MO134

COVID-19-ASSOCIATED KIDNEY INJURY IS CHARACTERIZED BY ACUTE TUBULAR NECROSIS AND CAPILLARY CONGESTION WITH EVIDENCE FOR SARS-COV-2 IN THE NEPHRON

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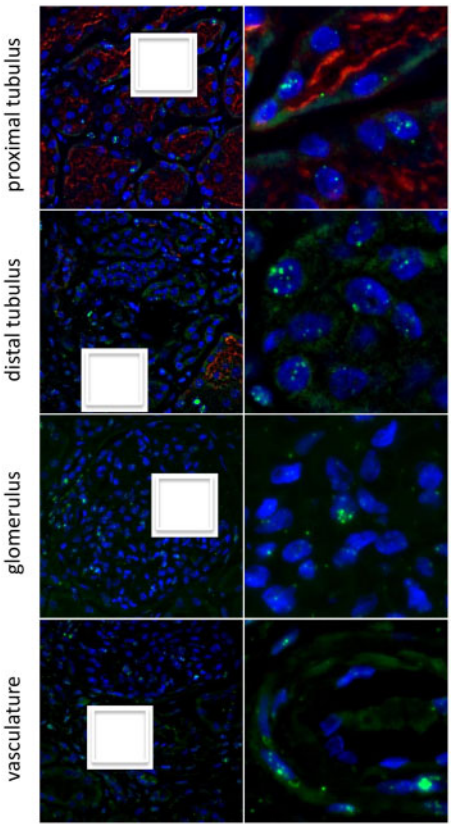
BACKGROUND AND AIMS: Kidney damage has been reported in COVID-19 patients. Despite numerous reports about COVID-19-associated nephropathy, the factual presence of the SARS-CoV-2 in the renal parenchyma remains controversial. **METHOD:** We consecutively performed 16 immediate (≤3h) *post-mortem* renal biopsies in patients diagnosed with COVID-19. Kidney samples from 5 patients who died from sepsis and were free from COVID-19 were used as controls. Samples were methodically evaluated by 3 pathologists. Virus detection in the renal parenchyma was performed in all samples by bulk RNA RT-PCR (E and N1/N2 genes), immunostaining (nCoV2019 N-Protein), fluorescent *in situ* hybridization (nCoV2019-S) and electron microscopy.



MO134 Figure: Detection and spatial distribution of viral RNA using fluorescence *in situ* hybridization

The first (overview) and second (targeted zoom) columns display positive signal for viral RNA in different renal compartments, including proximal and distal tubules, glomeruli and vessels. nCoV2019-S RNA is in green; *Lotus tetragonolobus* lectin (LTL) is in red; DAPI is in blue.

RESULTS: The mean age of our COVID-19 cohort was 68.2±12.8 years, most of whom were males (68.7%). Proteinuria was observed in 53.3% of cases, while acute kidney injury occurred in 60% of cases. Acute tubular necrosis of variable severity was found in all cases, with no tubular or interstitial inflammation. There was no difference in acute tubular necrosis severity between the patients with COVID-19 *versus* control samples. Congestion in glomerular and peri-tubular capillaries was respectively observed in 56.3 and 87.5% of patients with COVID-19 compared to 20% of controls, with no evidence of thrombi. The nCoV2019 N-Protein was detected in proximal tubules and also at the basolateral pole of scattered cells of the distal tubules in 9/16 cases. *In situ* hybridization confirmed these findings. RT-PCR of kidney total RNA detected SARS-CoV-2 N gene in one case. Electron microscopy did not show typical viral inclusions.
CONCLUSION: Our immediate *post-mortem* kidney samples from patients with COVID-19 highlight a congestive pattern of acute kidney injury, with no significant glomerular or interstitial inflammation. Immunostaining and *in situ* hybridization suggest that SARS-CoV-2 is present in various segments of the nephron.