

## Editorial

### SPACE MEDICINE

#### Space, moon , mars or Jupiter: Lockdown alternatives in COVID 19 ERA

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Dr. Jayaprakash Muliylil, leading epidemiologist and Serving in ICMR tells that “eradicating COVID19 disease is over and the country should move towards developing ‘herd immunity. So ok, wait for herd immunity to develop. And great!! that Indian are immune to many bacteria and viruses .But U.S. President Donald Trump is not willing to wait for herd immunity to develop .The USA president Donald Trump signed an order that would enable the United States to mine the moon. The purpose was to mine minerals and water, and eventually set up a lunar colony. The Vice President Mike Pence further stressed the importance of the U.S. making the first stake for mining, stating: “NASA already knows that the lunar south pole holds great scientific, economic and strategic value, but now it’s time to commit to go there. So it will be the responsibility medical fraternity to prepare the society and manage health of dwellers of space or lunar colonies including astronauts travelling in space and moon, mars or Jupiter also .Fortunately India is already far ahead in space science and space medicine .This concept give us to write few words on space medicine to prepare medical fraternity to global response to corona and potential similar newer entities . First of all we all know that there is no atmosphere and water in space so Physicists, chemists ,biologists and allied technocrats have huge homework to prepare adequate oxygen, water, food and shelter by innovative way to provide to in dwellers of societies of moon .simultaneously medical fraternity has to find out innovative ways to prepare the clinics, surgery , anaesthesia , deliveries in space including probable pharmaceutical and surgical and biomedical instrumental manufacturing in space.

**Space medicine** is the practice of medicine on astronauts in space. Parallel branch astronautical hygiene is the application of science and technology to the prevention and control of exposure to the hazards and medical problems that may cause astronaut’ ill health. Historical point of view a physician and physiologist Hubertus Strughold , first coined the term "space medicine"(Father of space medicine) in 1948 and was the first Professor of Space Medicine at the School of Aviation Medicine (SAM) at Randolph Air Force Base, Texas. . So let us have some insight in space medicine. Before traveling into space the subjects are to be examined by physiologists for fitness both physical and mental. Mental health is very important because the space travel is like express highway and there is mostly no u tern so person must be mentally fit for taking decision to go and travel in space. Physical fitness is also equally important and medical expert should examine each and every system thoroughly. NASA’ research team has very interesting observation that immunity is significantly suppressed in space . All the parameters of T cells and B cells functions are suppressed and dormant organism present in the body may be become virulent in such environment even though the space is probably free from micro and macro organisms(Except aliens ). Another most common issues are related to gravity (Normal

Gravity one earth is G1). While ascending up the gravity G1 is increasing and while descending down vice versa. (Plus- G to minus- G). So while ascending the interstitial fluid is accumulated in upper body segment and during descending it is accumulated in lower segment of body .And similarly the blood pressure is fluctuating increased and decreased(with G plus to G minus) leading serious problems on the body especially eye and brain . Subjects have to significantly acclimatized to both extreme positive and negative gravity including lateral and transverse gravity including zero gravity on earth in artificial/ virtual environments. To achieve this adaptation, the extreme cardio vascular adaptability and fitness is required. In spite of such fitness, reversible or irreversible damage to brain or eye including premature aging & alzemers 'disease is possible amongst space travellers .Respiratory system is even more vulnerable than other systems . Respiratory problems include decompression sickness, barotrauma and intolerance to hypoxia and CO2 narcosis. Because of exposure to negative gravity there is profuse loss of bone and muscle mass (osteopenia and sarcopenia). There are additional issues to consider are backache, headache, fatigue, stress, accidents. The most health problem the space travellers are explored is radiation hazards as the is no atmosphere Large numbers of national and international associations, societies are doing lots of research on management, prevention, biomedical engineering & Instrumentation for comfort and safety of living in space. Medical council of India has already started a course on MD doctor of medicine in aero-Space medicine. We as a part of Fraternity of national research & publication society has planned a webinar on space medicine to improve our knowledge on space medicine in October 2020.Meanwhile don't forget take needful precaution to prevent corona i.e. social distances, use of appropriate masks and sanitisers.

References:1 [https://www.business-standard.com/article/current-affairs/we-cannot-run-away-to-the-moon-need-to-develop-herd-immunity-dr-muliyil-120040601232\\_1.html](https://www.business-standard.com/article/current-affairs/we-cannot-run-away-to-the-moon-need-to-develop-herd-immunity-dr-muliyil-120040601232_1.html) 2 <https://www.bloomberqint.com/global-economics/world-economy-that-took-elevator-down-faces-steep-stairs-back-up> 3 <https://www.aerosociety.com/get-involved/specialist-groups/safety/aerospace-medicine/> 4 [https://www.business-standard.com/article/news-ani/iaf-chief-inaugurates-three-days-annual-conference-of-the-indian-society-of-aerospace-medicine-119111401539\\_1.html](https://www.business-standard.com/article/news-ani/iaf-chief-inaugurates-three-days-annual-conference-of-the-indian-society-of-aerospace-medicine-119111401539_1.html) 5 <https://www.iaasm.org/> 6 <https://www.asma.org/news-events/events/1st-international-conference-in-aerospacemedicine#:~:text=ICAM%202020%20will%20be%20the,been%20postponed%20to%20September%202021.>