xInternational Journal of Medicine Research
ISSN: 2455-7404; Impact Factor: RJIF 5.42
Received: 12-12-2020; Accepted: 27-12-2020; Published: 16-01-2020
www.medicinesjournal.com
Volume 6; Issue 1; 2021; Page No. 13-14

Herd immunity against Covid 19: A hope towards normal life!

Vikrant Patil*, Sushama Patil
Director, The Ayurvedic Thyroid Clinic (TATC), Mohan Nagar, Dhankawadi, Pune, Maharashtra, India

Abstract
Immune response to the infection is double edged sword, under expression as well as over expression of immune response is lethal. Over activation of immunity and inflammation can cause a lung injury thus can be correlated to severity of COVID 19. Acquired immunity is a result of natural infection or through immunization with a vaccine. Immunity within a population possess down or halt the infection. It refers to the herd immunity. The re-exposure to the individuals to virus will produce more robust antibody response over period of time. The herd immunity is seeming very destructive, but is very robust response that a community will develop against COVID 19 eventually through socialization of infected individuals and immunization. The robust immune response would get developed to reinfection and memory immunity. Herd immunity is light after a long tunnel and can help nations to operate to the normalcy of functioning.

Keywords: herd immunity, T-cells, NK cells

Introduction
Coronaviruses are underlying pathogenic factors for Severe Acute Respiratory Syndrome (SARS) and COVID-19. As per Prevalence report of WHO on 15 October 2020, there are 38,002,699 confirmed cases of COVID-19, including 1,083,234 deaths globally [1].
Recent research data for COVID-19 suggests that the causative virus (SARS-CoV-2) has a closely related to bat-origin SARS-like coronavirus. It is belonging to beta coronavirus related to the Severe Acute Respiratory Syndrome (SARS) virus which is enveloped RNA, and the virus has been shown to use the angiotensin-converting enzyme 2 (ACE2) receptor for cell entry. Primary source of transmission is corona infected person. Direct person-to-person transmission occurs via respiratory droplets through coughing, sneezing of an infected person. These droplets contaminate surfaces, and viable viruses get entry through eyes, nose, or mouth to the person who touches the contaminated surfaces. The mean incubation period is 5.1 days (range 2–14 days). During 2-14 days COVID-19 is infection presentation is uncertain. Current research evidences shown that, infection period starts 2 days prior to onset of symptoms and remain for up to 8 days. Asymptomatic role of infections in transmission still remain under investigation [2].

Role of Immunity in COVID-19
It is evident from earlier researches that severity of COVID 19 is linked to either insufficient or excessive T cell responses. The absolute counts of CD3+ /CD4+ /CD45+ - lymphocytes were lower among patients with COVID-19 compared to healthy subjects adjusted for age and gender [3, 4]. CD3+ T cells are mainly composed of CD4+ T cells and CD8+ T cells which in turn have crucial role in adaptive immune responses. There was a strong correlation between the severity of COVID-19 and the CD3+, CD4+ and CD8+ T lymphocytes. CD4+ are the helper cells which identify the infected cells and pathogen which is taken care by CD8+ T lymphocytes as killer cells [5].
Primary innate immune responders are natural killer cells playing a critical for viral load clearance and immunomodulation. Dampening of NK cell responses by coronaviruses can present a strong linkage and thus a good marker to evaluate the immunity. Decrease in number of circulating NK cell levels and exhaustion may be directly responsible for the progression and severity of COVID-19 [6, 7].
B cells (B lymphocytes) in the blood are involved in early effector responses via the production of protective antibodies, as well as in initiating the production of memory cells [8, 9].
Immune response to the infection is double edged sword, under expression as well as over expression of immune response is lethal. Over activation of immunity and inflammation can cause a lung injury thus can be correlated to severity of COVID 19.

Herd immunity and COVID-19
Acquired immunity is a result of natural infection or through immunization with a vaccine. Immunity within a population possess potential to slow down or halt the infection. It will be possibility of indirect protection of community when large number of population is immune by its own by susceptible to infection. This could be also helpful in context of This population-level effect is often considered in the context of vaccination programs, which aim to establish herd immunity so that those who unvaccinated, including the younger population and elder population and population with impaired immune response, are still protected against disease. As result of current scenario of existing immunity towards infection can be come with result of different outcome for infected individuals. In a completely unaffected population, a pathogen will develop through susceptible hosts in an unchecked manner following effective exposure of susceptible hosts to infected individuals. However, if a definite proportion of community has immunity towards same infection, so the possibility of contact between infected and susceptible hosts is reduced, since many hosts are immune and, therefore, cannot transmit the pathogen. If the

adequate number of susceptible individuals in a population not sufficient, then spread of infection will reduced and lead to drop in prevalence rate. The point at which the number of susceptible individual's level reduces the number needed for transmission is known as the herd immunity threshold [10].

It must be noted that in case of the yearly flu shot, even though some people have less risk, they are move to take the shot to goal and preserve herd immunity so that the risk of spread is minimized [11, 12]. Once a community has established herd immunity against COVID-19, someone without immunity is less likely to be exposed to an infectious individual during an outbreak. For example, because there are greater number of community having immunity to fight against covid-19, there are fewer people susceptible infection, and thus the frequency of transmissions is halt. Similarly, those who are immune will less likely to be infected with COVID-19 again, and thus will not transmit the disease to others. In case of these possibilities will helpful in control to outbreak.

Possible Mechanism of getting herd immunity

Most people who are infected with the COVID-19 virus produce antibodies, protecting host cells from infection. Body's immune response against COVID 19 can get developed out of fine interplay between T cells response and memory B cells antibody response to SARS Cov 2 virus.

Many of the current research state that the COVID-19 antibody levels decline and remained for two to three months after infection. The re-exposure to the individuals to virus will produce more robust antibody response over period of time that will create significant B and T cell response to protect body from getting re-infected for longer duration of time. These findings spot light on body immune system action against re-infection with COVID-19 virus.

The patients experienced mild symptoms during his first infection and had no symptoms the second time got infected. It's possible that immune system could not protect individual against reinfection, it did help keep individual from getting sicker during the second infection [13].

Conclusions

Though the herd immunity seems to be very destructive, but is very robust response that a community will develop against COVID 19 eventually through socialization of infected individuals and immunization. The robust immune response would get developed to infected individuals through repeated exposure and memory immunity. Herd immunity is light after a long tunnel and can help nations to operate to the normalcy of functioning.

References

1. World Health Organization. Middle East respiratory syndrome coronavirus (MERS-CoV), 2019. https:// www.who.int/emergencies/mers-cov/en.
2. Grant MC, Geoghegan L, Arbyn M, Mohammed Z, McGuinness L, Clarke EL *et al*. The Prevalence of Symptoms in 24,410 Adults Infected by the Novel Coronavirus (SARS-CoV-2; COVID-19): A Systematic Review and Meta-Analysis of 148 Studies from 9 Countries. Available at SSRN 3582819, 2020.
3. Giamarellos-Bourboulis EJ, Netea MG, Rovina N, Akinosoglou K, Antoniadou A, Antonakos N *et al*. Complex immune dysregulation in COVID-19 patients with severe respiratory failure. Cell host & microbe, 2020.
4. Liu R, Wang Y, Li J, Han H, Xia Z, Liu F *et al.* Decreased T cell populations contribute to the increased severity of COVID-19. Clinica Chimica Acta, 2020. https://dx.doi.org/10.1016%2Fj.cca.2020.05.019
5. Cao X. COVID-19: immunopathology and its implications for therapy. Nature reviews immunology. 2020; 20(5):269-70.
6. Market M, Angka L, Martel AB, Bastin D, Olanubi O, Tennakoon G *et al.* Flattening the COVID-19 curve with natural killer cell based immunotherapies. Frontiers in Immunology, 2020, 11. https://doi.org/10.3389/fimmu.2020.01512
7. Brandstadter JD, Yang Y. Natural killer cell responses to viral infection. Journal of innate immunity. 2011; 3(3):274-9. http://dx.doi.org/10.1159%2F000324176
8. Dr. Liji Thomas. COVID-19 progression linked to B cell activation, News Medical Life Science, on May 04 2020, Available from: https://www.news-medical.net/news/20200504/COVID-19-progression-linked-to-B-cell-activation.aspx
9. He R, Lu Z, Zhang L, Fan T, Xiong R, Shen X *et al.* The clinical course and its correlated immune status in COVID-19 pneumonia. Journal of Clinical Virology, 2020, 104361. https://dx.doi.org/10.1016%2Fj.jcv.2020.104361
10. Randolph HE, Barreiro LB. Herd Immunity: Understanding COVID-19. Immunity. 2020; 52(5):737-41.https://swachhindia.ndtv.com/explainer-what-is-herd-immunity-and-can-it-control-the-coronavirus-pandemic-43756/
11. Rakesha Ramaswamy. Is herd immunity even a viable strategy for COVID-19?, 2020. Available from: https://www.thehindu.com/thread/science-health-environment/
12. https://www.health.harvard.edu/diseases-and-conditions/preventing-the-spread-of-the- coronavirus