AKI in critically ill patients with COVID-19

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Disclosures

> No financial conflicts to disclose
Epidemiology of AKI in COVID-19

<table>
<thead>
<tr>
<th>Location</th>
<th>N</th>
<th>ICU</th>
<th>CKD</th>
<th>AKI</th>
<th>RRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>5700</td>
<td>14.3%</td>
<td>8.5%</td>
<td>3.5%</td>
<td>3.2%</td>
</tr>
<tr>
<td>California</td>
<td>377</td>
<td>30%</td>
<td>12.7%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Wuhan</td>
<td>191</td>
<td>26%</td>
<td>1%</td>
<td>15%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Lancet 2020; 395: 1054–62 Published Online, March 9, 2020 https://doi.org/10.1016/S0140-6736(20)30566-3
JAMA. Published online April 22, 2020. doi:10.1001/jama.2020.6775
JAMA. Published online April 24, 2020. doi:10.1001/jama.2020.7202
Pathophysiology of AKI in COVID-19

> Postulated mechanisms:
  – Hypovolemia – diuresis, positive pressure ventilation
  – ATN – cytokine storm, shock
  – Glomerular – case reports
  – Venous congestion – PE/RV failure
  – Thrombotic Microangiopathy
  – Direct viral cytotoxicity

> Autopsy:
  – 26 patients – dominant finding ATN
# Management of AKI in COVID-19

<table>
<thead>
<tr>
<th>High</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid subclavian catheters if possible</td>
<td>Discontinue all nephrotoxic agents when possible</td>
<td>Ensure volume status and perfusion pressure</td>
<td>Consider functional hemodynamic monitoring</td>
</tr>
<tr>
<td></td>
<td>Monitor Serum creatinine and urine output</td>
<td>Avoid hyperglycemia</td>
<td>Consider alternatives to radiocontrast procedures</td>
</tr>
<tr>
<td>Non-invasive diagnostic workup</td>
<td>Consider invasive diagnostic workup</td>
<td>Check for changes in drug dosing</td>
<td>Consider Renal Replacement Therapy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Consider ICU admission</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Avoid subclavian catheters if possible</td>
</tr>
</tbody>
</table>

Renal replacement therapy

> CRRT vs PIRRT/SLED vs IHD
  - Supply chain
  - Anticoagulation
> Peritoneal dialysis

https://www.asn-online.org/covid-19/
Unanswered questions

> Better define risk factors for AKI
> Mechanism of renal injury
> Optimizing renal replacement therapy in surge conditions
> ......