A Seattle Intensivist’s One-pager on COVID-19

Nomenclature

Infection: Coronavirus Disease 2019 a.k.a. COVID-19
Virus: SARS-CoV-2, 2019 Novel Coronavirus
NOT “Wuhan Virus”

Biology

- 30 kbp, +ssRNA, enveloped coronavirus
- Likely zoonotic infection: source/reservoir unclear (Bats? Panigolins? → people)
- Now spread primarily person to person;
  - Can be spread by asymptomatic carriers!
- Viral particles enter into lungs via droplets
- Viral S spike binds to ACE2 on type two pneumocytes
- Effect of ACE/ARB is unclear; not recommended to change medications at this time.
- Other routes of infection (contact, enteric) possible

Timeline:

- China notifies WHO 2019-12-31
- First US case in Seattle 2020-1-15
- WHO Declared pandemic 2020-3-11
- National emergency 2020-3-12

Disease clusters: SNFs, Conferences, other Strategies: contact tracing, screening, social distancing

Epidemiology

- Attack rate = 30-40%
- R0 = 2-4
- Case fatality rate (CFR) = 3.4% (worldwide numbers)
- Incubation time = 4-14 days (up to 15 days)
- Viral shedding – median 20 days (max 37 days)

Diagnostic/Presevation

Symptoms

- 65-80% cough
- 45% febrile on presentation (85% febrile during illness)
- 20-40% dyspnea
- 15% URI symptoms
- 10% GI symptoms

Labs

- CBC: Leukopenia & lymphopenia (80%+)
- BMP: ↑BUN/Cr
- LFTs: ↑AST/ALT/Tibili
- ↑D-dimer, ↑CRP, ↑LDH
- ↑IL-6, ↑Ferritin
- ↓Procalcitonin
  *PCT may be high w/ superinfxn (rare)*

Imaging

- CXR: hazy bilateral, peripheral opacities
- CT: ground glass opacities (GGO), crazy paving, consolidation, *rarely may be unilateral*

Other Labs

- POCUS: numerous B-lines, pleural line thickening, consolidations w/ air bronchograms
- Labs:
  - BMP
  - AST/ALT/TP/bili: ↑
  - DBili/TBili: ↓
  - WBC/CXR: ↑
  - Hb/Hct: ↓
  - Glu:
  - LFTs: ↑
  - Cr: ↑
  - K: ↓
  - Na: ↓
  - Phos, ALK, Cl:
  - Creat:
  - Ferritin:

Prognosis

- Age and comorbidities (DM, COPD, CVD) are significant predictors of poor clinical outcome; admission SOFA score also predicts mortality.
- Lab findings also predict mortality

Precautions

- In correct sequence: STANDARD + CONTACT (double glove) + either AIRBORNE (for aerosolizing procedures: intubation, extubation, NIPPV, suctioning, etc) or DROPLET (for everything else)
  - N95 masks must be fit tested; wear eye protection
  - PPE should be donned/doffed with trained observer
  - Hand hygiene: 20+ seconds w/ soap/water or alcohol containing hand gel

Treatment

- Isolate & send PCR test early (may take days to result)
- GOC discussion / triage
- Notify DOH, CDC, etc
- Fluid sparing resuscitation
- ± empiric antibiotics
- Intubate early under controlled conditions if possible
- Avoid HFNC or NIPPV (aerosolizes virus) unless individualized reasons exist (e.g. COPD, DNI status, etc); consider helmet mask interface (if available) if using NIPPV
- Mechanical ventilation for ARDS

- LPV per ARDSnet protocol
- 7 P’s for good care of ARDS patients: e.g. PEEP/Paralytics/Proning/inhaled Prostacyclins, etc
- ? High PEEP ladder may be better
- ? ECMO in select cases (unclear who)
- Consider using POCUS to monitor/evaluate lungs
- Investigational therapies:
  - Remdesivir
  - Chloroquine
  - Lopinavir/ritonavir
  - Tocilizumab
  - Corticosteroids

- None of these investigational therapies is proven, but literature is evolving quickly.

# FlattenTheCurve - same AUC but distributed over a longer time, ensuring that hospitals don’t exceed capacity

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