GlomCon
Latinoamérica

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1970
SOCIEDAD LATINOAMERICANA DE NEFROLOGÍA E HIPERTENSIÓN

SÍNDROME NEFROTICO DESPUÉS DE APLICACIÓN DE VACUNA CONTRA COVID-19

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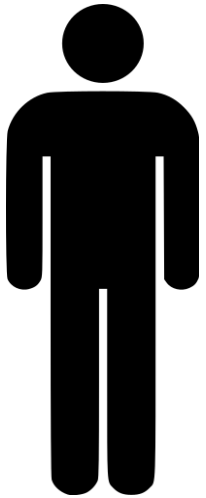
Identificación

Masculino
69 años
Médico
Originario y Residente de Metepec, Estado México
Católico



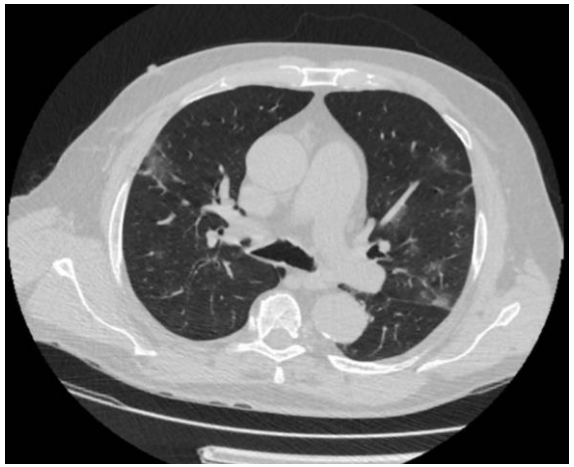
Antecedentes heredo familiares:

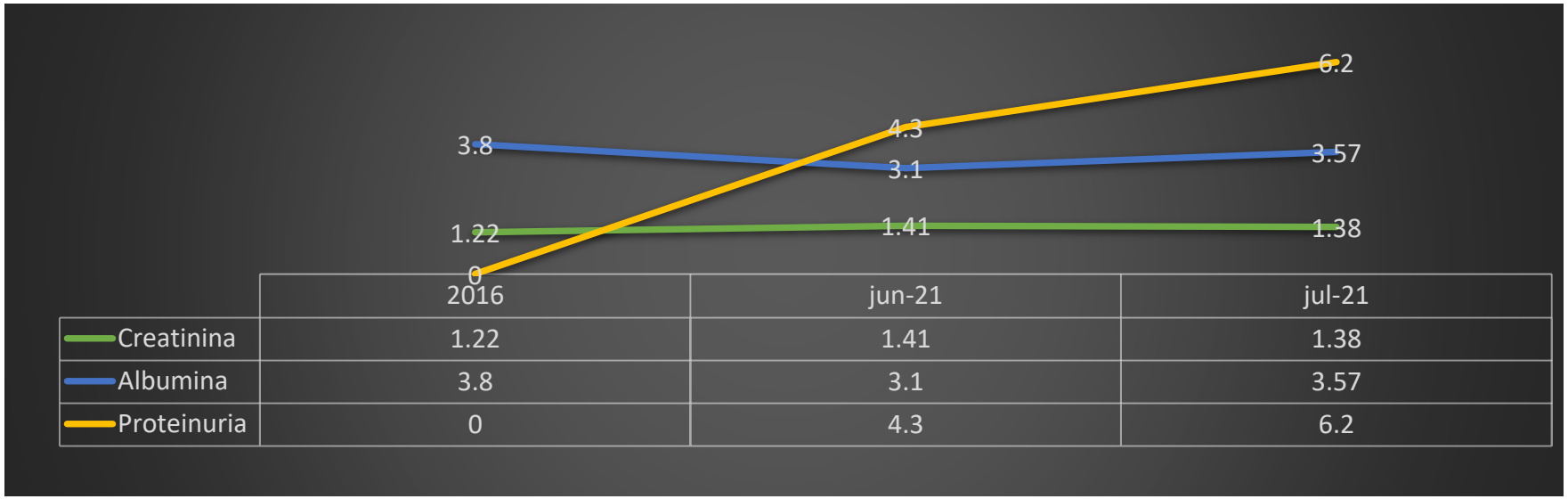
- Tío con Cancer renal, desconoce estirpe histológica.
- Abuela con diabetes mellitus tipo 2

Antecedentes Patológicos

- Diabetes mellitus tipo 2 diagnosticado hace 7 años en tratamiento con Metformina cada 24 horas
- Hipertensión arterial sistémica diagnosticado hace 6 años en tratamiento. Con losartan cada 24 horas
- Enfermedad por SARS-CoV-2 en diciembre 2020
  - Neumonía atípica diagnosticada el 11/12/2020, sin requerimiento de Oxígeno suplementario, tratamiento domiciliario
  - Actualmente en rehabilitación pulmonar
- Fibrilación auricular permanente diagnosticado en junio 2021, se inició tratamiento con apixaban cada 24 horas
- Alergias / transfusiones : no refiere.
- Quirúrgicos: osteosíntesis fractura de tobillo derecho en 2013

- **ENFERMEDAD ACTUAL:** Inicia en junio 2021, con edema de extremidades inferiores, astenia adinamia, de forma inicial relacionada a secuelas por neumonía por SARS COV2, sin embargo durante su revisión de seguimiento post-Covid se detecta aparición de Proteinuria en Examen general de orina, motivo por el que es enviado a consulta de Nefrología





	2016	jun-21	jul-21
Creatinina	1.22	1.41	1.38
Albumina	3.8	3.1	3.57
Proteinuria	0	4.3	6.2

Diciembre 2020: Neumonia por SARS COV2

Enero 2021: Inicia rehabilitación pulmonar con seguimiento en consulta de Neumología.

18 de Marzo 2021 y 16 de Abril 2021: Vacunación SINOVAC

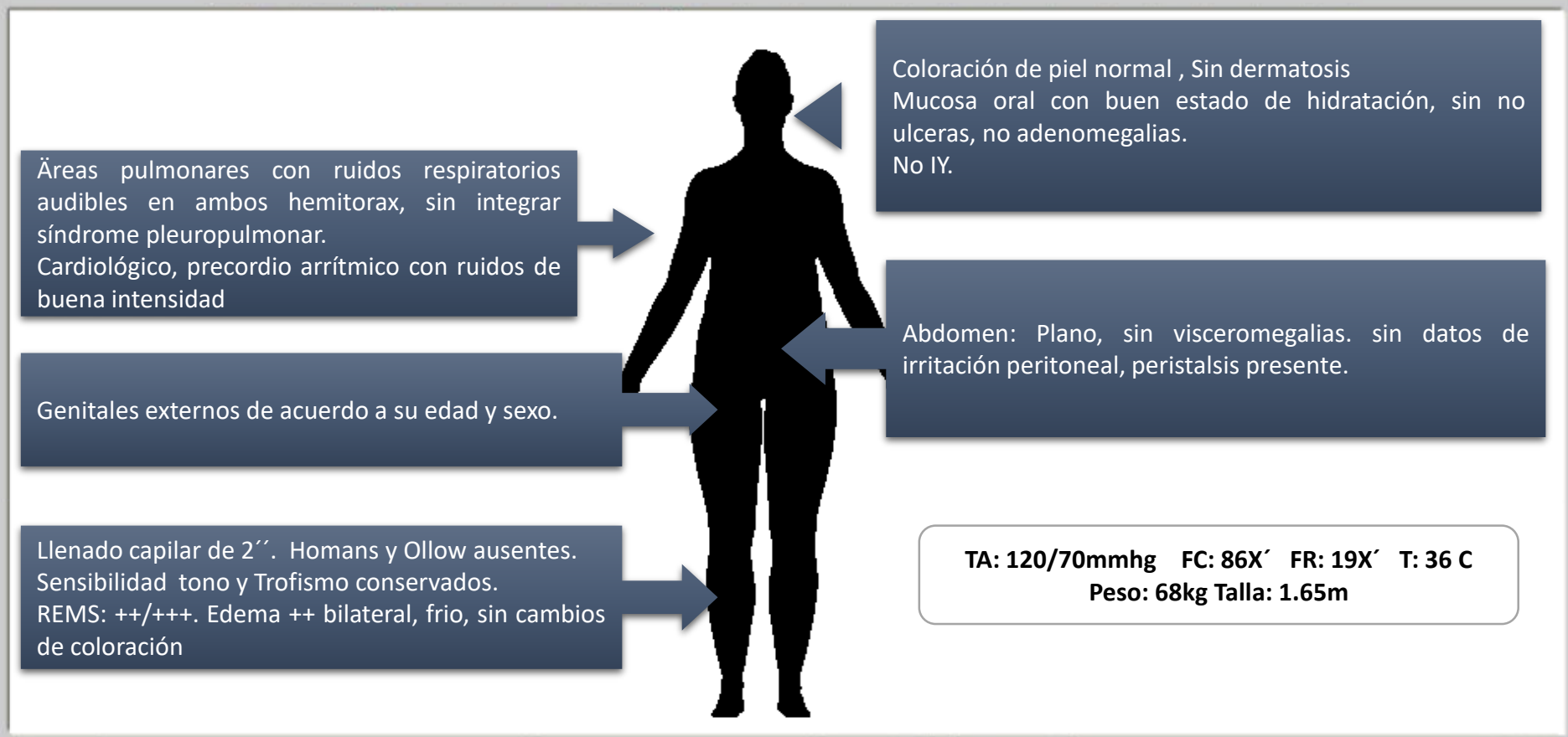
Junio 2021: Aparición de edema + proteinuria. Se envía a Nefrología

Se aumenta Bloqueo del RAAS

Julio 2021: Hospitalización

Síndrome Nefrótico

Exploración Física



Idx: Síndrome Nefrótico en Estudio

15 Junio 2021

Sx Nefrótico

Ego: densidad 1.025, ph 6.5, nitritos negativo, **proteinas 4302, eritros 63, leucos 0-2**

Proteinuria en 24 horas: 5.67g / Albuminuria en 24 horas: 5.1g/dl

Glu 78, cre 1.4, Ac urico 9.05, col 213, alb 3.1

Sedimento Urinario

6 Julio: consulta de Nefrología e ingreso

Anticuerpos antinucleares / anti DNA: NEGATIVO

Complemento c4 0.19 g/L (0.10-4.0) c3: 1.01 g/L (0.9-1.8)

Panel viral hepatitis B, C y VIH: negativo

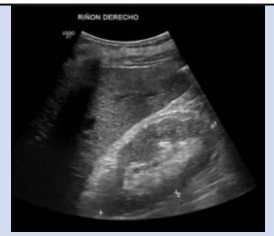
Urocultivo negativo

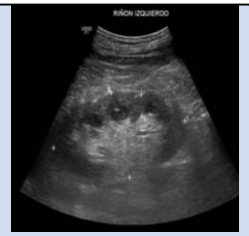
Marcadores tumorales: alfafetoproteína, ag carcinoembrionario, ca 19-9, negativo

Internamiento Julio 2021

ULTRASONIDO RENAL

RD: 114X69X58
RI: 118X 55X52



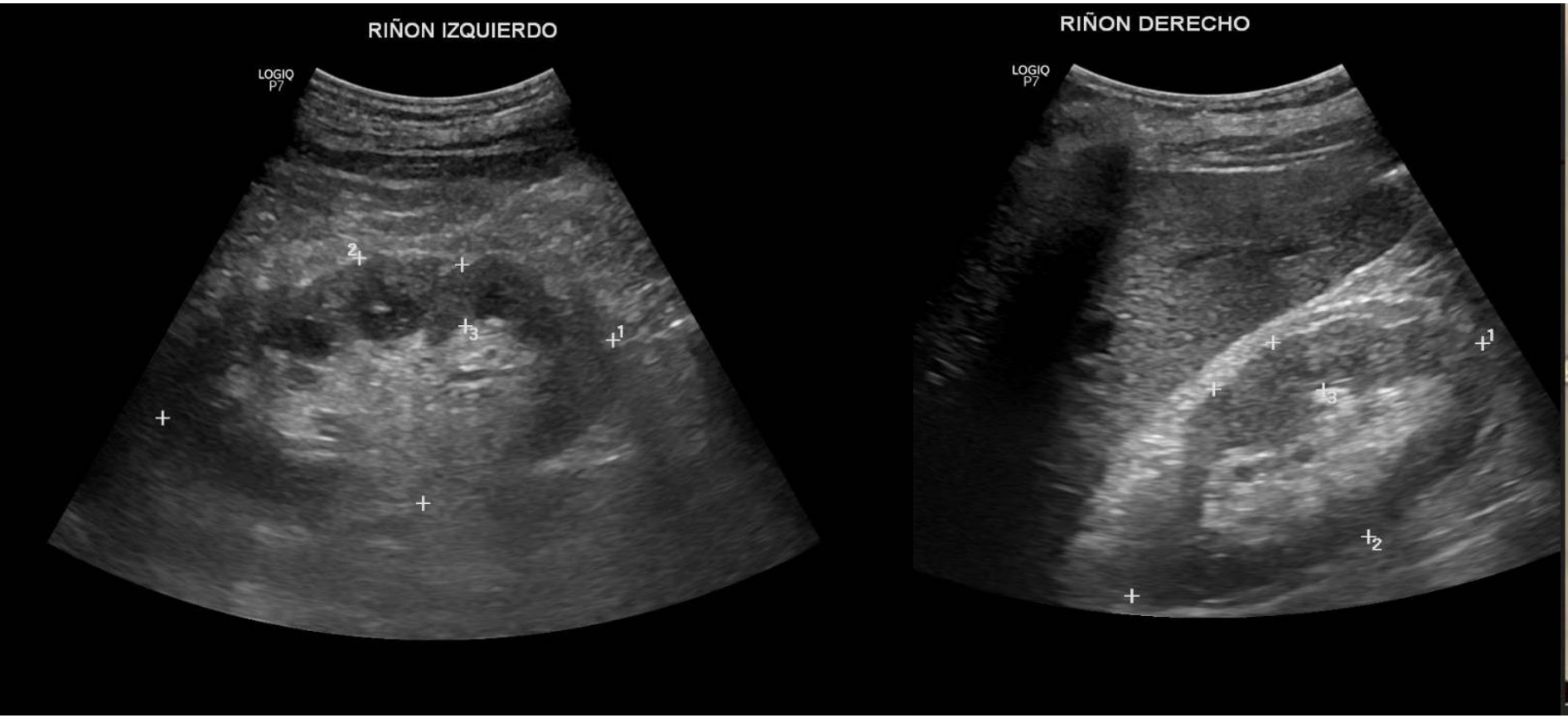


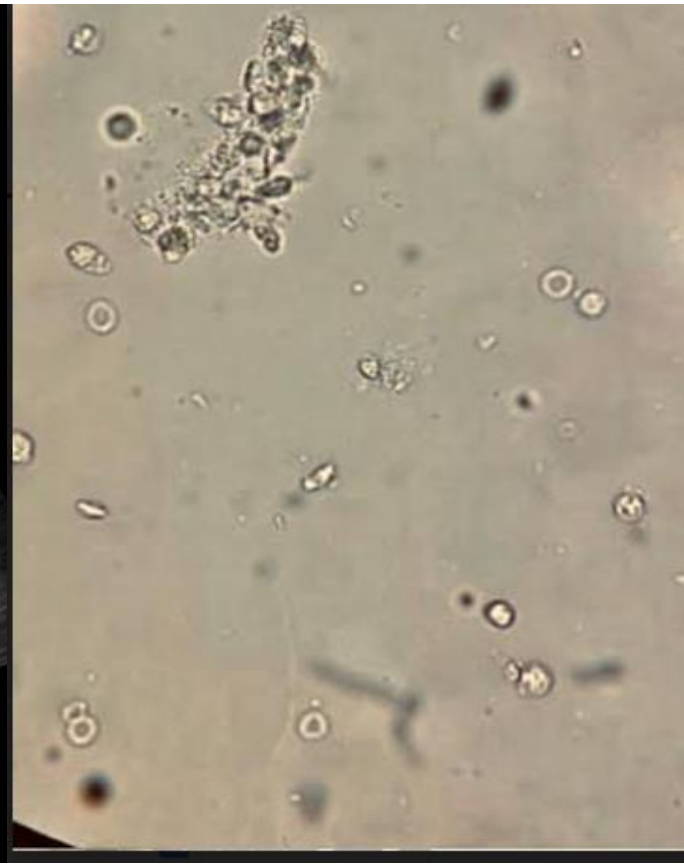
Anticuerpos Anti PLA2r: NO CONTAMOS CON ESTUDIO

ECOTT: Cardiopatía hipertensiva, Dilatación de aurícula izquierda.

FEVI 57%, PSAP 47mmhg

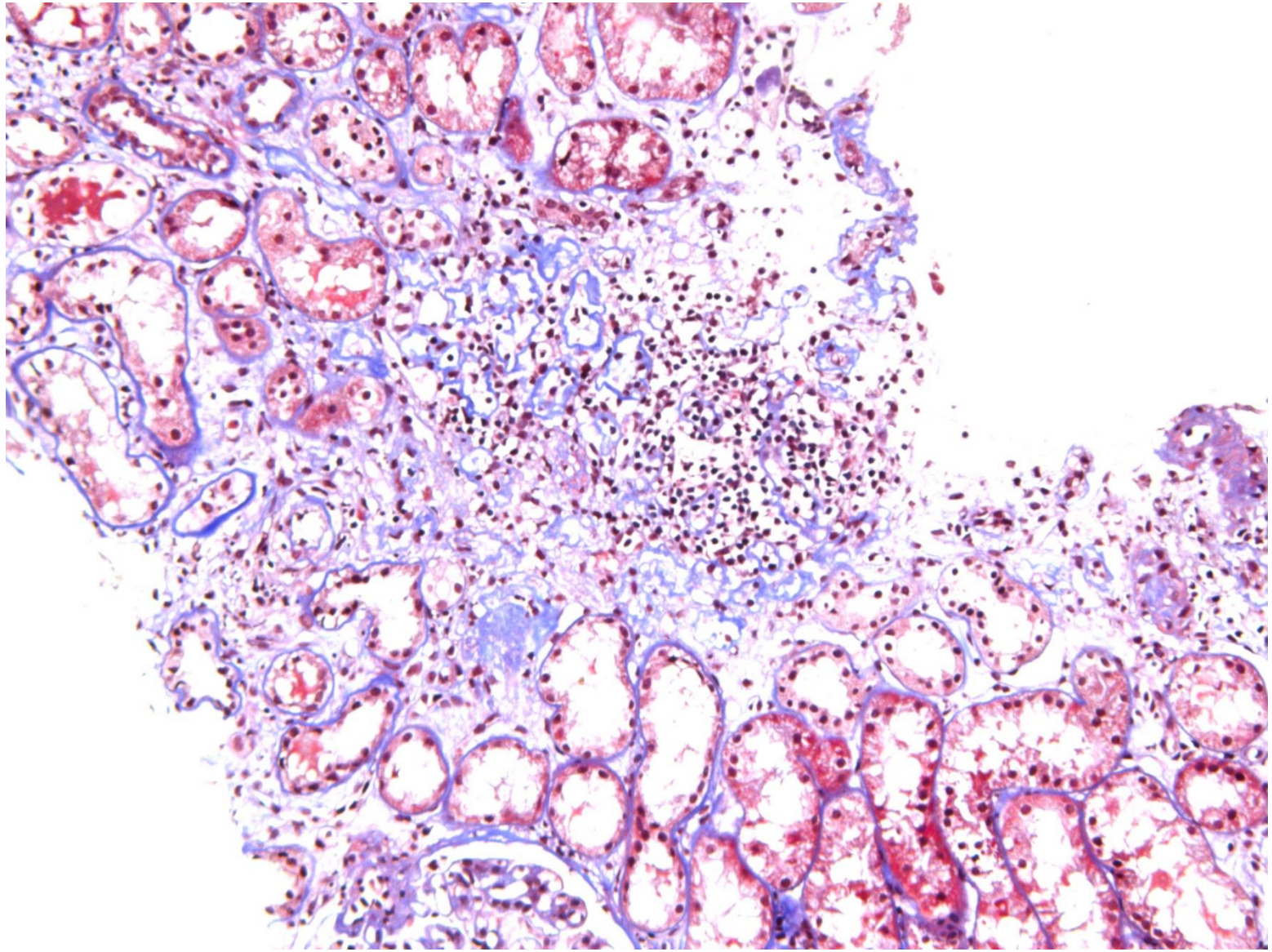
Ultrasonido / Sedimento

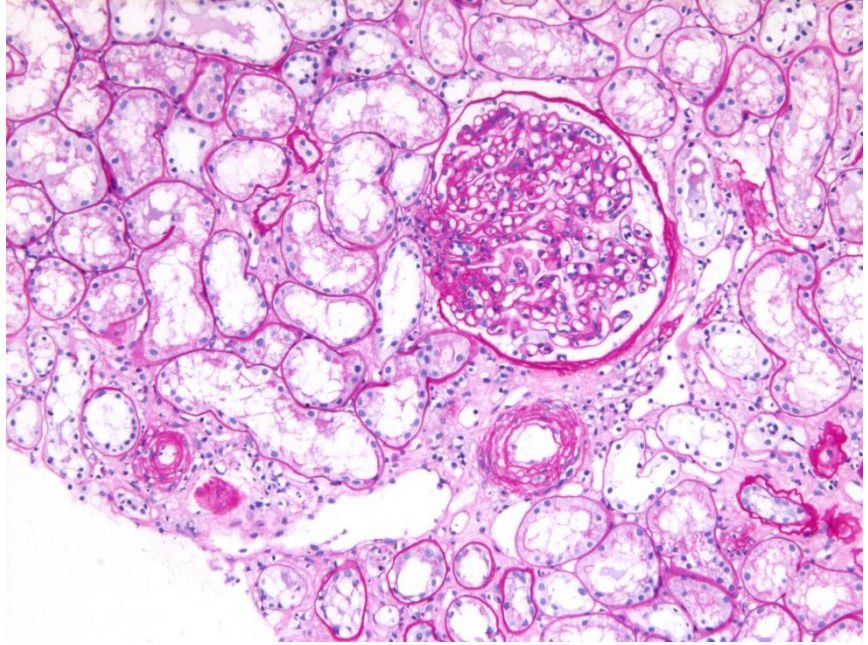


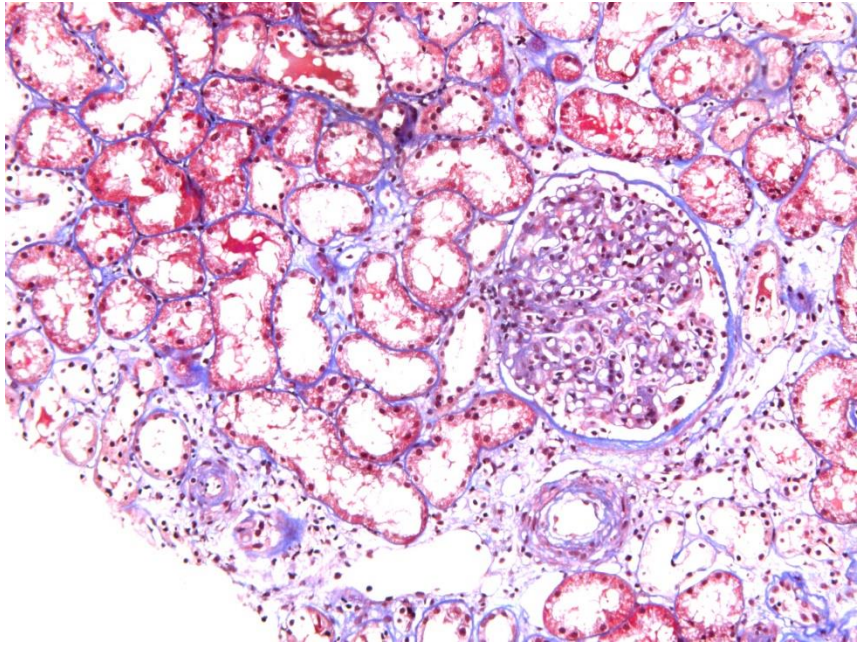


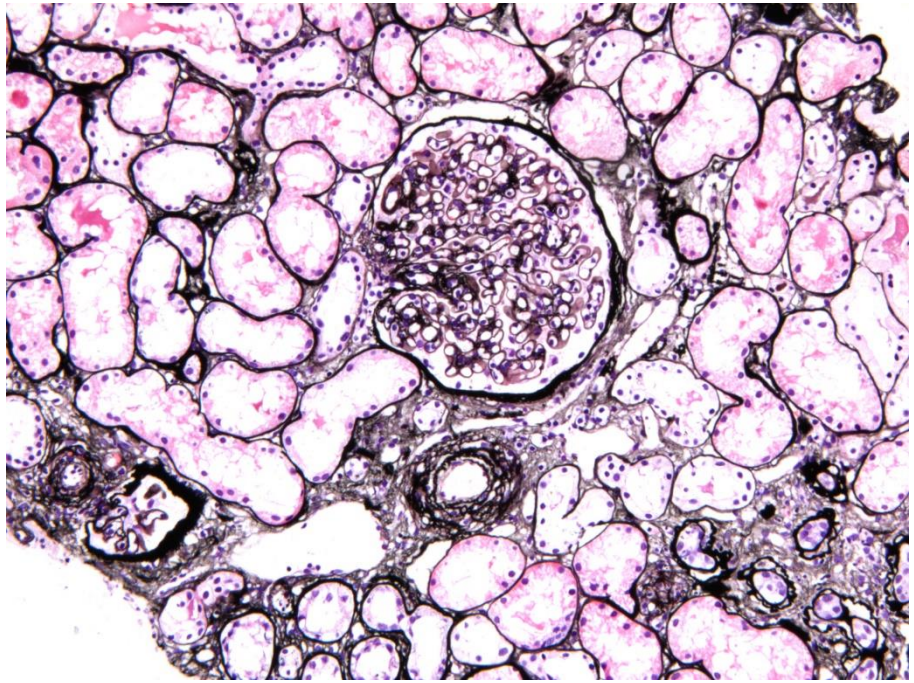
Biopsia Renal

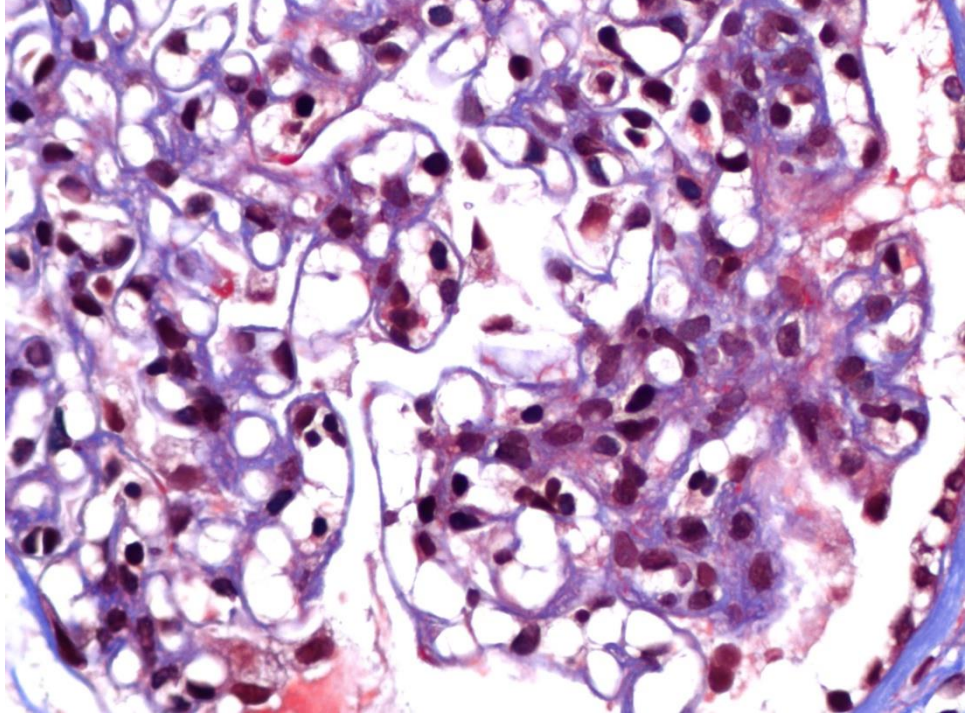
Dra. Yolotzin Valdespino
Dra. Isabel Mora Mendoza

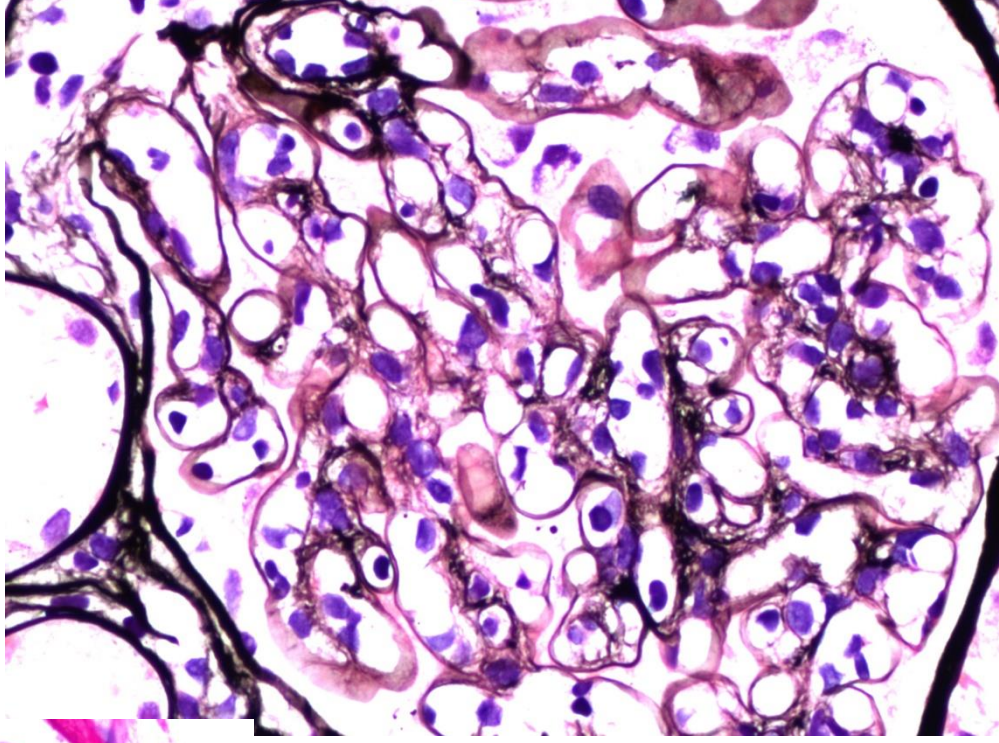


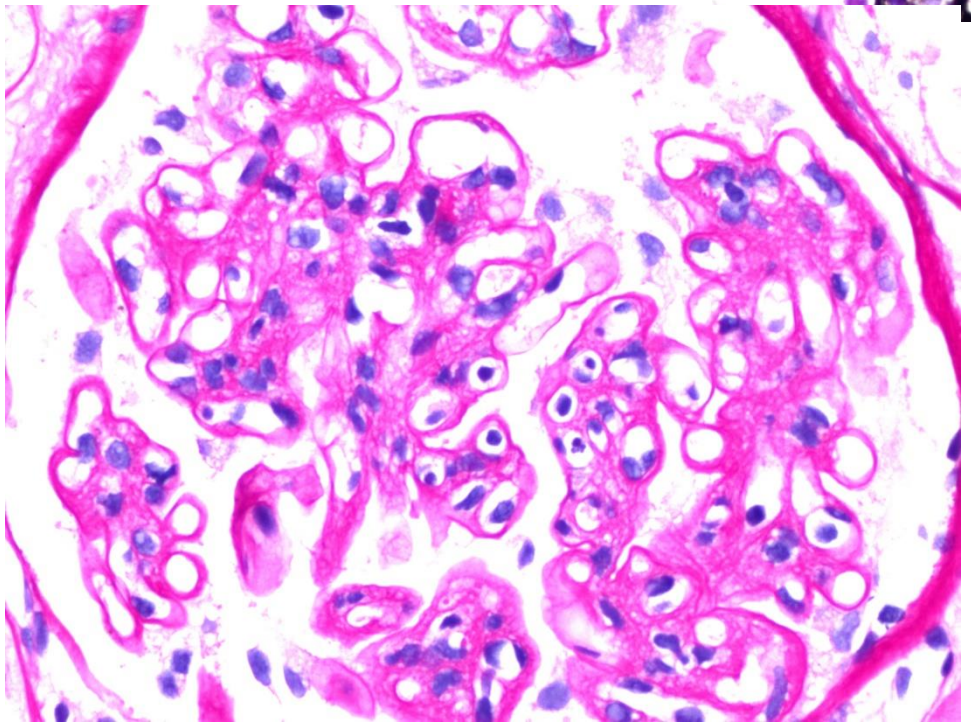


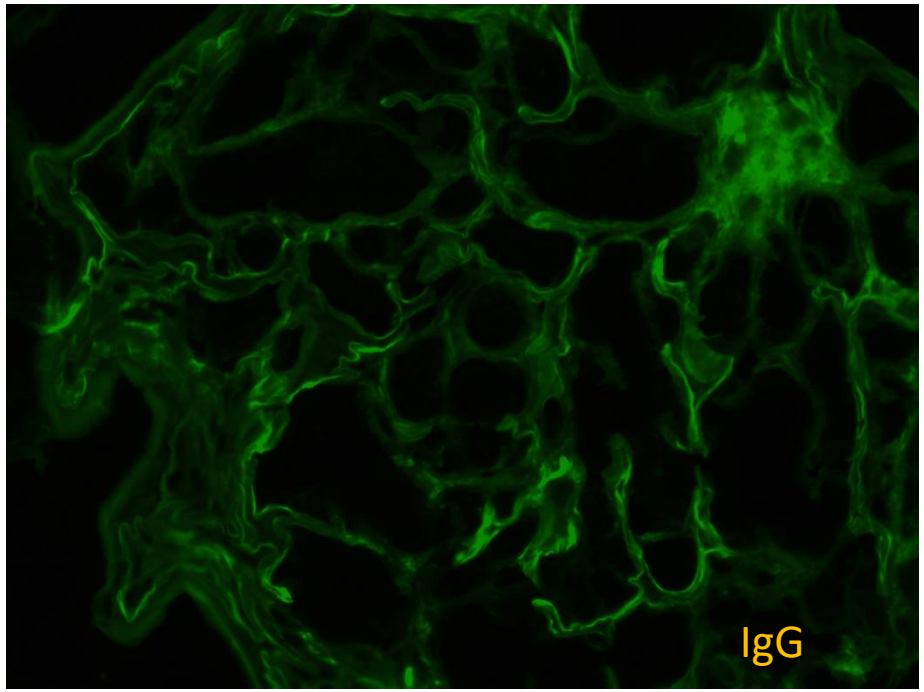


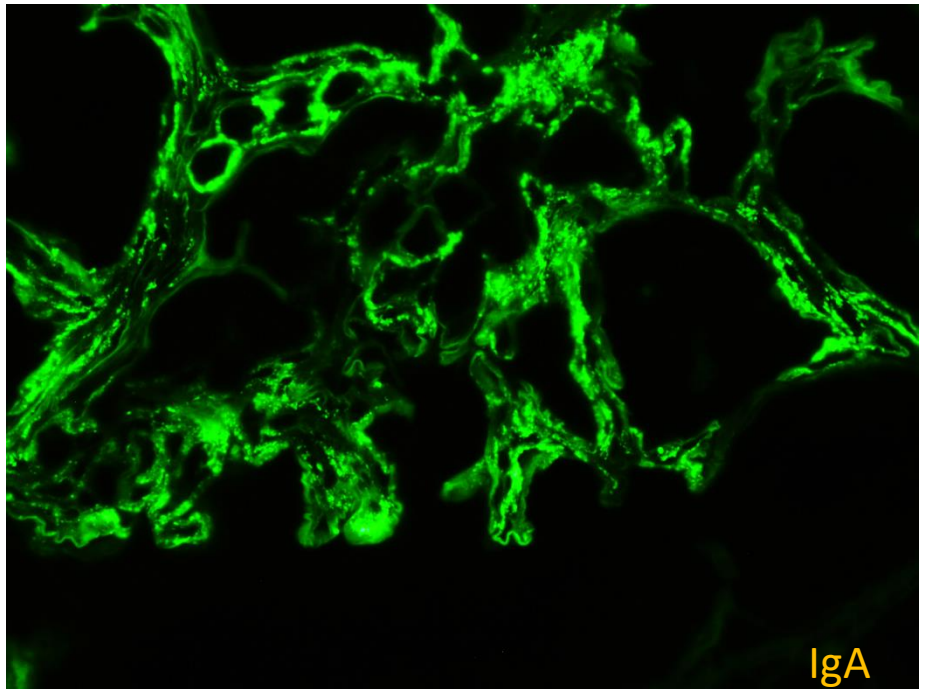


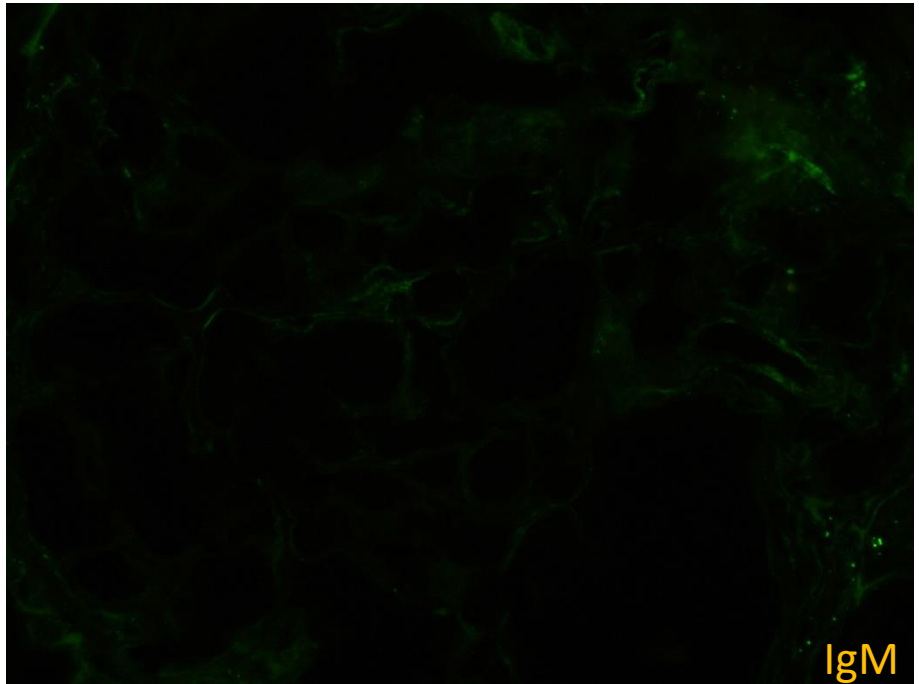


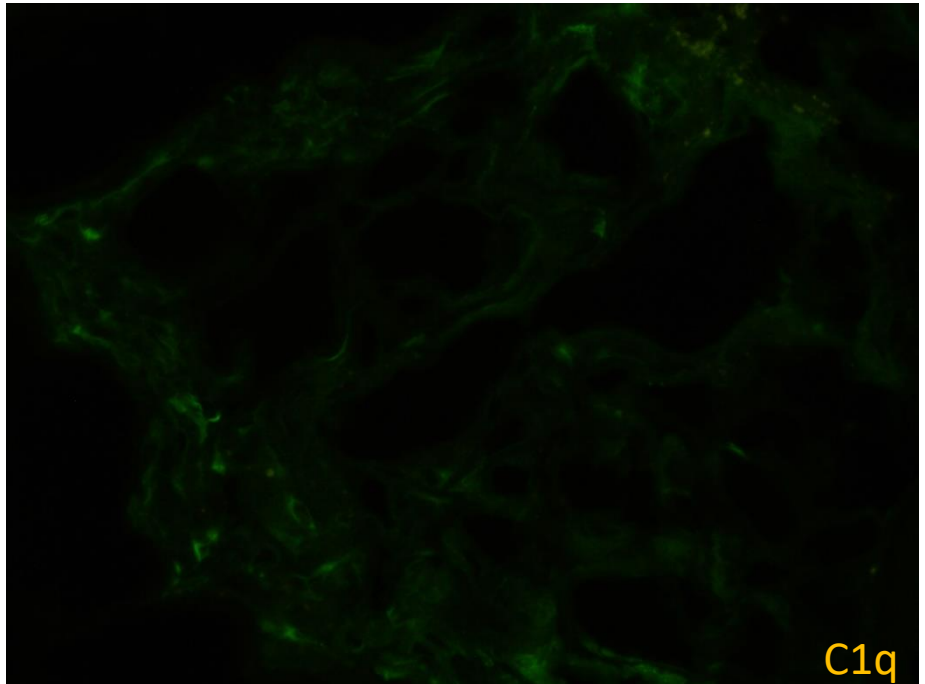


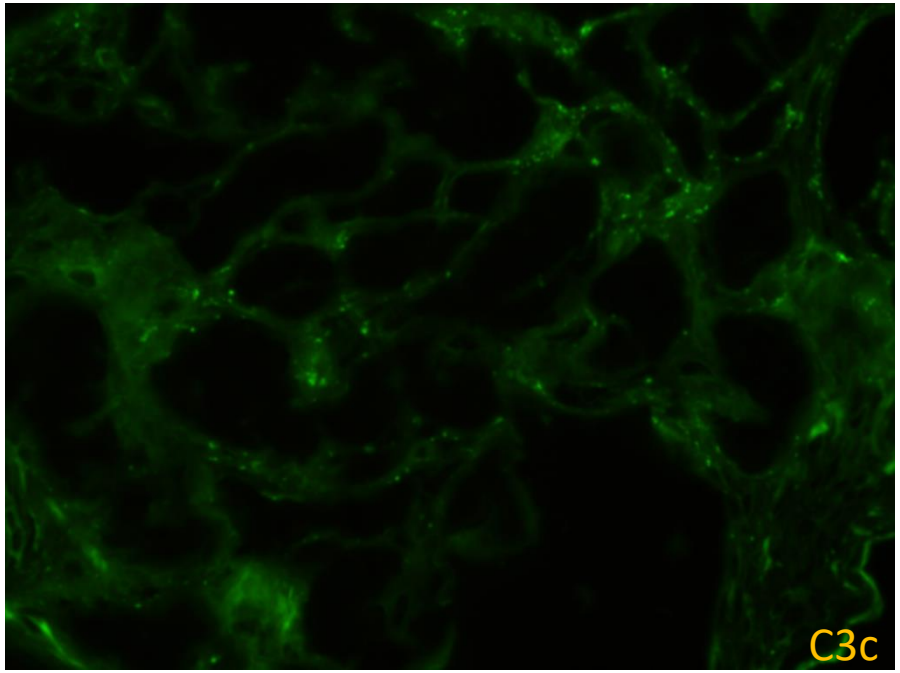


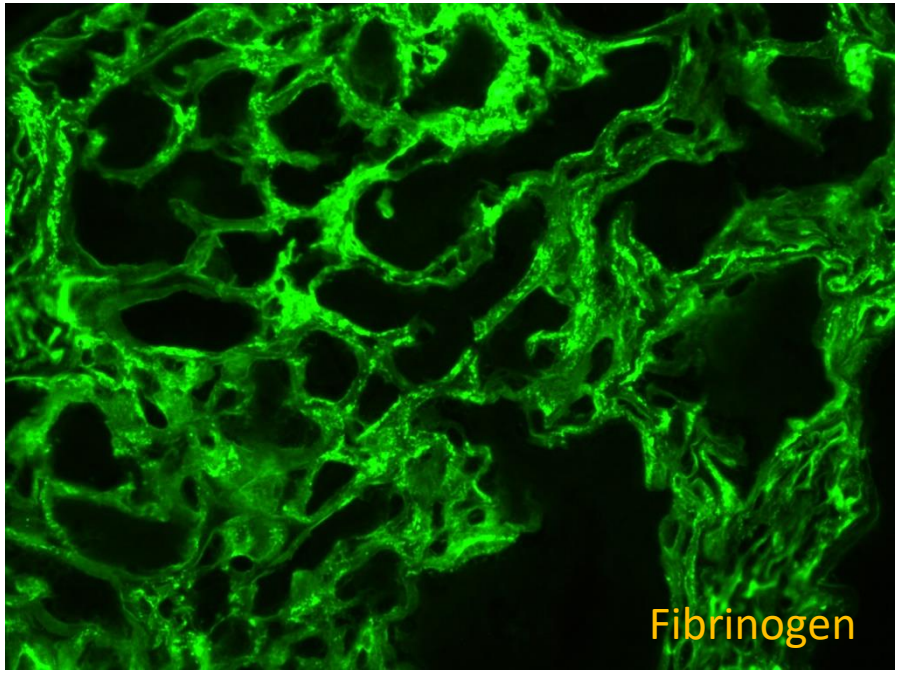

IgG

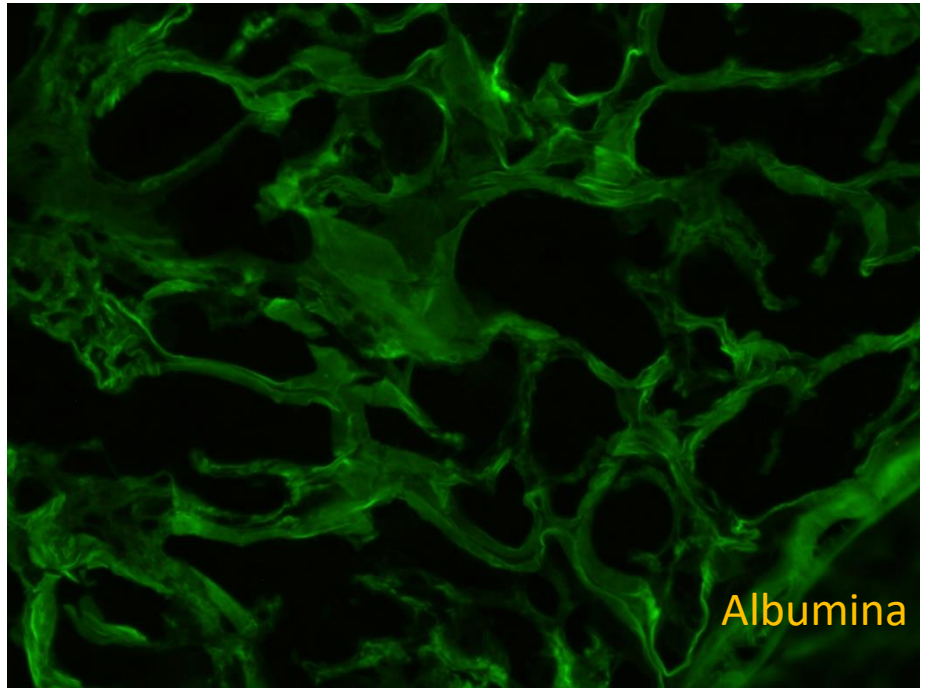

IgA

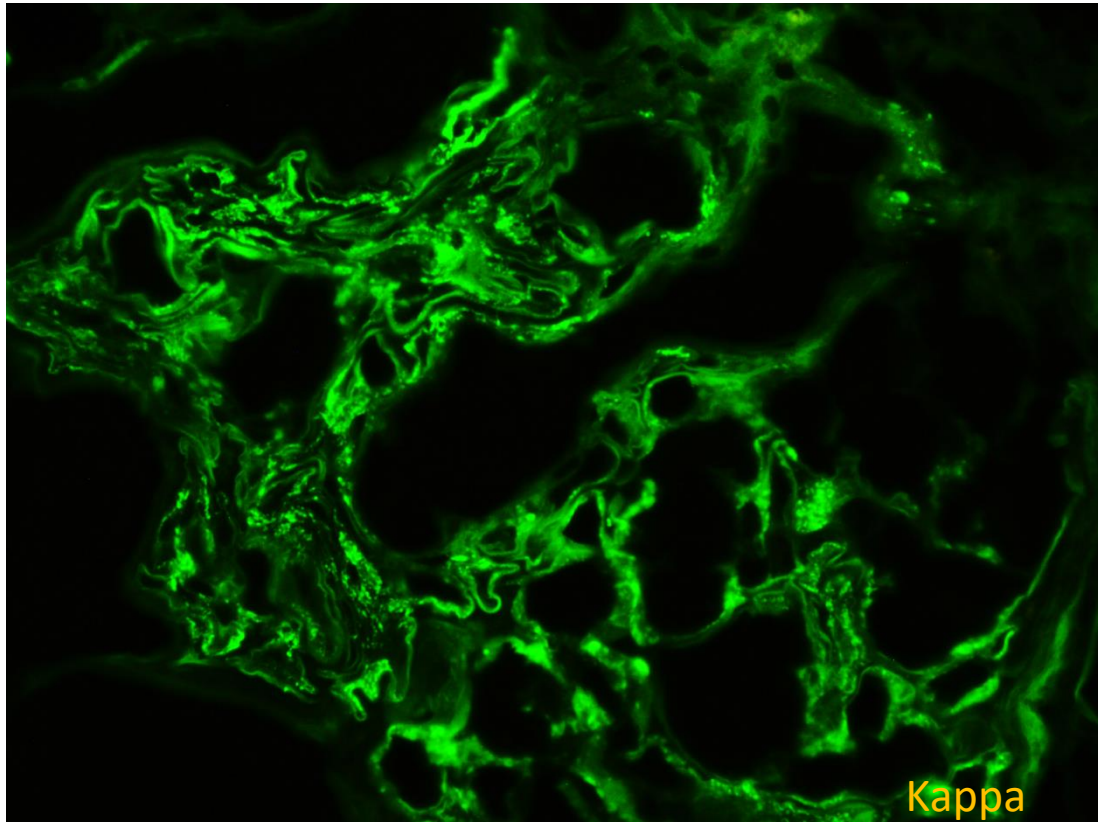

IgM

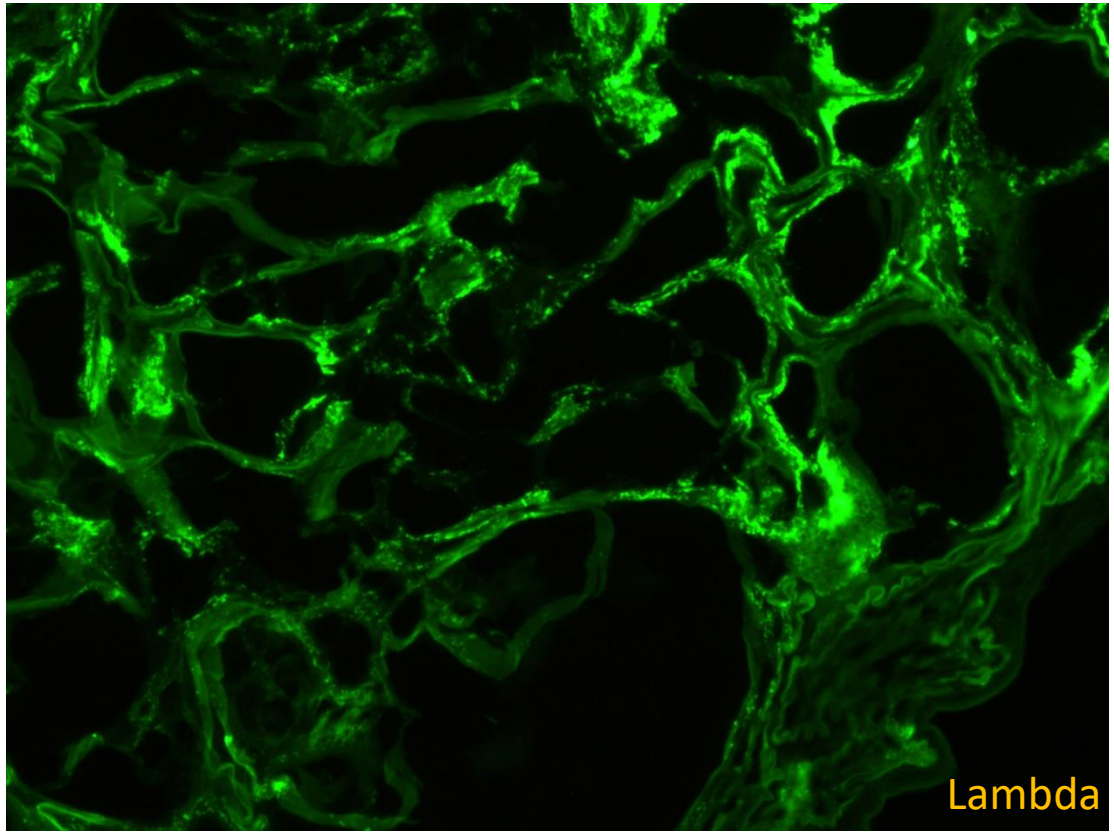

C1q


C3c


Fibrinogen
o


Albumina

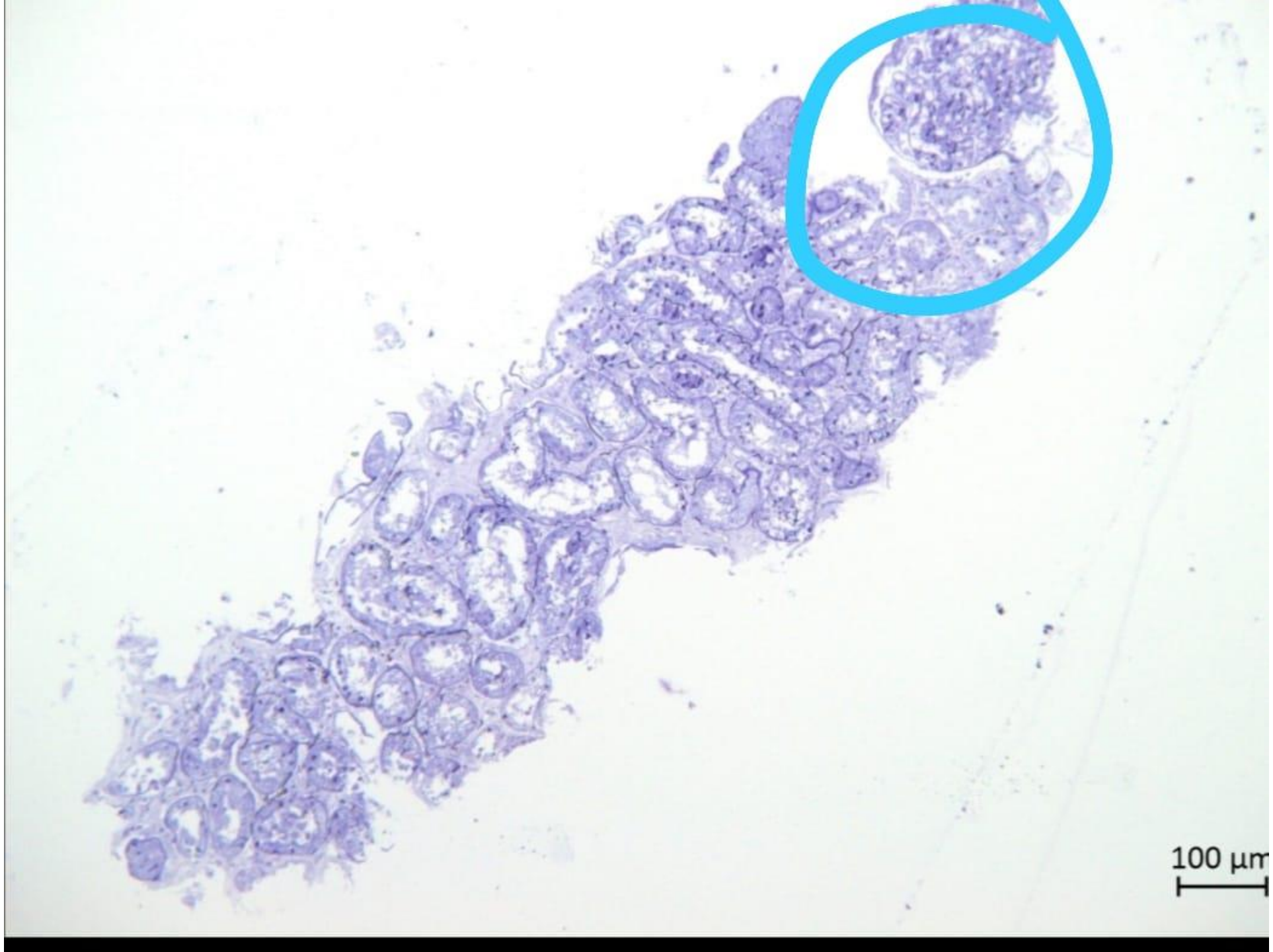

Kappa


Lambda

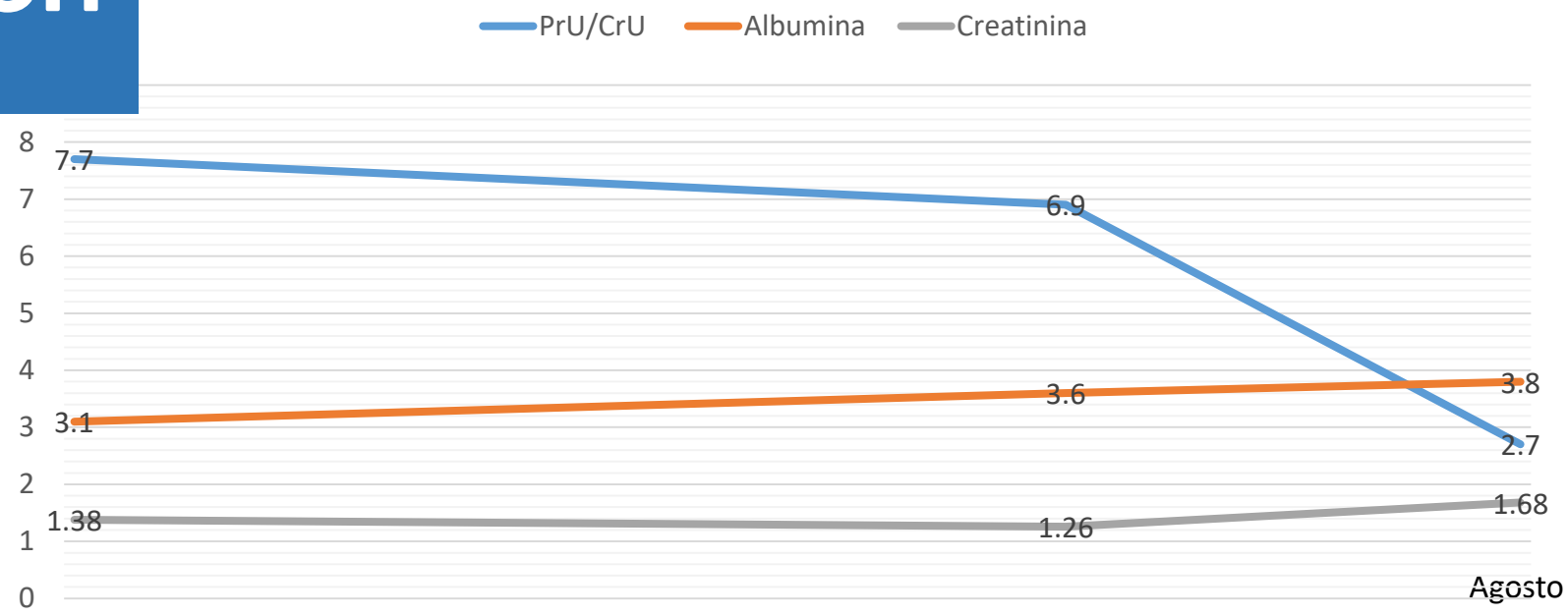
Diagnóstico:

-Nefropatía por IgA con hipertrofia podocitaria (M 1, E1, S0, T0, EX0).

-Fibrosis intersticial grado I


100 µm

Evolución



Julio 21: Diagnostico IgAN

Inicio de Tratamiento julio2021

- PDN 1mg/kg/día
- Losartan
- Atorvastatina
- Tamsulosina
- Espironolactona

Agosto 2021

- PDN 60mg
- Furosemide 20mg cada 12 h
- Losartan 50mg cada 12h
- Espironolacona 50mg cada 24 h
- Apixaban 5mg cada 12h (FA)

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KI REPORTS
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CLINICAL RESEARCH

Review of Early Immune Response to SARS-CoV-2 Vaccination Among Patients With CKD

Edward J. Carr[1,*], Andreas Kronbichler[2,*], Matthew Graham-Brown[3], Graham Abra[4,5], Christos Argyropoulos[6], Lorraine Harper[7], Edgar V. Lerma[8], Rita S. Suri[9], Joel Topf[10], Michelle Willicombe[11] and Swapnil Hiremath[12]

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Carr EJ, Kronbichler A, Graham-Brown M, et al. Systematic Review of Early Immune Response to SARS-CoV-2 Vaccination Among Patients with Chronic Kidney Disease [published online ahead of print, **2021 Jul 6**]. *Kidney Int Rep*. 2021;10.1016/j.ekir.2021.06.027. doi:10.1016/j.ekir.2021.06.027

Table 1. Summary of COVID-19 vaccine platforms and status

Platform	Target	Examples	Status	Trials in dialysis or transplant?
mRNA	S protein	BNTb162b2 (Tozinameran/Comirnaty, Pfizer/BioNTech), mRNA-1273 (Moderna), CVnCoV (Curevac) PTX-COVID19-B (Providence)	BNT1262b and mRNA-1273 approved in many jurisdictions; others under development	No
Adenovirus vector	S protein	AZD1222 (Vaxzevria/CoviShield, AstraZeneca/Oxford), Ad26.COV2.S (Janssen), Sputnik V (Gamaleya), Convidecia (CanSino)	Approved in many jurisdictions	No
Inactivated protein subunit	S protein	NVX-CoV2372 (Novavax), Epivac Corona (Vector Institute), GSK/Sanofi candidate vaccine	Approved in some countries	No
Inactivated virion	Whole virus	CoronaVac (Sinovac), Covaxin (Bharat Biotech), CoviVac (Chumakov Centre, Russia)	Approved in some countries	No
Others	Whole virus, S protein	DNA vaccines, live attenuated virion, other viral vectors	Under development	No

Carr EJ, Kronbichler A, Graham-Brown M, et al. Systematic Review of Early Immune Response to SARS-CoV-2 Vaccination Among Patients with Chronic Kidney Disease [published online ahead of print, 2021 Jul 6]. *Kidney Int Rep*. 2021;10.1016/j.ekir.2021.06.027. doi:10.1016/j.ekir.2021.06.027

Table 4. A summary of glomerulonephritis cases and relapses after vaccination

Study	Vaccine	Timing	GN type	Clinical course
Minimal change disease				
Maas *et al.*	BNT162b2	7 days, first dose	New diagnosis, MCD	Steroid responsive
Lebedev *et al.*	BNT162b2	4 days, first dose	New diagnosis, MCD and AKI	AKI resolved, MCD improving with steroids
Agati *et al.*	BNT162b2	7 days, first dose	New diagnosis, MCD and AKI	AKI resolved, still proteinuric at 3 weeks on steroids
Kervella *et al.*	BNT162b2	10 days, second dose	MCD relapse	Steroid responsive
Schwotzer *et al.*	BNT162b2	3 days, first dose	MCD relapse	Responded to steroids + tacrolimus
Holzworth *et al.*	mRNA-1273	1 week, first dose	New diagnosis, MCD and AKI	On treatment
Komaba *et al.*	BNT162b2	8 days, first dose	MCD relapse	Steroid responsive
IgA nephropathy				
Gul Rahim *et al.*	BNT162b2	Hours, second dose	IgA nephropathy, gross hematuria	Spontaneous resolution
Negrea *et al.*	mRNA1273	Hours, second dose	IgA nephropathy, gross hematuria and increased proteinuria	2 patients, spontaneous resolution of hematuria
Perrin *et al.*	mRNA-1273	Second day, first and second dose	IgA nephropathy, gross hematuria	3 patients, 1 with transient proteinuria, spontaneous resolution
RPGN presentations				
Tan *et al.*	BNT162b2	1 day, second dose	IgA nephropathy with fibrocellular crescents, mild IFTA	Underlying IgA, unmasked post vaccination with hematuria
Anderegg *et al.*	mRNA-1273	Second dose	Crescentic IgA nephropathy	Steroid responsive
Sekar *et al.*	mRNA-1273	2 weeks, second dose	Crescentic GN, c-ANCA vasculitis	Dialysis dependent at 2 weeks
Anderegg *et al.*	mRNA-1273	First dose	Crescentic GN, c-ANCA vasculitis	Responded to cyclophosphamide + steroids
Tan *et al.*	BNT 162b2	1 day, second dose	Crescentic GN, anti-GBM	RPGN presentation
Membranous nephropathy				
Aydin *et al.*	Sinovac	2 weeks, first dose	Membranous, relapse	PLA2R positive; remission at 3 months on CNI + steroids, ACEi

ACEi, angiotensin-converting enzyme inhibitor; AKI, acute kidney injury; c-ANCA, cytoplasmic antineutrophil cytoplasmic antibodies; CNI, calcineurin inhibitor; IFTA, interstitial fibrosis an tubular atrophy; MCD, minimal change disease; RPGN, rapidly profilerative glomerulonephritis.

Carr EJ, Kronbichler A, Graham-Brown M, et al. Systematic Review of Early Immune Response to SARS-CoV-2 Vaccination Among Patients with Chronic Kidney Disease [published online ahead of print, 2021 Jul 6]. *Kidney Int Rep*. 2021;10.1016/j.ekir.2021.06.027. doi:10.1016/j.ekir.2021.06.027

Table 1. Patient clinical characteristics

Patient	Age, yr	Sex	MH	Medications	Evidence of systemic IgA vasculitis before vaccination	Temporal relation of gross hematuria to Moderna SARS-CoV-2 mRNA vaccination	Baseline (hematuria / uPCR / SCr)	Presentation (hematuria / uPCR / SCr)	Evidence of systemic IgA vasculitis after vaccination	Biopsy	Treatment	Follow-up 1 mo post second dose (hematuria / uPCR / SCr)
1	22	F	None	None since episodic steroids for IgA vasculitis at age 10 yr	Yes	48 h after second dose	4–10 / neg / 0.80	>50 / 0.40 / 0.80	No	No	None	0–3 / 0.27 / 0.80 (hematuria returned to baseline)
2	39	F	None	None	No	48 h after second dose	0–3 / neg / no baseline	>50 / 0.90 / 0.80	No	No	None	0 / below detection / 0.80 (hematuria and proteinuria returned to baseline)
3	50	M	HTN	None	No	24 h after second dose	11–25 / 2.40 / 1.17	>50 / 3.56 / 1.54	No	Yes, kidney	RAASi	11–25 / 2.20 / 1.24 (hematuria and proteinuria returned to baseline; SCr improving but above baseline)
4	67	M	HTN	RAASi	No	1 mo after first dose	0–3 / 0.05 / 1.20	>50 / 2.10 / 2.90	Yes, bilateral lower extremity maculopapular rash	Yes, skin	Steroid	0–3 / 0.09 / 1.40 (hematuria and proteinuria returned to baseline; SCr improving but above baseline)

F, female; HTN, hypertension; M, male; neg, negative; MH, medical history; RAASi, renin-angiotensin-aldosterone system inhibition; SCr, serum creatinine (in mg/dL); uPCR, urine protein-to-creatinine ratio.
Hematuria is expressed as number of red blood cells per high-powered field on urinalysis. None of the patients had episodes of gross hematuria before vaccination, and none were known to have been infected with SARS-CoV-2, although serologic testing before vaccination was not performed.

Park K, Miyake S, Tai C, Tseng M, Andeen NK, Kung VL. **Letter regarding: "A Case of Gross Hematuria and IgA Nephropathy Flare-Up Following SARS-CoV-2 Vaccination".** *Kidney Int Rep*. 2021;6(8):2246-2247.
doi:10.1016/j.ekir.2021.06.007

Case Report

Kidney Medicine

IgA Nephropathy After SARS-CoV-2 Vaccination

Matthew Abramson, Samuel Mon-Wei Yu,* Kirk N. Campbell, Miriam Chung, and Fadi Salem*

Here we present the first case of newly diagnosed IgA nephropathy (IgAN) after a SARS-CoV-2 vaccination. A 30-year-old man with no known past medical history presented with gross hematuria and subnephrotic proteinuria 24 hours after the second dose of the mRNA-1273 SARS-CoV-2 vaccine. A kidney biopsy showed IgAN. He was started on an angiotensin receptor blocker, resulting in proteinuria reduction. Similar to natural infection of SARS-CoV-2, persons who receive 2 mRNA-based vaccines demonstrate robust antibodies against the receptor-binding domain (RBD) of the S1 protein. Given the uniqueness of glycosylation of RBD and potent stimulation of immune response from mRNA-based vaccine compared to other vaccines, we hypothesize that our patient developed de novo antibodies, leading to IgA-containing immune-complex deposits. This case highlights the urgency of understanding the immunological responses to novel mRNA-based SARS-CoV-2 vaccines in more diverse populations. Despite the lack of clear causality, nephrologists should be alerted if any new-onset hematuria or proteinuria is observed.

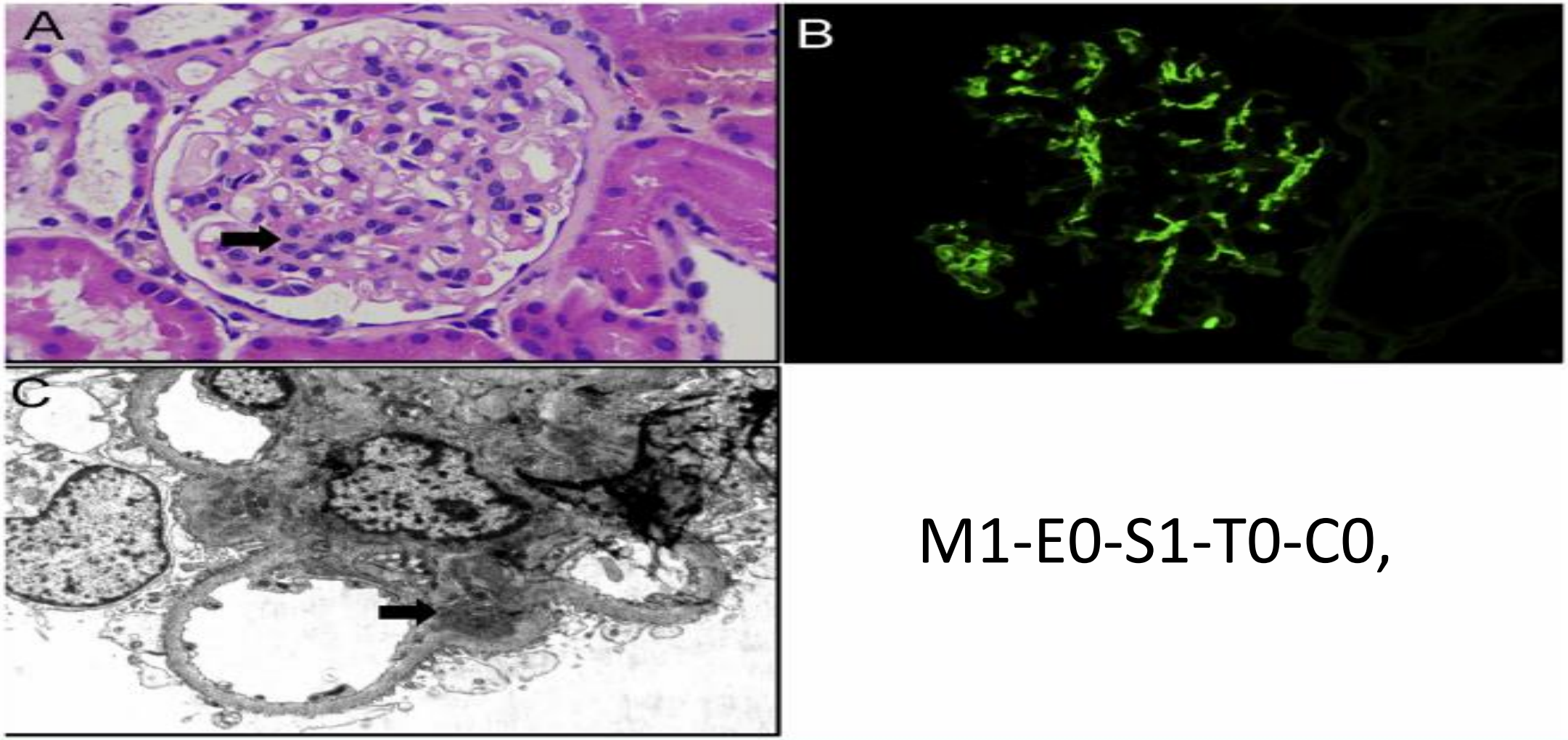
Complete author and article information provided before references.

**M.A. and S.M.Y. contributed equally to this work.*

Kidney Med. XX(XX):1-4. Published online month xx, xxxx.

doi: 10.1016/j.xkme.2021.05.002

Losartan



M1-E0-S1-T0-C0,

Figure 1. (A) Glomerular mesangial expansion and hypercellularity (black arrow) (hematoxylin-eosin, ×200). (B) Strong glomerular mesangial deposits for IgA antisera (immunofluorescence study, ×200). (C) Ultrastructural evaluation revealed immune-type electron-dense deposits involving the mesangium (black arrow) (transmission electron microscopy, ×4,000).

Table 1 | Patient demographics and clinical characteristics

	Patient 1	Patient 2	Reference range
Clinical presentation			
Age, yr/race/sex	41/Chinese/female	60/Malay/female	
Medical history	Gestational diabetes mellitus	Hyperlipidemia	
Date of vaccination			
First dose	March 3, 2021	January 29, 2021	
Second dose	March 26, 2021	February 19, 2021	
Date of hematuria	March 27, 2021	February 20, 2021	
Date of presentation to nephrology	March 28, 2021	March 31, 2021	
Blood pressure at presentation, mm Hg	153/99	188/95	
Significant laboratory results[a]			
Serum creatinine, μmol/L	153	541	
Urine dysmorphic red blood cells/μl	>200	>200	
Urine protein-to-creatinine ratio, g/g	2.03	7.58	
Serum Ig			
Serum IgG, g/L	12.90	9.95	5.49–17.11
Serum IgA, g/L	6.40	1.62	0.47–3.59
Serum IgM, g/L	1.10	0.35	0.15–2.59
Complement C3, g/L	0.83	1.11	0.90–1.80
Complement C4, g/L	0.20	0.24	0.10–0.40
Anti-nuclear antibody	1:320; Homogeneous	Negative	
Anti-GBM antibody (ELISA)	<1.5	10.0	<7 U/ml = negative; 7–10 U/ml = indeterminate; >10 U/ml = positive
Anti-GBM antibody (IF)	Not done	Positive	
Histopathology report			
Glomeruli	36 Glomeruli; 5 globally sclerosed. Focal proliferative glomerulonephritis with focal segment glomerulosclerosis; 6% cellular and 8% fibrocellular crescents	22 Glomeruli; 6 segmentally sclerosed. Diffuse crescentic glomerulonephritis with segmental sclerosis; 59% cellular, 14% fibrocellular, and 5% fibrous crescents	
Tubules and interstitium	Mild tubulointerstitial inflammation. Mild tubular atrophy and interstitial fibrosis	Acute tubular injury Mild tubular atrophy	
Vessels	Mild hyalinosis. No vasculitis or thrombotic microangiopathy	Mild intimal fibrosis	
IF	Dominant glomerular IgA staining	Trace to 1+ linear IgG staining of glomerular basement membrane	
Electron microscopy	Electron-dense deposits mostly in mesangial and paramesangial locations	No electron-dense deposits	
Treatment	Pulse methylprednisolone, followed by oral prednisolone; i.v. cyclophosphamide	Pulse methylprednisolone, followed by oral prednisolone; oral cyclophosphamide; plasma exchange	

ELISA, enzyme-linked immunosorbent assay; GBM, glomerular basement membrane; IF, immunofluorescence.
[a]Other autoantibodies, such as anti–streptomycin O titer (ASOT), anti–double-stranded DNA (anti-dsDNA), anti–neutrophil cytoplasmic antibody (ANCA) by IF, anti-myeloperoxidase, and anti–proteinase 3 antibodies, were not detected.

Tan HZ, Tan RY, Choo JCJ, Lim CC, Tan CS, Loh AHL, Tien CS, Tan PH, Woo KT. **Is COVID-19 vaccination unmasking glomerulonephritis?** Kidney Int. 2021 Aug;100(2):469-471. doi: 10.1016/j.kint.2021.05.009. Epub 2021 May 23. PMID: 34033857; PMCID: PMC8141343.

1) Complejos inmunes formados por IgA1 patógena e IgG o IgA específica
2) Una eliminación hepática deteriorada
3) Mayor afinidad por las células mesangiales. (1)

Mecanismos fisiopatológicos: IgAN → **Multi Hit**

1) Predisposición genética
2) Eventos desencadenantes: Infecciones, toxico ambientales **(2)**

¿Vacunas? (3)

Table 1. Vaccine-associated kidney diseases (Original).

Vaccine	Kidney disease/pathology reported in the literature	References
Influenza	• Nephrotic syndrome: MCD, MN • Rhabdomyolysis with ATN, AIN • Pauci-immune GN/ Renal vasculitis • HSP • Kidney graft rejection	5-30
Hepatitis B	• Nephrotic syndrome: MCD • Lupus nephritis: Class IV	31-34
Pneumococcal	• Crescentic GN due to anti-GBM disease • Nephrotic syndrome: MCD	35,36
Pertussis	• Renal vasculitis	37
Diphtheria pertussis tetanus	• Cryoglobulinemia and proliferative GN	38
Tetanus diphtheria poliomyelitis	• Nephrotic syndrome: MCD	39
Smallpox	• Nephrotic syndrome: MN	40
Measles	• Nephrotic syndrome: MCD	41
Rabies	• Nephrotic syndrome	42
Meningococcal	• Relapse of nephrotic syndrome	43
BCG	• Renal granulomas • AIN with or without granulomas • HSP • Nephrotic syndrome: MN	45

MCD: Minimal change disease, MN: Membranous nephropathy, ATN: Acute tubular necrosis, AIN: Acute interstitial nephritis, HSP: Henoch–Schoenlein Purpura, GN: Glomerulonephritis, GBM: Glomerular basement membrane, BCG: Bacillus Calmette–Guerin.

1. Novak J, Julian BA, Tomana M, Mestecky J. IgA glycosylation and IgA immune complexes in the pathogenesis of IgA nephropathy. Semin Nephrol. 2008;28(1):78-8
2. Lai KN. Pathogenesis of IgA nephropathy. Nat Rev Nephrol. 2012;8(5):275-283.
3. Patel C, Shah HH. Vaccine-associated kidney diseases: a narrative review of the literature. Saudi J Kidney Dis Transpl. 2019;30(5):1002-1009

JCI The Journal of Clinical Investigation

Humoral immune response to influenza vaccination in patients with primary immunoglobulin A nephropathy. An analysis of isotype distribution and size of the influenza-specific antibodies.

A W van den Wall Bake, … , N Masurel, L A van Es

J Clin Invest. 1989;84(4):1070-1075. https://doi.org/10.1172/JCI114269.

Research Article

Primary IgA nephropathy (IgAN) is characterized by mesangial deposits of IgA1, increased serum IgA1 levels, and circulating immune complexes containing predominantly IgA1. It has previously been found that patients with IgAN have a higher than normal IgA response to vaccination, but the IgA subclasses have not been studied. To investigate whether the IgA hyperresponsiveness is limited to the subclass IgA1, which is involved in the pathogenesis of IgAN, we compared the immune responses of 18 patients with 22 healthy controls after intramuscular vaccination with inactivated influenza virus. Antibody titers were significantly higher (P less than 0.0001) for the IgA1 subclass in patients versus controls, but not for the other isotypes. A substantial portion of the IgA and IgA1 antiinfluenza immune response comprised polymers in both patients and controls. There was no preferential r more monomeric IgA1 antibodies than controls. These limited to the subclass IgA1 and mainly expressed by

18 pacientes (14 hombres y 4 mujeres con una edad media de 36,0 años; rango, 24-78 años) con IgAN comprobada por biopsia.

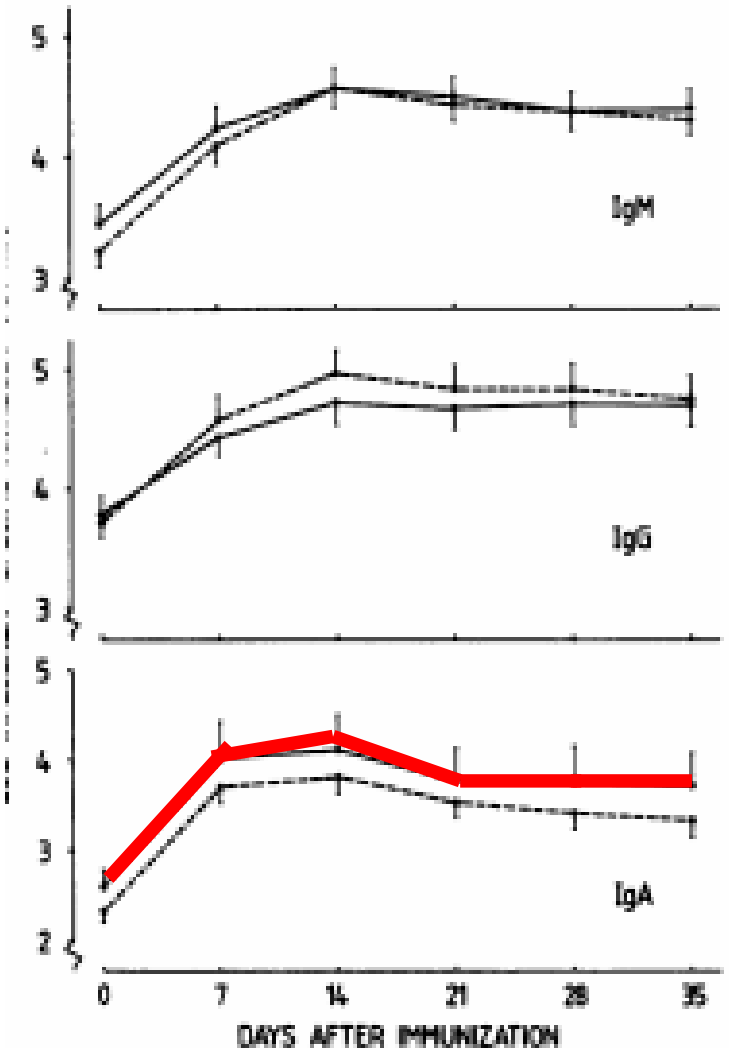


Figure 1. Plot of the IgM, IgG, and IgA antiinfluenza titers, transformed to their natural logarithms, versus time after immunization. *Solid line,* mean response in patients (n = 18); *dashed line,* controls (n = 22); *vertical bars,* SEM. (*Top*) IgM immune response; (*middle*) IgG response; (*bottom*) IgA response. Patients were not significantly different from controls for IgM (P = 0.36) or IgG (P = 0.31). The difference between patients and controls was marginally significant for IgA (P = 0.058).

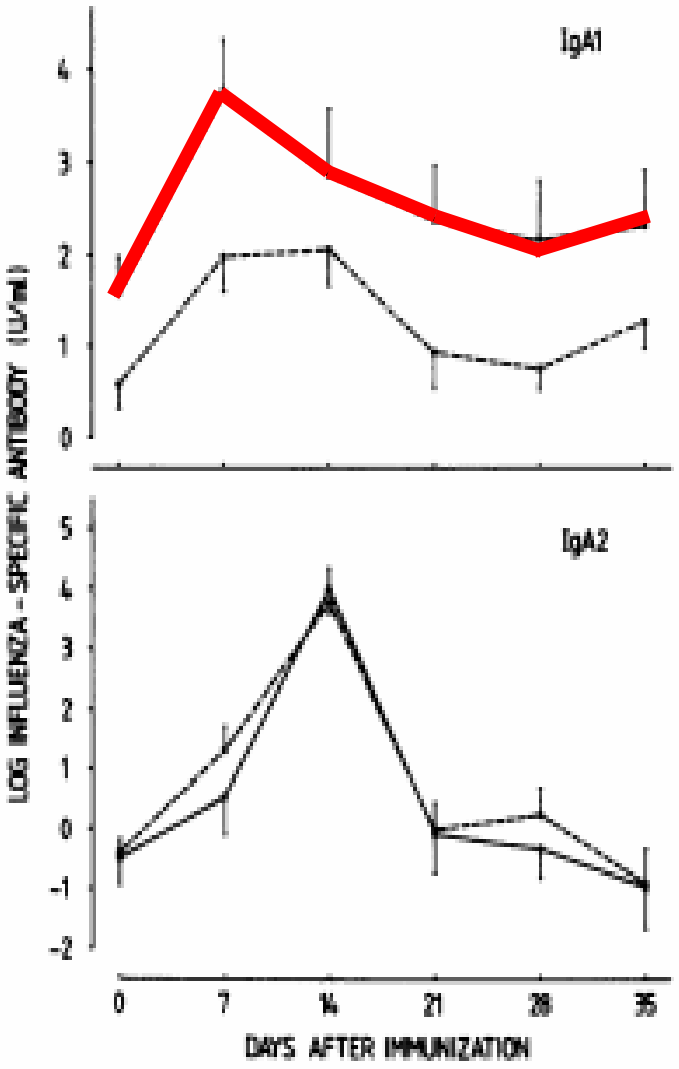


Figure 2. Plot of the IgA1 and IgA2 antiinfluenza titers, transformed to their natural logarithms, versus time after immunization. *Solid line,* mean response in patients (n = 18); *dashed line,* controls (n = 22); *vertical bars,* SEM. (*Top*) IgA1 immune response; (*bottom*) IgA2 response. Patients had a significantly higher IgA1 antiinfluenza response than controls (P < 0.0001). The IgA2 response was not significantly different from controls (P = 0.44).

Clin. exp. Immunol. (1987) **68,** 33–38

Immune response to oral polio vaccine in patients with IgA glomerulonephritis

P. O. LEINIKKI, J. MUSTONEN & A. PASTERNACK *Department of Biomedical Sciences and Department of Clinical Sciences, University of Tampere, Tampere, Finland*

(Accepted for publication 22 October 1986)

SUMMARY

Oral poliovirus vaccine was used to immunize 51 patients with IgA glomerulonephritis and 44 healthy controls. The patients showed an enhanced antibody response compared to controls. This was apparent in a higher frequency of strong increases in neutralizing antibody titres during the course of immunization as well as higher levels of virus-specific IgA-class antibodies. IgG-class antibodies showed similar activity in both groups. In patients the neutralizing antibodies correlated with the virus-specific IgA-class antibodies, suggesting that the IgA-antibodies synthesized by the patients are functionally competent antibodies

Sample	Test	Mean values (EIU) IgA-GN	Mean values (EIU) Controls	Statistical significance*
I	ELISA IgG	90·5	90·8	NS
	ELISA IgA	62·3	31·6	$P < 0{\cdot}001$
	NT	220	150	NS
II	ELISA IgG	99·4	99·3	NS
	ELISA IgA	67·5	32·6	$P < 0{\cdot}001$
	NT	454	276	NS
III	ELISA IgG	101·6	103·7	NS
	ELISA IgA	68·6	39·5	$P < 0{\cdot}001$
	NT	651	552	NS

ELISA, enzyme-linked immunosorbent assay; NT, neutralization test.

* Tested by Mann-Whitney test.

Clin Kidney J (2015) 8: 325–328
doi: 10.1093/ckj/sfv027
Advance Access publication 6 May 2015

Exceptional Case

Influenza virus vaccination and kidney graft rejection: causality or coincidence

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Table 1. Comparison of the three cases

	Case 1	Case 2	Case 3
Time from vaccination until hospitalization (days)	58	53	34
Kidney biopsy	Acute and chronic humoral rejection, C4d positive	Acute cellular rejection (Banff-type IA), C4d negative	Recurrent IgA nephropathy, C4d negative
Urine protein prior to vaccination (g/L)	0.418	Undetectable	Undetectable
Urine protein after vaccination (g/L)	0.732 (5 months after admission)	0.2 (2 months after)	4.98 (3½ months after)

1) Complejos inmunes formados por IgA1 patógena e IgG o IgA específica
2) Una eliminación hepática deteriorada
3) Mayor afinidad por las células mesangiales. (1)

Mecanismos fisiopatológicos:

Multi Hit

Vacunas mRNA

1.- Formación de Acs anti glicanos que reaccionan de forma cruzada vs IgA1 sub galactosidada pre formada. **(3)**

2.- Aumento de la producción de IgA patógena, similar a lo visto en la vacunación vs influenza. **(3)**

1) Predisposición genética
2) Eventos desencadenantes: Infecciones, toxico ambientales **(2)**

1. Novak J, Julian BA, Tomana M, Mestecky J. IgA glycosylation and IgA immune complexes in the pathogenesis of IgA nephropathy. Semin Nephrol. 2008;28(1):78-8
2. Lai KN. Pathogenesis of IgA nephropathy. Nat Rev Nephrol. 2012;8(5):275-283.
3. Abramson M, Mon-Wei Yu S, Campbell KN, Chung M, Salem F. IgA Nephropathy After SARS-CoV-2 Vaccination [published online ahead of print, 2021 Jul 14]. Kidney M 2021;10.1016/j.xkme.2021.05.002. doi:10.1016/j.xkme.2021.05.002

AJKD

Case Report

Minimal Change Disease Following the Pfizer-BioNTech COVID-19 Vaccine

Larissa Lebedev, Marina Sapojnikov, Alexander Wechsler, Ronen Varadi-Levi, Doron Zamir, Ana Tobar, Nomy Levin-Iaina, MD, Shlomo Fytlovich, and Yoram Yagil

We report on the development of minimal change disease (MCD) with nephrotic syndrome and acute kidney injury (AKI), shortly after first injection of the BNT162b2 COVID-19 vaccine (Pfizer-BioNTech). A 50-year-old previously healthy man was admitted to our hospital following the appearance of peripheral edema. Ten days earlier, he had received the first injection of the vaccine. Four days after injection, he developed lower leg edema, which rapidly progressed to anasarca. On admission, serum creatinine was 2.31 mg/dL and 24-hour urinary protein excretion was 6.9 grams. As kidney function continued to decline over the next days, empirical treatment was initiated with prednisone 80 mg/d. A kidney biopsy was performed and the findings were consistent with MCD. Ten days later, kidney function began to improve, gradually returning to normal. The clinical triad of MCD, nephrotic syndrome, and AKI has been previously described under a variety of circumstances, but not following the Pfizer-BioNTech COVID-19 vaccine. The association between the vaccination and MCD is at this time temporal and by exclusion, and by no means firmly established. We await further reports of similar cases to evaluate the true incidence of this possible vaccine side effect.

Complete author and article information provided before references.

Am J Kidney Dis. 78(1):142-145. Published online April 8, 2021.

doi: 10.1053/j.ajkd.2021.03.010

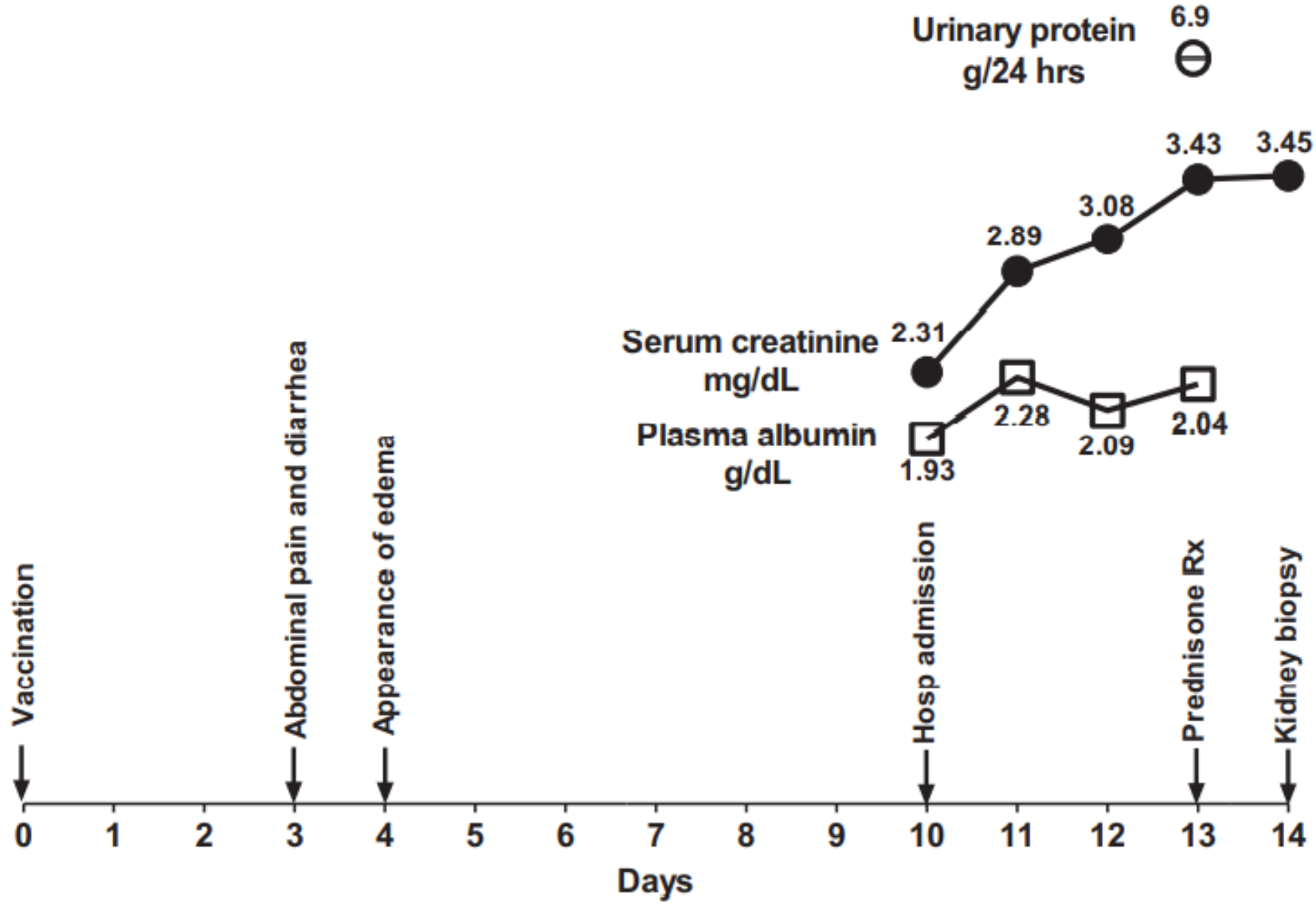
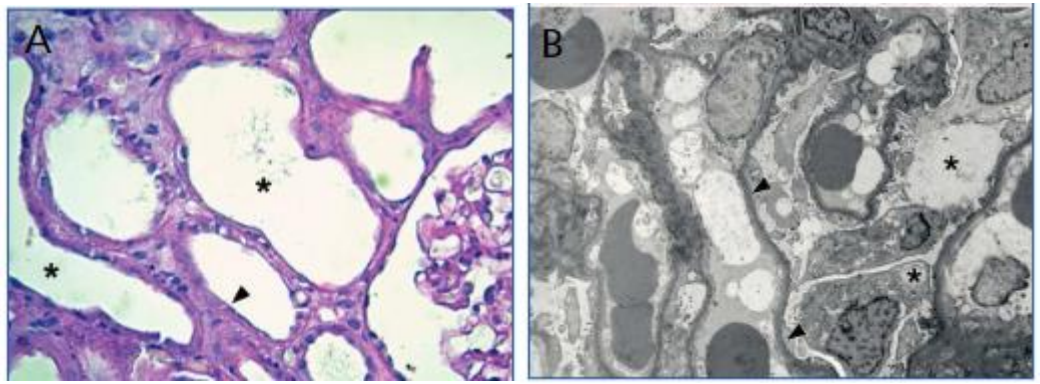


Figure 1. Timeline of clinical events from time of vaccination and until the kidney biopsy was performed.

Minimal change disease following influenza vaccination and acute renal failure: just a coincidence?

Nefrologia 2012;32(3):414-5
doi:10.3265/Nefrologia.pre2012.Feb.11370

Hombre de 44 años ingresó en con edema en cara y piernas y linfadenopatía cervical que se presentó 18 días después de la vacunación contra la influenza (Agrippal®, Novartis).



1) Disfunción de las células T con producción de un factor de permeabilidad.

2) "intercomunicación" entre células dendríticas y linfocitos con la consiguiente producción de citocinas intrarrenales.

3) La modulación del citoesqueleto de actina a nivel del diafragma de filtración

4) Desestabilización de la proteína sinaptopodina 5

BMC Nephrology

BioMed Central

Case report

Open Access

Minimal change nephrotic syndrome in an 82 year old patient following a tetanus-diphteria-poliomyelitis-vaccination

Christian Clajus[1], Janine Spiegel[1], Verena Bröcker[2], Christos Chatzikyrkou[1] and Jan T Kielstein*[1]

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This article is available from: http://www.biomedcentral.com/1471-2369/10/21

Table 1: Summary of MCNS following vaccination in literature

Vaccination against	Tetanus-diphteria-poliomyelitis-vaccination	Pneumococcus [6]	Influenza [7]	Hepatitis B [3]	Hepatitis B [4]	Hepatitis B [5]
Age [years]	82	67	65	3	40	4
Gender	female	female	female	male	female	male
Baseline creatinine	76 μmol/l	no data	normal	44 μmol/l	normal	no data
Peak creatinine	138 μmol/l	274 μmol/l	158 μmol/l	no data	no data	no data
Baseline proteinuria	negative in dip-stick	past history unremarkable	no data	past history unremarkable	past history unremarkable	past history unremarkable
Peak proteinuria	12 g/day	10.4 g/day	13.2 g/day	24.8 g/day	8 g/day	1.25 g/day
Vaccination to onset of symptoms	4 weeks	4 months	4 days	17 days	after 2nd inoculation	8 days
Biopsy	typical minimal change lesion (MCL)	MCL and mild interstitial nephritis	typical minimal change lesion (MCL)	not indicated	minimal change nephropathy	not indicated
Treatment	Steroids 1 mg/kg bw ACE-inhibitor	750 mg Steroids for 3 days; followed by 40 mg/day	None specific	Steroids 2 mg/kg bw	Steroids (12 mg every other day)	Steroids 2 mg/kg bw
Renal function/ follow up	80 μmol/l 6 months after diagnosis	Urinary protein neg. after one year; 15 mg Steroids/day	Clearacnce 95 ml/min after one year	no data	no data	Complete remission

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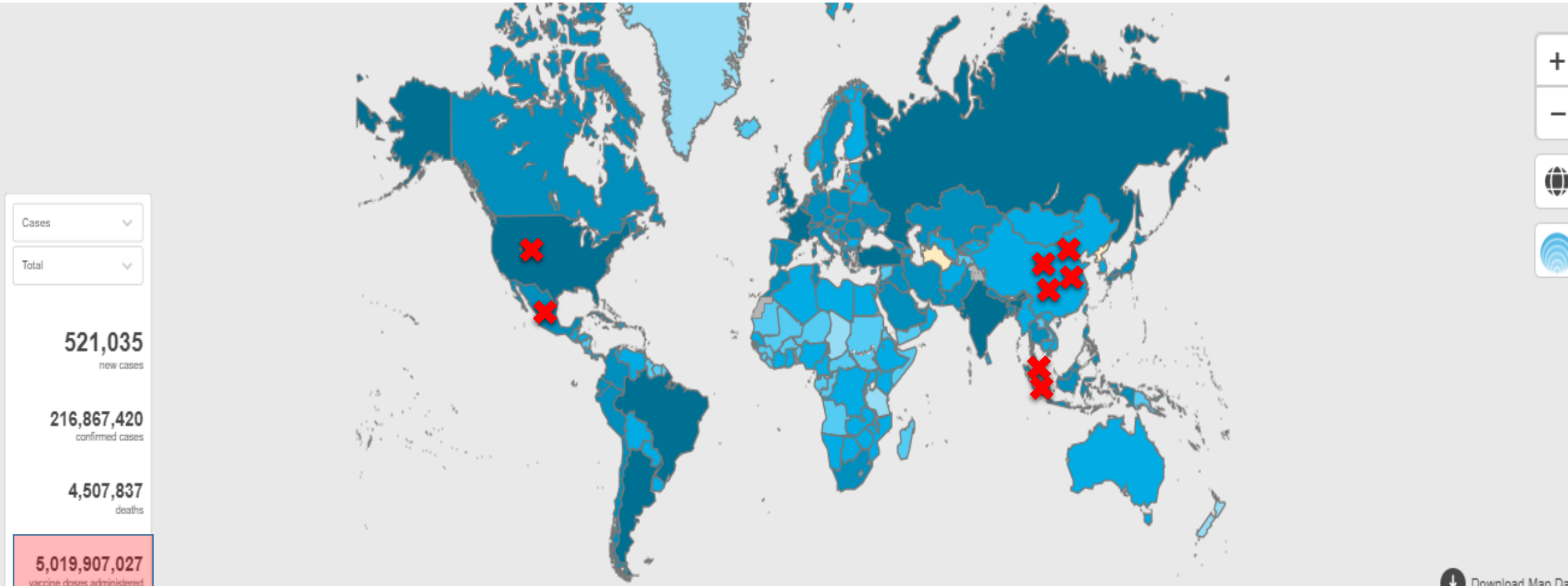

Cases

Total

521,035
new cases

216,867,420
confirmed cases

4,507,837
deaths

5,019,907,027
vaccine doses administered

Download Map Da

Conclusiones:

- No existen elementos suficientes para establecer causalidad.
- ¿Coincidencia?.
- Incidencia **“extremadamente baja”.**
- Los pacientes con IgAN tienen una respuesta inmune más alta de lo normal a la vacuna contra antígenos virales (influenza, polio) limitada al isotipo IgA1.
- Necesidad de farmacovigilancia.
- **¿Tratamiento?**, basado en recomendaciones de GN de base.
- Valorar **“riesgo – beneficio”** de esquemas de inmunosupresión en pandemia.
- Las vacunas son por mucho **“la mejor alternativa”**