Steroids in COVID-19

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COVID-19 Disease Course

<table>
<thead>
<tr>
<th>Incubation Period</th>
<th>Acute Mild Phase *</th>
<th>ARDS/Pro-inflammatory Phase</th>
<th>Recovery</th>
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<td>5.1 days (median)</td>
<td>5-10 days</td>
<td>Days - weeks</td>
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- **Symptom onset**
- **Hallmarks:** dyspnea, tachypnea, hypoxemia

* Acute Mild Phase: nonspecific symptoms. Most commonly fevers, cough, myalgias, fatigue. Nausea, diarrhea reported <50% of the time

References:
- Pan L. Lancet 2020. [Doi: 10.1016/S0140-6736(20)30566-3](https://doi.org/10.1016/S0140-6736(20)30566-3)
- Siddiqi H. J. P. T. 2020. [Doi: 10.1038/s41390-020-03112](https://doi.org/10.1038/s41390-020-03112)
## COVID-19 Disease Course

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Reference:
- Pan L et al. 2020. doi:10.1016/S1473-3099(20)30113-4
- Siddiqi H et al. 2020. doi:10.1016/j.jhsus.2020.03.012
COVID-19 Disease Course

- Cytokine Storm
- Fibrotic ARDS

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Symptom onset
Hallmarks: dyspnea, tachypnea, hypoxemia

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References:
- Richterman and Meyerowitz, Partners ID Grand Rounds 3/2
### Table 1: Baseline characteristics by randomized allocation and level of respiratory support received

<table>
<thead>
<tr>
<th></th>
<th>Treatment allocation</th>
<th>Respiratory support received at randomization</th>
<th>Invasive mechanical ventilation</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Dexamethasone (n=2104)</td>
<td>Usual care (n=4321)</td>
<td>No oxygen received (n=1635)</td>
</tr>
<tr>
<td>Age, years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;70</td>
<td>66.9 (15.4)</td>
<td>65.8 (15.8)</td>
<td>69.3 (17.5)</td>
</tr>
<tr>
<td>≥70 to &lt;80</td>
<td>1142 (54%)</td>
<td>2506 (58%)</td>
<td>660 (43%)</td>
</tr>
<tr>
<td>≥80</td>
<td>467 (22%)</td>
<td>860 (20%)</td>
<td>338 (22%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1338 (64%)</td>
<td>2750 (64%)</td>
<td>892 (58%)</td>
</tr>
<tr>
<td>Female*</td>
<td>756 (36%)</td>
<td>1571 (36%)</td>
<td>643 (42%)</td>
</tr>
<tr>
<td>Number of days since symptom onset</td>
<td>8 (5-13)</td>
<td>9 (5-13)</td>
<td>6 (3-10)</td>
</tr>
</tbody>
</table>
b) No oxygen received (n=1535)
RR 1.22 (95% CI 0.93−1.61)
p=0.14

Dexemethasone
Usual care

Days since randomization
0 7 14 21 28
501 463 420 394 383
1034 969 890 856 832

0 10 20 30 40 50
Mortality, %

Number at risk:
Dexamethasone 1279
Usual care 2804

0 7 14 21 28
Days since randomization

Usual care
Dexamethasone

c) Oxygen only (n=3883)
RR 0.80 (95% CI 0.70−0.92)
p=0.002

Usual care
Dexamethasone

Days since randomization
0 7 14 21 28
1107 1004 671 440
1680 1800

0 10 20 30 40 50
Mortality, %

0 7 14 21 28
Days since randomization

Usual care
Dexamethasone

Number at risk:
Dexamethasone 324
Usual care 683

0 7 14 21 28
124 240 246 230 224
359 369

Usual care
Dexamethasone

d) Invasive mechanical ventilation (n=1007)
RR 0.65 (95% CI 0.51−0.82)
p<0.001

Usual care
Dexamethasone

Days since randomization
0 7 14 21 28
200 248 230 224
474 418 389

0 10 20 30 40 50
Mortality, %

Number at risk:
Dexamethasone 129
Usual care 569
Steroids and RNA Clearance (MERS-CoV)

- Significant delay in MERS-CoV RNA Clearance
  - Observed when corticosteroids were initiated early
  - Late initiation (> 7 days) not associated with delayed clearance

CoronaViruses and Steroids

From: Impact of corticosteroid therapy on outcomes of persons with SARS-CoV-2, SARS-CoV, or MERS-CoV infection: a systematic review and meta-analysis

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Corticosteroid Mean ± SD</th>
<th>Control Mean ± SD</th>
<th>Mean Difference IV, Fixed, 95% CI</th>
</tr>
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<tbody>
<tr>
<td>Arabi 2018</td>
<td>20.67 ± 16.25</td>
<td>19.33 ± 20.98</td>
<td>8.2% [1.34 [-7.85, 10.53]]</td>
</tr>
<tr>
<td>Lee 2004</td>
<td>13.75 ± 3.01</td>
<td>9.75 ± 2.57</td>
<td>91.8% [4.00 [1.26, 6.74]]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td></td>
<td>38 ± 100.0%</td>
<td>3.78 [1.16, 6.41]</td>
</tr>
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</table>

Comparison of virus clearness between corticosteroid and comparator.

Steroids in Non COVID ARDS


Take home points

- Steroids have a role to play in intubated patients with SARS-CoV-2 pneumonia/ARDS

Issues to consider
- Unclear role in the non-intubated patient
- Timing of initiation
- Side effects
- Long term consequences