**PATHOGENESIS OF CORONA VIRUS & ROLE OF IMMUNE** SYSTEM T CELLS & **HOW TO INCREASE YOUR IMMUNITY (T CELLS)** (REVIEW ARTICLES)

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NATURAL WAYS TO IMPROVE MELATONIN SECRETION

#### INTRODUCTION

#### COVID 19

- Global Public Health concerns and Global Emerging emergency.
- A super-hot spreading viruses spread from one to many people.

# COVID-19

COVID-19 is an infectious disease caused by SARS-CoV-2, a new type of coronavirus detected in China in late 2019.



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# PATHOGENESIS OF COVID 19

- Higher Leukocyte numbers. (70% Neutrophils)
- Increased levels of pro inflammatory cytokines
- Main Respiratory system: severe pneumonia
- Primary T cell responsibility Depletion of both CD 4 and
  CD 8 T cells leads to delayed viral clearance—-Immune
  mediated pneumonitis and reduces antibodies neutralising
  titters in the lung.

- CD 8 : peaked on seventh day of post infections and effective specific immune dominant episode
- Plays critical role in viral clearance & CD4 T cells provides necessary help for CD8 in clearance of Viruses.
- Memory T cell response : 90-95% Virus- specific T cells undergoing apoptosis-Contraction phase.
- Followed Memory Phase : T cells maintained for a prolonged period of time. Potential role for virus specific memory T cells in broad and long term protection
- So stronger virus- specific T cell response required

# WHAT IS IMMUNE SYSTEM ?

- Network of cells, tissues and organs that combined together fight for defensive role against to any foreign body.
- If crippled leads to torrent of diseases like HIV Allergy and Arthritis.
- The secret to success is an extensive and delicate communication network.
- Once it receive alarm produce powerful chemicals.

## ANTIGEN CARRY MARKER



#### **STRUCTURE OF IMMUNE SYSTEM**



## T CELL ROLE

- T cells do not recognise free floating antigens unlike B cells.
- T cells : immune defences in two ways

(a) Some Direct & regulate immune responses(b)Others directly attack infected cells

## T CELLS & KILLER CELLS



#### **MOUNTING IMMUNE RESPONSE**



#### PINEAL GLAND

 It is an independent endocrine gland secrets serotonin and melatonin hormones.

Melatonin secrets between 11pm to 4pm.

## **ROLE OF MELATONIN**

- Affects a variety of physiological process including circadian rhythms, cellular function, controls Beta cell function and immune function.
- Importantly melatonin significantly influences T cell- mediated immune responses which are crucial to infections and cancers.
- Melatonin highly effective in modulation of T cell activation and differentiations especially for Th 17, Treg cell and also memory T cells.

#### **SUMMARY OF MELATONIN ROLE**

Signalling T cells fate determination

T cell based immunopathogenesis

# NATURAL WAYS TO IMPROVE MELATONIN SECRETION

Avoid looking at your phone at night – All electronics like laptop and smart phones emits blue lights, this can wake you up and sends signal through retina to the brain which shut downs melatonin releas



- Get some sun in the morning This is because the sunlight aids in the production of seratonin, which is the precursor of melatonin.
- Especially in the early morning our nocturnal melatonin production occur earlier in the evening and help us to sleep more easily.



Keep your bedroom dark - This helps to
promote a sense of relaxation as our body and
mind prepare to sleep. Darkness triggers the
body to secrete melatonin.



- Take melatonin supplements Taking
  melatonin supplements 4 hours before bed
  will cause levels to spike in our body and then
  decline.
- Our body will recognize the decline , so the pineal gland will start to produce more melatonin.



- Eat melatonin rich food Try eating several hours before bed to boost melatonin release at later night.
- Fruits and vegetables like, Banana, tomato,
  corn, pomegranate, orange, Nuts and seeds
  such as walnuts & flax; Grains like barley and
  rolled oats ect., naturally contains melatonin.



Try corpse pose – Also known as Savasana:
This yoga pose is dubbed corpse pose because
we lye sill and flat on the back, focussing only
the breathe, this is also related with higher
melatonin level, therefore helps to sleep.



Take a warm bath – Taking warm bath or shower at night can help lower the stress hormone cortisol, which encourages the production of melatonin.



Cut of caffeine drink water instead – Studies
 have proved caffeine interferes with melatonin
 secretion, it may delay or reduce the quality of
 sleep.





- Meditate The brain responds to calm and quiet mind in the evening hours by releasing melatonin.
- Meditation reduces anxiety, relax muscles and
   lower nervous system arousal, which helps to
   promote melatonin release.



 Start an exercise routine – The hormones and neurotransmitters that are released during exercise supports melatonin synthesis.



- Wear Amber tinted glasses: If you have to check mails at might or look at your phone you can use Amber – tinted glasses.
- These glasses blocks the blue light produced by the electronic devices.



 Smell lavender – Smelling lavender oil 10 to 15 minutes before sleep enhances sleep quality and influence melatonin through nervous system.





 Adequate sleep of 8 hours without break and at a correct time also releases melatonin.



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