INCIDENCE OF COVID-19 INFECTION FOLLOWING IMMUNIZATION AMONG 2ND-YEAR MBBS STUDENTS

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ABSTRACT

Objectives: India began the administration of two COVID-19 vaccines i.e., Covishield and Covaxin on 16 January 2021 after getting approval for emergency use but several cases of vaccinated people, even those who have received both doses, tested positive for the virus referring to as ―breakthrough‖ infections. This study was to assess the incidence of COVID-19 infection following immunization among 2nd-year MBBS students in Ganesh Shankar Vidyarthi Memorial (GSVM) medical college, Kanpur during the 2nd wave of the corona pandemic. **Materials and Methods**: Our study was a prospective, cross-sectional study conducted on second professional MBBS students. The authors administered a self-structured questionnaire to the students. The data obtained were tabulated, analyzed and the results calculated in percentages. **Results:** Among total 241 respondent students, 184 (76.35%) students were vaccinated. Among vaccinated, 92.93% were vaccinated with covishield and 7.07% with covaxin. Among them, 13 students tested COVID-19 positive documenting a post-vaccination infection rate of 7.06%. Among positive students, 30.77% (4) received their single shots only. The most common signs and symptoms noticed were fever (84.6%) followed by cough (61.5%) and loss of taste and smell (61.5%) followed by body ache (46.2%), sore throat (46.2%), breathlessness (15.4%), malaise (7.7%). Co-morbidity reported as asthma in only 1 whose high-resolution CT-scan score was between 5-10 but 100% opted for home isolation due to non-serious symptoms and the most common pharmacological treatment taken were paracetamol (84.6%) followed by azithromycin (69.23%) and vitamin C-Zinc (69.23%) followed by dexamethasone (7.7%) and ivermectin (7.7%) with a slight change in SPO2 but >95% in 4 (30.8%) students followed by 1 (7.7%) between 90-95%. **Conclusion**: Our study assessed all 13 vaccinated students, tested positive for COVID-19, and concluded non-serious symptoms with full recovery on home-based treatment mostly within 7-14 days. So, vaccination is a better choice to opt-in long run depicting ―precaution is better than cure‖ is of utmost importance with a distance of two yards and masks are a must.

KEYWORDS: COVID-19, Vaccinated students, Covishield and Covaxin, Recovery, Questionnaire.

INTRODUCTION

Coronaviruses (CoV) are a large family of viruses that cause illnesses ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans. The year 2020 will be remembered in modern history as the most challenging year in terms to combat SARS CoV-2, the coronavirus responsible for COVID-19 is an RNA virus, and these viruses generally have a high mutation rate.

Genetic instability has long been considered to represent a challenge to develop effective vaccines against RNA viruses. The public and private sectors have united together to develop effective and safe vaccines. By January 2021, emergency approval was granted to nine vaccines by regulatory authorities in different parts of the globe.[1] Two vaccines got approval for emergency use in India, i.e., Covishield (a brand of the Oxford–AstraZeneca vaccine manufactured by the Serum Institute of India) and Covaxin (developed by Bharat Biotech). In April 2021, Sputnik V was approved as a third vaccine, with deployment expected to begin by late July 2021.

India began the administration of COVID-19 vaccines on 16 January 2021. As of 22nd June 2021, India has administered 29,33,70,338 total vaccination doses overall, including first and second doses of the currently approved vaccines.[2,3]

In the last few days, however, there have been several cases of vaccinated people, even those who have received both doses, testing positive for the virus. Such cases are referred to as "breakthrough" infections, implying that the infection has broken through the protection provided by the vaccine.

Therefore, there is the need to study the incidence and severity of covid infection after covid vaccination. So, we planned this study to know the incidence and severity of covid infection after vaccination among 2nd -year students during the 2nd wave of the corona pandemic.

MATERIAL METHOD
The present study was conducted among 2nd-year medical students of GSVM Medical College, Kanpur. It is a prospective, cross-sectional questionnaire-based online study carried among all the 2nd year medical students during the 2nd wave of the corona pandemic.

We prepared a self-structured questionnaire (35 Questions) with the help of a link. All the instructions regarding the link were given beforehand on how to open the link and had instructed to avoid biased answers.

The questionnaire consisted of questions regarding the status of COVID-19 vaccination and incidence of covid infection after vaccination along with signs and symptoms, type of investigation and treatment taken, etc. after that, all the data were analyzed in percentage via graphical presentation.

Total 30 mins were given and within 30 mins responses had to be submitted.

RESULT
In our study among 241 total respondents, 184 (76.35%) were vaccinated. Among total respondents 140 were male and 101 were female, out of which 121 males and 89 females belong to the 18-22 years age group whereas 19 males and 12 females belong to the 22-26 years age group. (Fig 1).
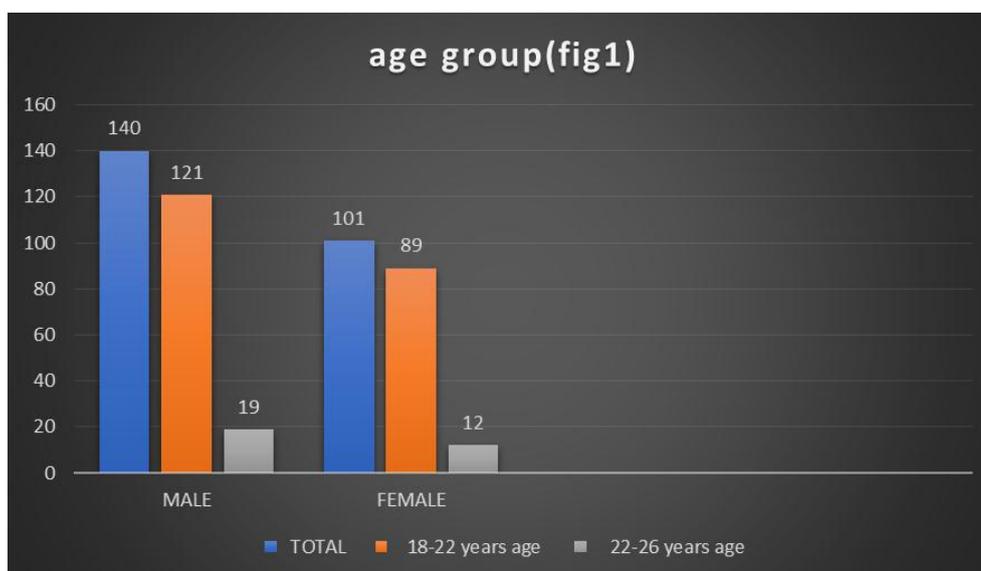

Also, in our study maximum number of students nearly 93.76% belong to Uttar Pradesh, and the rest 6.24% were from other states.

Among 184 total vaccinated students, 171 received covishield (single shot-71, double shot-100) and the rest 13 received covaxin (single shot- 8, double shot-5). (Fig 2)

Among vaccinated students, 13 were tested positive post-vaccination 8 students via the single method (RTPCR), and 5 by more than one among RTPCR, ANTIGEN KIT, and TRUNAAT. Among 13 positive candidates, 30.77% (4) were single-shot vaccinated and the rest 69.23% (9) received their double shots.

Signs and symptoms noticed were generally multiple among positive students which included fever along with sore throat, cough, and loss of taste and smell in 6 students whereas 2 students had fever along with cough and breathlessness and the rest 5 students reported only a single symptom among listed. (fig. 3)
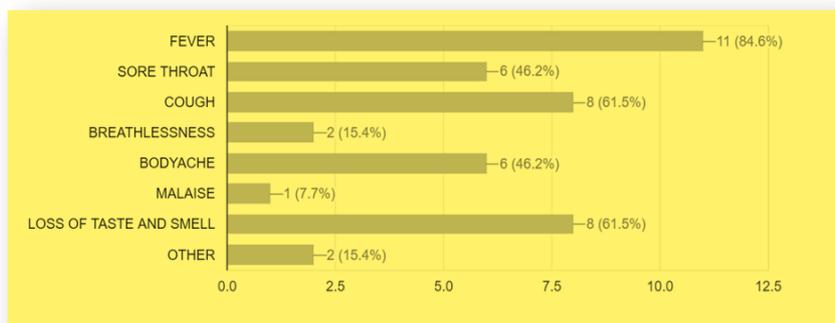
Among 13 covid-19 positive, only one student had co-morbidity reported as asthma but 100% opted for home isolation due to non-serious symptoms and fully recovered on home-based treatment.

Among our subjects, in 8 students no change in SPO_2 was noticed, in 4 students there was a slight change but > 95%, and in 1 student symptomatic with multiple symptoms had SPO_2 between 90-95%. (Fig 4)
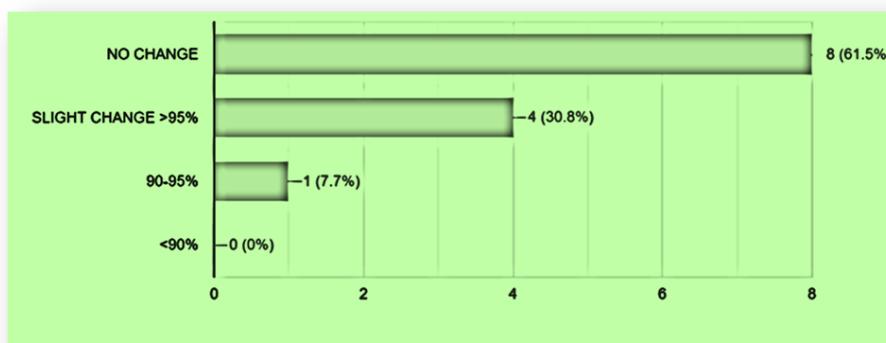

The total leucocyte count and other counts were found to be either normal or they didn't know about it. (Fig 5)
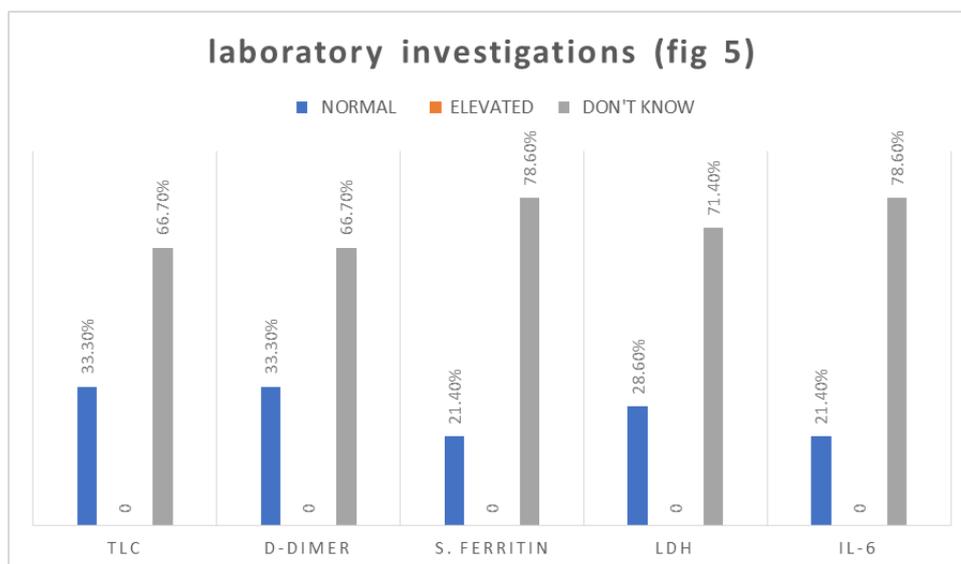
A High-resolution CT-scan score was done in only 1 student out of 13 positive students which came out to be between 5-10.

Pharmacological management given was home-based among all positive students which included tablets of

vitamin C-zinc, paracetamol, and azithromycin in 8 among 13 positives whereas 2 were only on paracetamol. 1 among 13 took dexamethasone who had previously going on medication for asthma. (fig. 6)
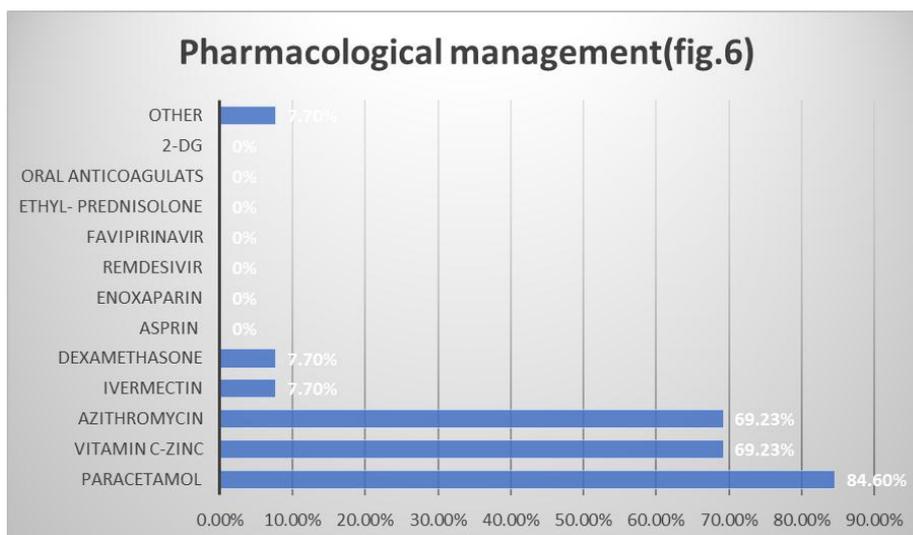
Non-pharmacological management includes steam inhalation opted by 100% along with it few also had hot water and saline gargle each making up to 84.16%, few incorporated kadha 61.5%, walking and deep breathing exercises 46.2%, and yoga (38.5%) in their daily routine. (fig7)
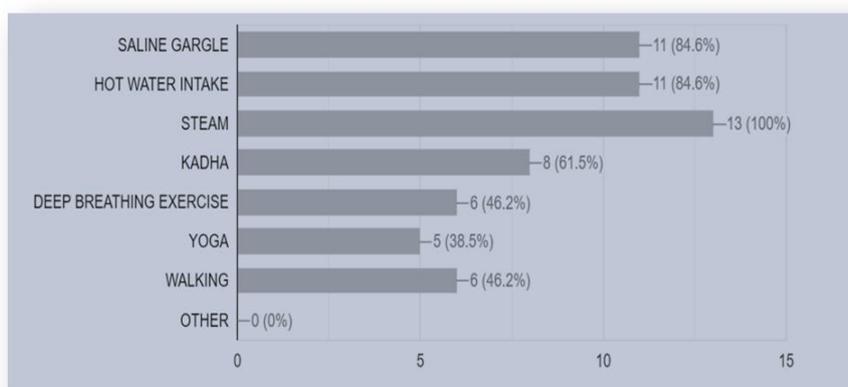
Out of 13 covid positive students, 2 students became Covid-19 negative in <7 days, 7 in 7-14 days, 3 in 15-21days, and only 1 became negative after >21 days. (Fig 8)
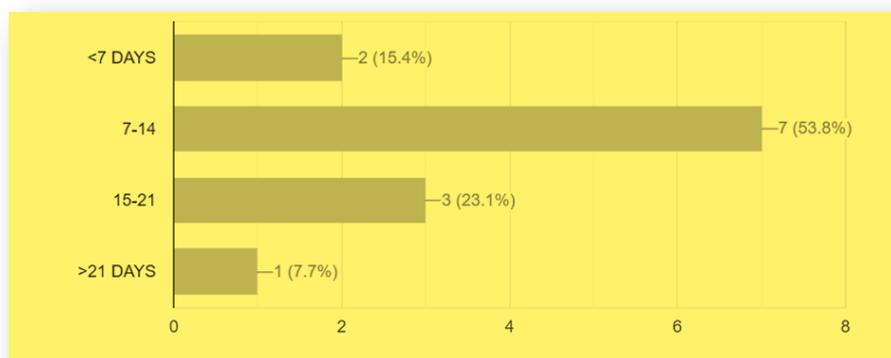
Post covid recovery symptoms reported were multiple among 8 students, the rest 5 reported only a single symptom. Reported symptoms included body ache (30.8%), weakness (38.5%), and joint pain (7.7%) but were non-serious and mild in intensity (Fig 9). With a 100% recovery rate.

Table 1: Possible reason for exposure due to laxity in precaution.

Exposure reason	Among Covid-19 Positive	Percentage
MASK	0	0
SANITIZATION	1	7.7%
BOTH ABOVE	3	23.1%
DON'T KNOW	8	61.5%
NONE	1	7.7%

Most of them were unaware of exposure place but out of 13 positive students 5 considered hostel/home followed by market and other workplace as origin of possible exposure. (Fig 10).
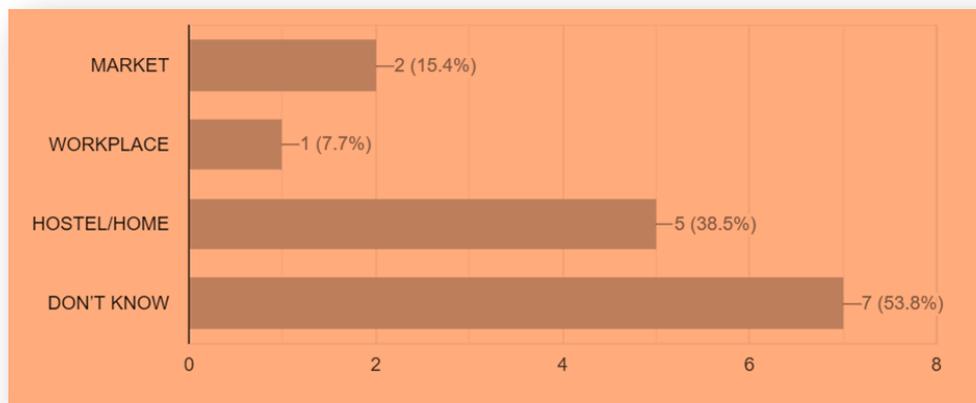
Table: 2 Exposed from.

RELATIVES	(5)38.5%
FRIENDS	(1)7.7%
PATIENTS	(0)
DON'T KNOW	(8)61.5%
OTHER	(1)7.7%

DISCUSSION
Though vaccines are supposed to protect individuals from getting infected none of the vaccines is 100% effective. Some may have been infected before the jab; also, some strains may evade vaccination protection. As in large, randomized controlled trials, each vaccine was found to be safe and efficacious in preventing symptomatic, laboratory-confirmed COVID-19 cases.[4–7]

Despite the high level of vaccine efficacy, a small percentage of even fully vaccinated (i.e., received both recommended doses of an FDA-authorized COVID-19 vaccine) will develop symptomatic or asymptomatic infections with SARS-CoV-2, the virus that causes COVID-19.[5–11]

In our study 241 students responded, among which maximum students belong to the 18-22 yrs age group. Out of total respondents 76.35% were vaccinated, among which 92.93% were vaccinated with covishield and 7.07% with covaxin. Among them, 13 students tested positive for COVID-19 mostly due to various exposure reason because of laxity in precaution that documented post-vaccination infection rate to be 7.06%, were tested

because they had symptoms most commonly an influenza-like illness that included fever, cough, body ache, myalgia, and sore throat.

Among 13 students, 30.77% (4) received their single shots only and all of them reported non-serious events post-infection which is following study conducted by Amit et.al[12] on post-vaccination covid infection among health care workers, according to which vaccine is not likely to exert protection against clinical disease during the first few days after receipt of the first dose or even early after the second dose.[13] Thus, during a large-scale immunization campaign coinciding with a rapid national increase in COVID-19 cases, some immunized persons likely will develop clinical disease.

In our study, all positive students had non-serious symptoms except one who is a known case of asthma. Lately, because of which he had breathlessness and had to go for his HRCT-scan done which followed complete medication including dexamethasone which is justified under the crucial findings from Peters and colleagues that support the recommendation in patients with asthma using Inhaled corticosteroids(ICS), this treatment should be continued since ICS are the cornerstone of asthma management, reducing exacerbations and asthma mortality, and are associated with decreased expression of ACE2, the receptor of SARS-CoV-2, in induced sputum.[14]

Among positives, most of them fully recovered within 7-14 days of treatment mainly with minimal basic medication among paracetamol, tab. Vitamin C-Zinc, azithromycin, etc. along with multiple non-pharmacological managements.

CONCLUSION
In our study among all vaccinated students, 13 students tested positive for COVID-19 concluding the infection rate to be 7.06% reported non-serious symptoms and recovered fully on home-based treatment mostly within 7-14 days. So, vaccination is a better choice to an opt-in long run for a scenario like the covid-19 pandemic. Here "precaution is better than cure" is of utmost importance with a distance of two yards and masks are a must.

ACKNOWLEDGEMENTS

REFERENCES
1. Craven J. RAPS: COVID-19 vaccine tracker. https://www.raps.org/news-and-articles/news-articles/2020/3/covid-19-vaccine-tracker (2021). Accessed 23 Jan 2021.
2. http://mohfw.gov.in/Vaccination Data from, "Ministry of Health and Family Welfare", available state-wise, on dated 2021 April 28
3. Data from www.moderngroup.in/ Vaccination Statistics, Retrieved 2021 March 21
4. Polack FP, Thomas SJ, Kitchin N, et al.; C4591001 Clinical Trial Group. Safety and efficacy of the BNT162b2 mRNA COVID-19 vaccine. N Engl J Med., 2020; 383: 2603–15. PMID:33301246 https://doi. org/10.1056/NEJMoa2034577
5. Baden LR, El Sahly HM, Essink B, et al.; COVE Study Group. Efficacy and safety of the mRNA-1273 SARS-CoV-2 vaccine. N Engl J Med., 2021; 384: 403–16. PMID:33378609 https://doi.org/10.1056/ NEJMoa2035389
6. Sadoff J, Gray G, Vandebosch A, et al.; ENSEMBLE Study Group. Safety and efficacy of single-dose Ad26.COV2. S vaccine against COVID-19. N Engl J Med., 2021; NEJMoa2101544. Epub April 21, 2021. PMID:33882225 https://doi.org/10.1056/NEJMoa2101544
7. Thompson MG, Burgess JL, Naleway AL, et al. Interim estimates of vaccine effectiveness of BNT162b2 and mRNA-1273 COVID-19 vaccines in preventing SARS-CoV-2 infection among health care personnel, first responders, and other essential and frontline workers— eight U.S. locations, December 2020–March 2021. MMWR Morb Mortal Wkly Rep., 2021; 70: 495–500. PMID:33793460 https://doi. org/10.15585/mmwr.mm7013e3
8. Tenforde MW, Olson SM, Self WH, et al.; IVY Network; HAIVEN Investigators. Effectiveness of Pfizer-BioNTech and Moderna vaccines against COVID-19 among hospitalized adults aged ≥65 years—United States, January–March 2021. MMWR Morb Mortal Wkly Rep., 2021; 70: 674–9. PMID:33956782 https://doi.org/10.15585/mmwr. mm7018e1
9. Tande AJ, Pollock BD, Shah ND, et al. Impact of the COVID-19 vaccine on asymptomatic infection among patients undergoing pre-procedural COVID-19 molecular screening. Clin Infect Dis., 2021; ciab229. Epub March 10, 2021. PMID:33704435 https://doi.org/10.1093/cid/ciab229
10. Swift MD, Breeher LE, Tande AJ, et al. Effectiveness of mRNA COVID-19 vaccines against SARS-CoV-2 infection in a cohort of healthcare personnel. Clin Infect Dis 2021; ciab361. Epub April 26, 2021. PMID:33900384 https://doi.org/10.1093/cid/ciab361
11. Haas EJ, Angulo FJ, McLaughlin JM, et al. Impact and effectiveness of mRNA BNT162b2 vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalizations, and deaths following a nationwide vaccination campaign in Israel: an observational study using national surveillance data. Lancet, 2021; 397: 1819–29. PMID:33964222 https:// doi.org/10.1016/S0140-6736(21)00947-8
12. Amit S, Beni S, Biber A, Grinberg A, Leshem E, Regev-Yochay G. Postvaccination COVID-19

among Healthcare Workers, Israel. Emerg Infect Dis., 2021; 27(4): 1220-1222. https://doi.org/10.3201/eid2704.210016

13. Polack FP, Thomas SJ, Kitchin N, Absalon J, Gurtman A, Lockhart S, et al.; C4591001 Clinical Trial Group. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. N Engl J Med., 2020; 383: 2603–15. DOIExternal LinkPub Med External Link

14. Maes, Tania et al. "COVID-19, Asthma, and Inhaled Corticosteroids: Another Beneficial Effect of Inhaled Corticosteroids?" *American journal of respiratory and critical care medicine*, 2020; 202,1: 8-10. doi:10.1164/rccm.202005-1651ED