Role of Vitamin-D in Reducing Need for Supplemental Oxygen Among COVID-19 Patients

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Objectives

- Explore the role of Vitamin-D and its implications on clinical trajectory of Covid-19 patients
- Increase awareness among healthcare professionals so that appropriate preventive and treatment actions can be taken

Background

- Vitamin-D is well documented for its anti-inflammatory role as an adjuvant in regulation of cytokines and immune cells[1]
- Research trials[2,3] on impact of Vitamin-D on clinical outcomes for COVID-19 infection are still in nascent stages[4]

Study Aims – impact on need for oxygen

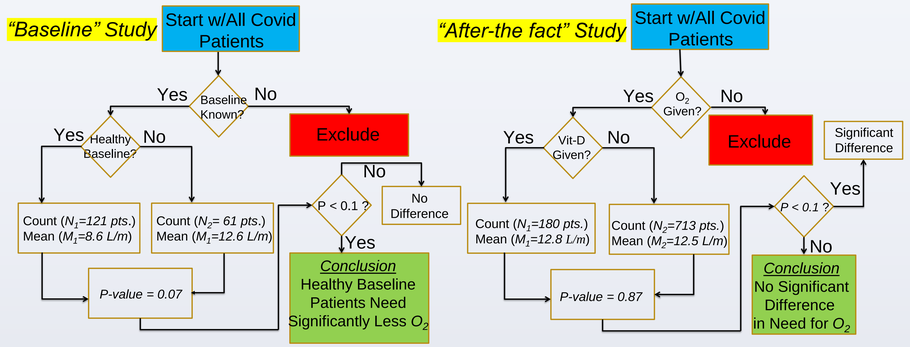
- Primary Aim:
  - Baseline Study: Determine whether having healthy level of *baseline* Vitamin-D 25-OH *(≥ 30ng/ml)* helps improve the clinical trajectory of Covid-19 patients in terms of need for supplemental oxygen.
- Secondary Aim:
  - After-the-fact study*:* Determine whether administering Vitamin-D *after-the-fact* for hospitalized Covid-19 patients reduces the need for supplemental oxygen.

Study Design

Item	Overall Description	Values
Study Type	Retrospective, Observational, Cohort	---
Location	RUHS Medical Center, Moreno Valley	Hospital
Duration	March – December 2020	*10* months
Dependent Variable	Peak O_2 needed	Real number
Variable Type	Quantitative (positive real no.)	*> 0 L/min.*

Item	Baseline Study	After-the-fact Study
Independent Variable	Baseline Vitamin-D level	Inpatient Administration of Vit-D
Variable Type	Categorical *≥ 30 ng/ml* (yes/no)	Categorical (yes/no)
Inclusion Criteria	All COVID-19 patients needing O_2 AND whose baseline Vit-D level is known (*N=182* patients)	All COVID-19 patients needing O_2 (*N=893* patients)

Analysis Flowcharts



Results/Findings

- Baseline Study: Mean values for *peak* oxygen flow rate for the group with healthy baseline level of Vitamin-D was *8.6 L/min* vs. *12.6L/min* for those with low or borderline levels, yielding a *p-value* of *0.07* (*p < 0.10*)
- After-the-fact Study: Mean values for *peak* oxygen flow rate for those not administered Vitamin-D was *12.5 L/min* vs. *12.8L/min* for those given Vitamin-D, yielding a *p-value* of *0.87* (*p > 0.10*)
- Given large sample sizes, the calculated statistical *power* for both our studies exceeded the customary norm of *80%* or better (*β < 0.2*)

Conclusions

- We found that patients with healthy levels of Vitamin-D at *baseline* needed significantly lower levels of supplemental oxygen.
  - This is consistent with published research[5-8] promoting adequate baseline Vitamin-D among the population as a potential benefit in context of COVID-19.
- Interestingly, we found no statistically significant advantage for administering Vitamin-D in the hospital, *after-the fact*.
  - This may be a case of "too little too late"
  - Caveat - it's possible that any delayed marginal benefits from *after-the-fact* Vitamin D may not have materialized promptly in the presence of significant inflammatory condition and larger influence of steroids and other EUA medicines.
  - Published research[5,6] indicates that since there is "low risk", providers should still consider inpatient Vitamin-D for potential benefits until more definitive findings are established.

References

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