein

Patients with baseline proteinuria may have steady increase in proteinuria throughout pregnancy

AllinaHealth Hui D and Hladunewich M, "Chronic Kidney Disease and Pregnancy" *Obstet Gynecol* 2019; 133(6): 1182-94.
Gonzalez Suarez et al, "Renal Disorders in Pregnancy: Core Curriculum 2019" *AJKD* 2019; 73(1): 119-130.

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Pre-eclampsia diagnosis in patients with baseline proteinuria



Clinical context is key!

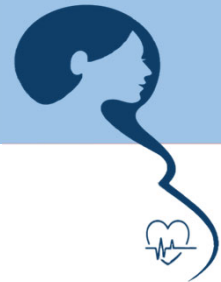
- Mild gradual increase in urine protein may be normal, sudden or significant increase is not
- Worsening proteinuria with new/worsening hypertension is pre-eclampsia unless proven otherwise
- Look at underlying etiology for renal disease (i.e. could this be a disease flare???)



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Chart review:

No history of hypertension

P:C ratio prior to pregnancy: 0.4

P:C ratio first trimester: 0.3

→ Yes, this is pre-eclampsia



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Case presentation (version 2)



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

BPs 140s/90s

Urine protein:creatinine ratio 1.5

Hgb 10.5

Platelets 97

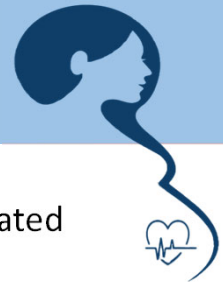
AST/ALT 23/15

Creatinine 0.9

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Case presentation (version 2)



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

Past Medical History: Lupus diagnosed 3 years ago

Baseline creatinine 0.8, P:C 0.2 prior to pregnancy

During a lupus flare last year, creatinine 1.5 and 24h urine protein 750mg

On hydroxychloroquine and azathioprine prior to pregnancy, stopped with pregnancy and didn't restart despite counseling because she was worried about the effect on her baby

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