The majority of pts with myeloma kidney didn't have a previous MM diagnosis and the majority of pts submitted to renal biopsy didn't have a MG previously identified. Although the reason for KB was different in the 3 major lesions identified, some pts with AL amyloidosis presented also myeloma kidney, as did half of the pts with LCDD. Therefore, KB constitutes the gold standard to establish diagnosis and ascertain therapeutic in pts with MG and suspicion of renal involvement

RENAL INVOLVEMENT IN MONOCLONAL GAMMOPATHIES

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INTRODUCTION AND AIMS

Monoclonal gammopathies (MG) are a group of disorders characterized by the proliferation of a clone of plasma cells, frequently associated with organ dysfunction.

The most common MG are MG of undetermined significance (MGUS), smoldering multiple myeloma, multiple myeloma (MM), light-chain amyloidosis (AL) and monoclonal immunoglobulin deposition disease (light chain and heavy chain deposition disease).

The aim of this study was to evaluate the histological findings of kidney biopsies and clinical data in patients with MG, with or without MM criteria

PATIENTS AND METHODS

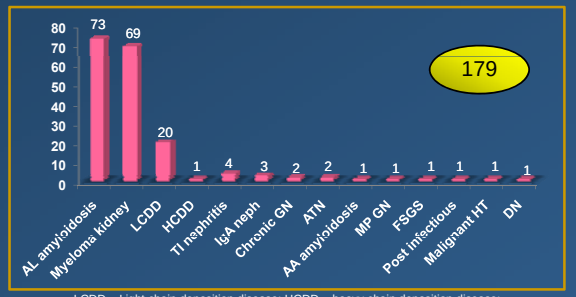
This was a retrospective review of all kidney biopsies (KB) performed in our laboratory in patients with MG in the last 30 years

Clinical data: age, gender, race, associated diseases, presence of MM criteria, reason for biopsy, dialysis requirement

Laboratorial data: serum creatinine (Scr), 24h proteinuria, presence of hematuria, serum and/or urinary monoclonal protein, light chain classe

Morphological data: type of renal disease, interstitial infiltrate, interstitial fibrosis and tubular atrophy degree, vessels status, immunofluorescence results

RESULTS



LCDD – Light chain deposition disease; HCDD – heavy chain deposition disease; TI nephrities – tubulointerstitial nephrities; IgA neph – IgA nephropathy; ATN – acute tubular necrosis; MP GN – membranoproliferative glomerulonephrities; FSGS – focal and segmental glomerulosclerosis; Malignant HT – malignant hypertension; DN – diabetic nephropathy

Of these patients, only

- ✓ 49.2% were known to have a MG
- ✓ 24.5% were known to have MM

Myeloma kidney - 83

- ✓ 69 isolated myeloma kidney
  - ✓ 2 with ATN
  - ✓ 1 with minimal change disease
  - ✓ 1 with crescentic glomerulonephrities
- ✓ 10 associated with LCDD
- ✓ 4 associated with AL amyloidosis

Clinical characteristics

	AL amyloidosis (n=73)	Myeloma kidney (n=69)	LCDD (n=20)
Male gender (%)	42.5% (31)	42% (29)	55% (11)
Age (years)	64.6±10	66±9.7	60.2±10.5
Caucasian race (%)	90.9% (40/44)	100% (30/30)	100% (11/11)
Dialysis requirement (%)	6.3% (4/63)	90% (36/40)	56.3% (9/16)
Presence of known MM (%)	12.3% (9)	39.1% (27)	25% (5)
Presence of known MG (%)	27.4% (20)	62.3% (43)	40% (8)
Scr (mg/dl)	1.9±1.5	6.5±3.5	5.9±6
Proteinuria (g/24h)	7.3±5.8	2.4±4.4	5.2±3.2
Hematuria (%)	45.9% (17/37)	58.3% (14/24)	100% (5/5)
Reason for kidney biopsy (%)			
Nephrotic syndrome	68.5% (50)	5.8% (4)	30% (6)
Nephritic syndrome	4.1% (3)	2.9% (2)	0%
Non nephrotic proteinuria	9.6% (7)	4.3% (3)	10% (2)
Acute kidney injury	4.1% (3)	43.5% (30)	20% (4)
Rapidly progressive renal failure	2.7% (2)	26.1% (18)	30% (6)
Hematoproteinuria with/out CKD	4.1% (3)	15.9% (11)	10% (2)
Light chain classe	λ 82% (60)	Λ 27; k 25	K 55% (11)
Heavy chain classe (n)			
No	14	27	14
IgG / IgA / IgM	16 / 7 / 1 / 0	11 / 6 / 0 / 1	1 / 0 / 2 / 0

Morphologic characteristics

	AL amyloidosis	Myeloma kidney	LCDD
Mean glomeruli number	11.6±8.6	8.7±5.3	9.5±4.9
Mean lobulated glomeruli	0%	1.4% (1)	50% (10)
Mean sclerosed glomeruli	1.1±1	1±1.9	1±1.5
Myeloma kidney (%)	5.5% (4)	100%	50% (10)
Interstitial fibrosis			
No	26% (19)	2.9% (2)	0%
Mild	30% (22)	4.3% (3)	20% (4)
Moderate	13.7% (10)	27.5% (19)	40% (8)
Severe	30% (22)	65% (45)	40% (8)
Tubular atrophy			
No	30% (22)	4.3% (3)	5% (1)
Mild	33% (24)	4.3% (3)	20% (4)
Moderate	19% (14)	35% (24)	35% (7)
Severe	18% (13)	56.5% (39)	40% (8)
Immunofluorescence			
Other than k / λ	41.1% (30)	20.3% (14)	15% (3)

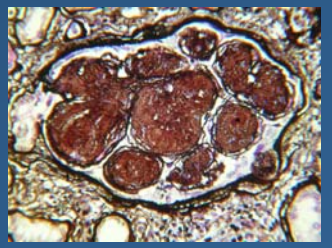


Figure 1 – Nodular glomerulosclerosis with thickness of glomerular and tubular basement membranes (Methenamine Silver x 400)

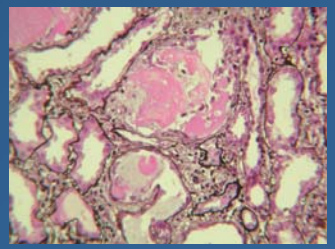


Figure 2 – Cast nephropathy (Methenamine Silver x 250)

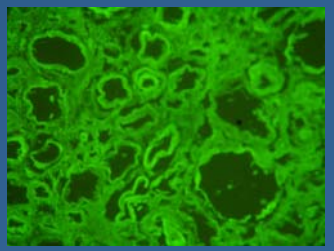


Figure 3 – Kappa light chain linear deposits along the tubular basement membrane (IF x250)

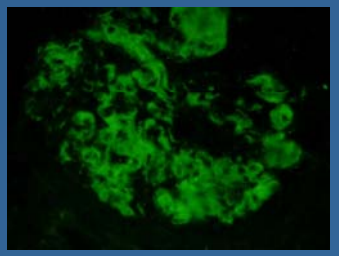


Figure 4 – AL amyloidosis (IF x 400)

CONCLUSIONS

MG may be associated with a variety of renal disorders, some usually related to monoclonal chain, but others not typically related.
The majority of patients with myeloma kidney didn't have a previous MM diagnosis and the majority of patients submitted to renal biopsy didn't have a MG previously identified.
Although the reason for KB was different in the 3 major lesions identified, some patients with AL amyloidosis presented also myeloma kidney, as did half of the patients with LCDD.
Therefore, KB constitutes the gold standard to establish diagnosis and ascertain therapeutic in patients with MG and suspicion of renal involvement.

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