

**Maine Medical Center
Department of Emergency Medicine
Journal Club Summary Template**

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| Date: 11/19/2020 | Presenter Name: Weeden Bauman |
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| <p>Article Citation: Published in Journal of Medical Virology in August 2020 Authors are from Department of Anesthesia Pain Medicine and Critical Care in AIIMS New Delhi, India and Department of Critical and Intensive Care, JPN Apex Trauma Centre, AIIMS, New Delhi, India</p> |
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| Country(ies): India |
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| Funding Source(s): None Stated <input type="checkbox"/> None Stated |
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| Purpose |
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| <p>Research Question(s): Are systemic steroids safe and/or effective in patients with COVID-19? More specifically, is there a benefit in mortality, duration of hospital stay, or period of viral shedding?</p> <p style="text-align: right;"><input type="checkbox"/> None Stated</p> |
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| Hypotheses: None stated |
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| Study Purpose: This is a systematic review and meta-analysis of multiple studies |
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| Methods |
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| <p>Study Design: Systematic search of major electronic databases (Pubmed and Medline, Google scholar, and preprint platforms) was performed by two researchers, looking between dates of Jan 1 2020 – Aug 19 2020. Searched “COVID-19” AND “glucocorticoids” OR “methylprednisolone” OR “prednisolone” OR “cortisone” OR “dexamethasone” OR “hydrocortisone”</p> |
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| <p>Outcome(s) [or Dependent Variable]: Mortality (primary outcome), Duration of hospital stay (secondary outcome), Period of viral shedding (secondary outcome)</p> |
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| <p>Intervention [or Independent Variable]: Various regimens of steroids</p> |
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| Ethics Review: <input type="checkbox"/> IRB Review <input type="checkbox"/> IACUC Review <input type="checkbox"/> Other: <input checked="" type="checkbox"/> None Stated |
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| Research Setting: Electronic data collection from various studies |
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| Study Subjects: 249 initial studies → after exclusion criteria, screening, etc → 12 studies (2 RCTs and 10 cohort studies) |
| Inclusion Criteria: RCTs, controlled clinical trials, prospective and retrospective comparative cohort studies, case control studies, cross sectional studies, and case series with a control group were included |
| Exclusion Criteria: Languages other than English, absence of essential data, could not retrieve full text. Abstracts were screened for “irrelevant articles” as well. |
| Study Interventions: See chart for various treatment regimens, including methylprednisolone, dexamethasone, hydrocortisone, etc |
| Study Groups: See chart |
| Instruments/Measures Used: NA |
| Data Collection: Data from included studies “extracted independently by two researchers” with the use of a preconceived data extraction sheet. This included details of intervention, control groups, mortality, duration hospital stay, and duration for viral clearance. |
| Data Analysis and Statistical Analyses used: Meta-analyses along with subgroup analyses using Review Manager version 5.4 OR, RR, confidence intervals were calculated in accordance with Cochrane Handbook for Systematic Reviews of Interventions Statistical heterogeneity was assessed with I ² statistic (>50% indicating substantial heterogeneity) Funnel plot used to assess for publication bias |

| Results |
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| Study participants: Primary outcome (Mortality): 15, 754 patients in 2 RCTs and 10 cohort studies Duration of hospital stay: 2,732 patients in 6 cohort studies Period of viral shedding: 151 patients in 2 cohort studies |
| Brief answers to research questions [key findings]: Mortality: steroids <i>increased</i> mortality (OR 1.94, 95% CI 1.11-3.4) Subgroup of “mild ill”: 6852 patients, OR 1.21 (0.72-2.03) → steroids did not reduce mortality Subgroup of “critically ill”: 8630 patients, OR 1.76 (0.85-3.65) → steroids did not reduce mortality |

Subgroup “low dose” steroids (methylprednisolone equivalent <40mg/day): 8853 patients, OR 2.23 (0.52-9.59) → steroids did not reduce mortality

Subgroup “high dose” steroids (methylprednisolone equivalent >50mg/day): 6878 patients, OR 1.67 (0.71-3.89) → steroids did not reduce mortality

Additional findings:

Duration of hospital stay: steroids *increased* hospital stay (WMD 1.18 days, 95% CI -1.28-3.64)

Period of viral shedding: steroids *increased* the duration of viral shedding (MD 1.42 days, 95% CI -0.52-3.37)

Limitations:

Heterogeneity among studies on mortality (I^2 96) and length of hospital stay (I^2 93) was high

Low quality evidence grade

Studies were mostly pre-print, no peer reviewed

No standardized treatment regimen – they were all over the place in the various studies

Clinical Implications

Applicable? yes

Feasible? yes

Clinically relevant? yes

Comments: basically just poor data thus far but as of now, looks like evidence not there to give steroids for COVID (no evidence of benefit and potentially even harmful)

Level of evidence generated from this study

Ia: evidence obtained from meta-analysis of randomized controlled trials

Ib: evidence obtained from at least one randomized controlled trial

IIa: evidence obtained from at least one well-designed, controlled study without randomization

IIb: evidence obtained from at least one other type of well-designed quasi-experimental study

III: evidence obtained from a well-designed, non-experimental study

IV: expert committee reports; expert opinion; case study; case report

Additional Comments/Discussion/Notes

Of note, steroids found to be associated with increased risk of death, increased ICU stay, and increased risk of secondary infections in influenza pneumonia

One study (Lu et al.) reported organ dysfunction more common in critically ill with steroids, and each 10mg

dose increase was associated with additional 4% mortality
Lots of different steroid regimens used, not compared to each other