



## CORRELATION OF VITAMIN D IN COVID 19 PATIENTS IN ASSESSING THE SEVERITY A RETROSPECTIVE OBSERVATIONAL STUDY.

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**ABSTRACT** **Background:** Covid19 disease caused by SARCS coV2 has an impact on morbidity and mortality on general population . effect of vitamin D on disease progression has to be studied **Materials and methods :** it is a retrospective observational study done in state covid tertiary centre between 15 th april 2021 to 30 th may 2021 in covid RTPCR positive patients **Results :** A total of 150 RTPCR positive patients were considered for the study. Of these 34 were mild , 57 were moderate, 59 were categorized under severe stage of disease. Of these 150 ,39 patients had sufficient vitamin D levels, 48 had insufficient levels, 53 had deficient vitamin D levels **Discussion :** IN the pathogenesis of covid 19 disease, there is hyperresponsive immunomodulatory phase which leads to cytokine storm leading to poor outcome of the patient. Vitamin D has a key role in halting the respiratory infections, immunomodulatory effects and thrombotic alterations done by COVID 19 disease .there are several studies which showed normal levels of vitamin D in COVID 19 patients with good impact on the outcome and prognosis of the patients .**Conclusion:** Sufficient vitamin D levels in COVID 19 patients have good recovery ,and less chances of progression to severe stage of disease.

**KEYWORDS :** COVID 19, vitamin D, Autoimmunity, Immunomodulation

### Introduction:

COVID-19 is a disease caused by SARS CoV 2 Which started its effect on humans from 2020 December with varied presentation clinically and diagnostically. For assessing the severity of COVID-19 disease different parameters evolved from beginning of pandemic. These laboratory and radiological investigations help in assessing the severity and prognosis of the disease, one such marker is vitamin D. Even though it is a hormone it has a key role in assessing the severity of COVID19 disease during the pandemic. It has an impact on reducing inflammation in the body .

In the COVID-19 disease the severity can be assessed by one of the components, whether the patient is having pneumonia or not is which is due to severe inflammation produced by COVID-19 2.vitamin D regulates the growth and differentiation of different cells in the body which help in immune mediated mechanisms 3 mainly in the innate and adaptive pathways of the immune system 4 .

### Materials and methods:

This study was done in patients admitted with SARC COV2 Infection in one of the tertiary care centers that is government General Hospital vijayawada from a period of April 15 2021 to May 30 2021. It is a retrospective study done in 150 patients.

COVID-19 confirmation was done by RT PCR positivity on nasal swab during hospitalization.

Laboratory parameters 25 OHD was assessed using standard assessment methods.

Vitamin D levels were classified as sufficient, insufficient, deficient, severely deficient by Endocrine society guidelines<sup>5</sup>.

### Inclusion criteria:

1. All COVID RTPCR positive patients.
2. Age greater than 18 years.

### Exclusion criteria:

1. COVID RTPCR negative patients.
2. Age less than 18 years.

### Results:

Out of the total 150 patients 78 were males and 72 female. Severity of

COVID-19 was assessed mainly on the saturations of the patient at the time of admission with 94% and above as mild stage, 94 to 92 as moderate disease, less than 92% as severe stage of disease.

Based on the parameters P value was calculated and shown as less than 0.05 which is statistically significant.

Saturations	Sufficient	Insufficient	Deficient
Mild	20	05	09
Moderate	11	21	25
Severe	08	22	29

A total of 150 RTPCR positive patients were considered for the study. Of them 34 mild, 57 moderate and 59 belonged to severe stage of the disease Out of 150 patients 39 of the patients had sufficient vitamin D levels, 48 had insufficient vitamin D levels, 63 had Deficient vitamin D levels.

Patients with sufficient levels of vitamin D having mild disease(20) were compared to moderate(11) and severe(8) stages of disease. 22 Patients with severe stage of disease had insufficient levels of vitamin D compared mild and moderate stages of disease with 21 and 5 patients respectively. Patients with deficient levels of vitamin D had severe stage of the disease that is 29 patients when compared to moderate and mild stage of disease having 25, 9 patients respectively.

### Discussion:

In Covid19 disease due to increased inflammatory response, there is development of pneumonia which leads to poor outcome of the patient. This inflammatory response can be regulated by vitamin D levels.

Previous studies showed that vitamin D has role in regulation of growth and differentiation of different immune celltypes<sup>6</sup>.

The association between vitamin D and increased chances of getting autoimmune diseases has been established by various reports<sup>7</sup>.

Vitamin D has key role in halting the respiratory infections as low levels have been seen in patients with pneumonia, viral upper respiratory tract infection<sup>8</sup>.

Vitamin D deficiency is seen in 30 to 60% of population of European countries, 50 to 80% of Asian countries<sup>9</sup>.

In some studies there is inverse relation between vitamin D and TMF alpha and also showed the increase in IL-6 levels in individuals with deficiency of vitamin D levels<sup>10</sup>.

These studies showed that sufficient levels of vitamin D may reduce inflammation mediated Hyper responsiveness on the levels of cytokines in the body leading to reduction in chances of developing cytokine storm which can occur in covid 19.

In addition to control of inflammatory pathways vitamin D levels can have effect on regulating thrombotic pathways<sup>11</sup>, hence chances of developing thrombotic episodes in Covid19 are high in individuals of deficient vitamin D levels.

Vitamin D deficiency associated with SARS COV2 can result high risk of getting the disease, chances of developing severe stage of disease, sometimes bad outcomes seen<sup>12</sup>.

Results of some studies showed that greater prevalence of vitamin D deficiency in patients requiring ICU care than in those without ICU care treatment, similar studies also showed deficiency of vitamin D in 67% of patients with mild SARS COV2, compared to 80% of patients requiring mechanical ventilation<sup>13</sup>.

In our study also, majority of patients with sufficient levels of vitamin D are having mild stage of disease, and patients with severe stage of disease have deficient vitamin D levels.

In continuation of immuno modulatory antiviral effects of vitamin D there is remake of renin angiotensin system which effects the pathogenesis of COVID 19.<sup>14</sup>

As sufficient levels of vitamin D will suppress renin at transcription level leading to increased angiotensin expression, restoring the physiological concentrate of ACE to downregulation by virus<sup>15</sup>.

Even though vitamin D has many functions, currently hypovitaminosis D hypothesized to be the consequence of chronic inflammatory disease and in current date there is no sufficient data to demonstrate definite role of vitamin D in modulation of adaptive immune system.

### Conclusion:

Vitamin D, although a hormone, has impact on regulating the inflammatory response of the body in addition to regulating the immunomodulatory action which are the key pathogenic factors of Covid19 disease and sufficient levels of vitamin D in the body can reduce the progression of disease into severe stage and need higher sample size and more data to confirm it.

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