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Research Paper

Correlation of Covid-19 Vaccination with References to Seasonal Viral Fever

Prakhar Bajpai, Javed Ali, Deepika Gupta*, Shubham Bhatt, Shikhar Verma

Maharishi School of Pharmaceutical Science, MUIT, Lucknow, Uttar Pradesh, India.

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ABSTRACT

Numerous studies have been conducted to better understand the virus, create vaccines, and control its spread as a result of the unprecedented challenges the COVID-19 pandemic has presented to global public health. Within this framework, there has been a great deal of interest in the relationship between seasonal viral fevers and COVID-19 vaccination. The objective of this abstract is to clarify the possible influence of vaccination programs on the frequency and severity of other viral infections by investigating the correlation between seasonal viral fevers and COVID-19 vaccination. Numerous investigations have examined the effects of COVID-19 vaccinations on the immune system and the immunological responses they elicit. COVID-19 vaccinations have been shown to elicit strong immune responses, including the generation of particular antibodies and the activation of T cells. This is especially true for vaccines based on mRNA technology and viral vector platforms. These reactions improve immune system performance in general and guard against severe COVID-19 strains. They may also affect the body's capacity to fight off other viral infections, such as seasonal viral fevers. Nevertheless, issues like vaccine hesitancy, uneven vaccination coverage, and the appearance of novel viral variants continue to exist. To maximize the beneficial association between COVID19 vaccination and the prevention of seasonal viral fevers, these problems must be resolved. Additionally, continued research is required to track the long-term impact of the COVID-19 vaccination on immune system function and its implications for the prevention of various viral infections. In conclusion, a thorough investigation is necessary into the complex relationship between the COVID-19 vaccination and seasonal viral fevers. In order to influence future immunization programs, public health regulations, and medical procedures—and ultimately help reduce the incidence of COVID-19 and other seasonal viral infections—it is imperative to comprehend how these variables interact.

INTRODUCTION

History

With the advent of corona virus in 2019 our medical system was challenged to the highest level all over the world. The novel virus was first identified in the city named Wuhan in China in December 2019 which is considered as the outbreak point of Corona virus disease (Conlon *et al*., 2021). Attempts which were made to keep the spread of virus failed, which allowed the spread of corona virus not only in other countries in Asia but also allowed it to spread worldwide in 2020.

As of July 2020 more, then 15.6 million people were affected by this severe acute respiratory syndrome of coronavirus, the virus responsible for coronavirus disease 2019; of these 9.92 million people died in India. An enormous amount of efforts was made in order to prevent and treat covid 19. Many trials of different vaccine were done to provide for the prevention and evidence for effective treatment.(Lamontagne *et al*., 2020) This created

***Corresponding Author:** Deepika Gupta

Address: Maharishi School of Pharmaceutical Science, MUIT, Lucknow, Uttar Pradesh, India.

Email ✉**:** deepika26009@gmail.com

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Table 1: Provides for the partial or complete Genome identification of coronavirus

Country	*No. of complete genomes*	*Partial sequences/ incomplete genome*	*Total*	*References*
Algeria, Argentina, Czech Republic, Greece, Hungary			3	Yosra A. Helmy
Australia	391		391	hCoV-19/Australia/NSW-ICPMR-49272/2023
Austria			21	GISAID. Global Initiative on Sharing All Influenza Data. Available online: https:// www.gisaid.org/ (accessed on 14 April 2020).
Belarus, Columbia, Pakistan, Thailand, Turkey	2		2	GISAID. Global Initiative on Sharing All Influenza Data. Available online: https:// www.gisaid.org/ (accessed on 14 April 2020).
Belgium	322	0	322	https://www.gisaid.org
Brazil	36		36	https://www.gisaid.org
Mexico, Nepal, Nigeria, Panama, Poland, South Africa, Sweden	1	0	1	https://www.gisaid.org
Canada	129		129	https://www.gisaid.org
Denmark, Mexico	9	0	9	https://www.gisaid.org
Finland			40	https://www.gisaid.org
Chile	7	0	7	https://www.gisaid.org
China	346	47	393	https://www.gisaid.org
Congo	42	0	42	https://www.gisaid.org
Georgia			13	https://www.gisaid.org
Ghana			15	https://www.gisaid.org
Hong Kong	64	26	90	https://www.gisaid.org
France	204	0	204	https://www.gisaid.org
Germany	64	0	64	https://www.gisaid.org
Iceland	601	0	601	https://www.gisaid.org
India	32	1	33	https://www.gisaid.org
Indonesia, Philippines	0	4	4	https://www.gisaid.org
Iran	1	23	24	https://www.gisaid.org
Ireland, South Korea	13	0	13	https://www.gisaid.org
Italy	39	5	44	https://www.gisaid.org
Japan	102	1	103	https://www.gisaid.org
Kuwait, New Zealand, Vietnam	8	0	8	https://www.gisaid.org
Latvia	5	0	5	https://www.gisaid.org
Russia, Slovakia, Estonia	4	0	4	https://www.gisaid.org
Luxembourg	86	0	86	https://www.gisaid.org
Malaysia	7	3	10	https://www.gisaid.org
Netherlands	585	0	585	https://www.gisaid.org
Norway	29	0	29	https://www.gisaid.org
Peru	1	1	2	https://www.gisaid.org
Portugal	100	0	100	https://www.gisaid.org
Senegal	23	0	23	https://www.gisaid.org
Singapore	37	0	37	https://www.gisaid.org
South Africa	6	0	6	https://www.gisaid.org
Spain	105	0	105	https://www.gisaid.org

Switzerland	52	0	52	https://www.gisaid.org
Taiwan	22	0	22	https://www.gisaid.org
United Kingdom	2540	1	2541	https://www.gisaid.org
USA	1467	2	1469	https://www.gisaid.org
Total	7655	118	7773	https://www.gisaid.org

an intense situation for the healthcare workers not only in India but around the world to prescribe drugs off-label which has very low level of evidence for the best example we can quote is Hydroxychloroquine (HCQ) which was recommended as drug for healthcare personnel handling covid-19 cases, frontline workers which were not having any kind of symptoms of illness, and asymptomatic contacts of the confirmed cases, while this might be of no benefit but of appreciable harm.(Siemieniuk *et al*., 2020)
Since the outbreak of the covid 19 many laboratories all over the world have been working in sequencing the genome of the causative agent (Table 1). As till 2020 a total number of 7665 all the genomes from 67 countries in the Global Initiative on Sharing All Influenza Data database (Helmy *et al*., 2020). Prior to the 2002 SARS outbreak, coronaviruses (CoV) were primarily recognized as the cause of gastrointestinal and mild respiratory illnesses. However, during this outbreak, CoV demonstrated its potential for epidemic spread and significant pathogenicity in humans. Three novel Beta coronaviruses have crossed the species barrier and caused significant outbreaks with high case-fatality rates in humans over the last 20 years: SARS-CoV, SARS-CoV2, and Middle East Respiratory Syndrome (MERS)-CoV. The COVID-19-causing SARS-CoV2 is the newest member of the family of human pathogenic coronaviruses (hCoVs) (Felsenstein *et al*., 2020).

Co-relation of COVID-19 vaccine with seasonal viral fever vaccine

As the influenza season was also going on and that further created more complex conditions, there is a keen relationship between the influenza vaccination and covid-19 susceptibility and disease severity. On the other side the liver is always exposed to the antigens, which is mostly derived from the intestine. Antigens present in blood circulate through the liver sinusoid which leads to the formation of unique atmosphere that is not suitable for foreign antigens and to forbidding chronic infections. Thus, this provides for the immune response to be of more importance as it provides for the prevention from foreign antigens that effect the liver adversely. Mostly evidences have been traced accordingly that immune defense cause the prevention of pathogens invasion in the liver.

Immune Memory

It is interesting to note that in some of the early studies, some individuals who were considered "virus naive" had memory helper cells (present in 50% of them) and killer T cells (20%) that could potentially combat SARS-CoV-2.(Sewell *et al*., 2020) We could take the example of Hepatitis as it is caused by murine corona virus, it is an acute disease persuade in the host and it also provides an easy and convenient way to understand the interaction of various viruses and liver cells. Earlier studies using genetic strain methods with different turning part of an organism in particular direction after the entry of viral provides for the play a climacteric role in the subsistence of liver invasion and development of Hepatitis. (L. Zhao *et al*., 2012) similarly this can also be seen in corona virus disease that provides the entry of pathogens within the liver of the host cells that makes for the attachment of the foreign antigen cells to the particular host cells and stops them performing in the normal conditions.
SARS-CoV-2 is identified as pandemic till the date covid-19 has affected about more than one million people all around the globe and this also marked about the death of more than two million people. As the secondary wave was about to end the more efficient were to be announced that can produce an effective action against severe acute respiratory syndrome coronavirus-2. The vaccines were started to be prepared as early as virus genome was published in January. The major difference which were scene during the preparation of vaccine was the vast number of technological platforms which were used during the preparation while some of these platforms have not been used in earlier preparation of vaccine. The first licensed vaccine product was Pfizer-BioNTech. Though, vaccines on coronavirus was not licensed on humans earlier. This also led to the research to the willingness of people to have the vaccination were considered to be around 55 to 90 %,(Lu *et al*., 2021) as the vaccine hesitancy was considered due the side effects of the vaccination, this is also seen in the case of coronavirus vaccination which could lead to several viral symptoms such as:

- Viral fever
- Cough
- Both can also be noticed in some of the patients

Structure, host range, and mechanisms of cell entry of viruses

The Torovirinae and Coronavirinae subfamilies make up the Coronaviridae family. Within the coronavirus family, there are genera such as Gamma and Delta coronaviruses that infect both birds and mammals and Alpha- and Beta coronaviruses that exclusively infect mammals. A beta coronavirus is responsible for all novel CoVs, including

SARS-CoV2, and human pathogenic alpha-coVs like OC43, HKU1, and NL63 (Felsenstein *et al*., 2020).

Seasonal influenza amidst of Coronavirus disease

According to certain case studies, COVID-19 and influenza infections have occurred simultaneously. According to these case studies, there is an increased risk of death when co-infection with COVID-19 and influenza results in symptoms such as viral pneumonia, adult respiratory distress syndrome (ARDS), and acute liver injury. Other pathogens causing similar severe manifestations could potentially increase patient morbidity and mortality, as COVID-19 already frequently sends patients to the Intensive Care Unit (ICU) due to ARDS (Ehrlich *et al*., 2020).

Mechanism of Infection

Notably, SARS-CoV2 exhibits more genomic regions than SARS-CoV, while the two viruses share almost 80% of their RNA sequence homology and 50% of their homology with MERS-CoV. To be specific, the viral spike protein that attaches to the host cell receptor is 20–30 amino acids longer than that of SARS-CoV and other coronaviruses that are closely related. So, it is plausible—even likely—that SARS-CoV2 employs immune evasion techniques that are similar to those of other coronaviruses, but it's also possible that SARS-CoV2 uses other, as-yet-unidentified mechanisms (Felsenstein *et al*., 2020). There have been reports of T cells and monocytes/macrophages becoming infected with SARS-CoV. To what degree and if at all, SARS-CoV-2 can infect these cell types remains unclear. SARS-CoV-2 may also be able to enter immune cells through the expression of ACE2, albeit at lower levels and not universally, on monocytes and macrophages. Nevertheless, additional receptors and/or virus-containing immune complex phagocytosis may also be implicated (Guihur *et al*., 2020).

Neutralizing antibody titers rising and SARS-CoV-2 RNA going away

Neutralizing antibody titers rising and SARS-CoV-2 RNA going away. For all patients with the exception of one (patient 2), we measured neutralizing antibody titers both prior to and following CP transfusion. Patients maintained the same level of neutralizing antibody titers following CP transfusion, while five patients showed an increase. RT-PCR analysis of SARSCoV-2 RNA revealed that, prior to CP transfusion, some cases had negative results and some patients had positive results. Notably, after receiving CP therapy, the levels of SARS-CoV-2 RNA in patients on second day of therapy, third day patients, and patient on day six were all reduced to undetectable. The neutralizing effect of CP on serum SARS-CoV-2 is supported by these findings (Duan *et al*., 2020).

By summarizing the current state of knowledge regarding the relationship between co-post-translational processing and the expression of S protein epitopes. This study combines data from the present investigation with data from a different study that examined the oligomerization process of the TGEV S protein (Delmas and Laude, 1990), (Delmas & Laude, 1991).

Our retrospective study included patients who were asymptomatic during the 2004 SARS outbreak, despite the fact that such cases were rare. This was after the Guangzhou wildlife market was reopened. Significantly, when they arrived at our hospital, patients 3 and 4 were afebrile. It is possible that the mysterious walking pneumonia cases are a source from which the outbreak is spreading (Chan *et al*., 2020).

Two doses of Corona administered at varying concentrations and according to different dosing schedules were found to be reasonably immunogenic and well tolerated in healthy adults between the ages of 18 and 59. There are no safety concerns related to dosage, but further long-term monitoring is required, as the incidence of adverse reactions was similar in the groups receiving 3 and 6 μg. Additionally, the majority of side effects were mild, with injection-site pain being the most frequent symptom. These results are consistent with earlier research using a different inactivated COVID-19 vaccine from Sinopharm (Beijing, China). Fourteen After receiving CoronaVac, the incidence of fever was comparatively low when compared to other COVID-19 vaccine candidates, such as those using viral vectors or DNA or RNA vaccines.(Sanche *et al*., 2020) Ground-glass pneumonic alterations were also revealed in a rather surprising discovery from the patient's lung CT scan, which was performed at the parents' insistence. Viral confirmation of an asymptomatic infection was later obtained for the patient.

Laboratory research

Diagnostic test for COVID-19:

Pharynx sponge for SARS-CoV-2 nucleic acid using a (RT-PCR) that is an excellence identifying test (Arabi Y *et al*., 2014). For the identification of SARS-CoV-2 virus with high standard of precision, specimens are obtained from following sites:

- Nasopharyngeal swab (Figure 1)
- Oropharyngeal swab (Figure 2)
- Nasopharyngeal aspirate (Figure 3)
- Broncho-alveolar lavage and saliva (Figure 4).

The sensitiveness of PCR trial be dependent on ensuing numerous component:

- specimen's adequacy
- time from exposure
- and specimen source

(Wiersinga *et al*., 2020) although, the accuracy of almost all commercialized FDA-give permission for SARS-CoV-2 PCR analysis is near about 100%, provided that there is no cross-contaminant throughout the time of sample clarifying. SARS-CoV-2 antigen tests are less responsive to but have a quickly reversal time than atomic PCR testing (Gandhi *et al*., 2020).

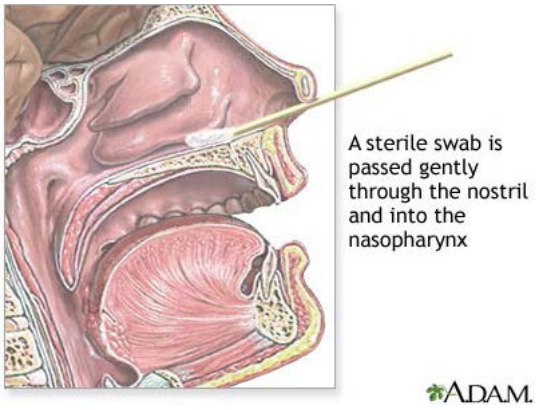

Figure 1: Nasopharyngeal swab

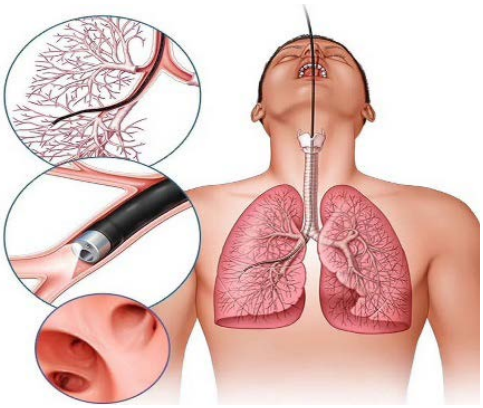

Figure 4: Broncho-alveolar lavage and saliva

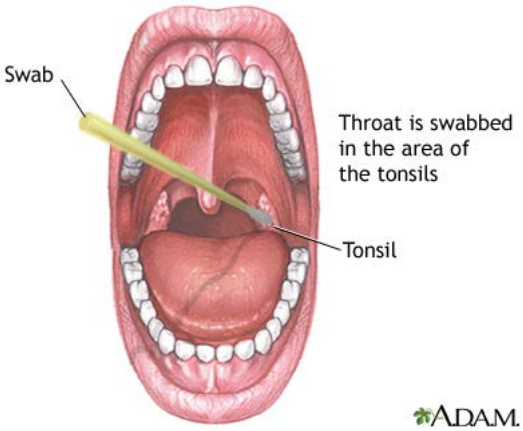

Figure 2: Oro-pharyngeal swab

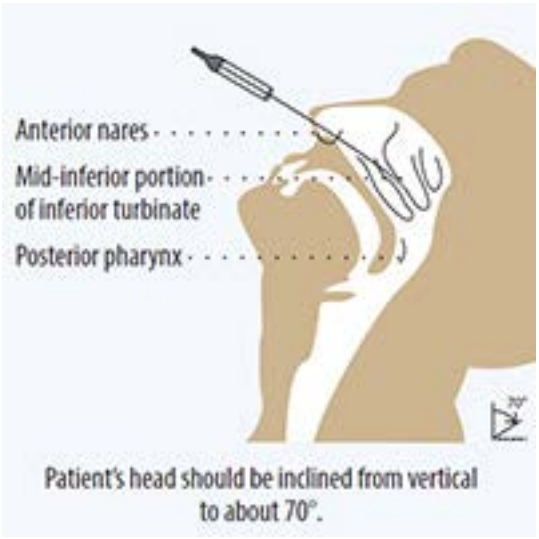

Figure 3: Nasopharyngeal aspirate

In spite of a lot of antibiotic tests draw plans of to date, serological testing has constraints in selectivity and sensitivity, and results from different tests vary.

In accordance with to the NIH guidelines, identifying an intense SARS-CoV-2 epidemic depends on serological examination is not prescribed. They are also stated that there is inadequate proof to suggest for or in anticipation of using serological testing to evaluate immunity, even if it used to guide clinical decisions about COVID-19 vaccines/ monoclonal antibodies.

Another Laboratory Assessment

- *Complete blood count (CBC)*
- Neutrophils ↑
- TLC ↑
- Platelets ↑

A comprehensive metabolic panel (CMP) that includes following:

- *Renal function test (RFT)*
- Serum Creatinine
- Serum urea
- Uric acid
- Sodium
- Potassium
- Calcium

- *Liver function test (LFT)*
- ALT
- AST
- ALP
- Total protein
- Total bilirubin
- GGT

- *Coagulation panel Test.*
- PT
- APTT
- INR
- D-Dimer

Further pilot study, such as ESR, C-reactive protein (CRP), ferritin, lactate dehydrogenase, and procalcitonin, in hospitalized patients. In whatever way, their prognostication consequence in COVID-19 is not clear.

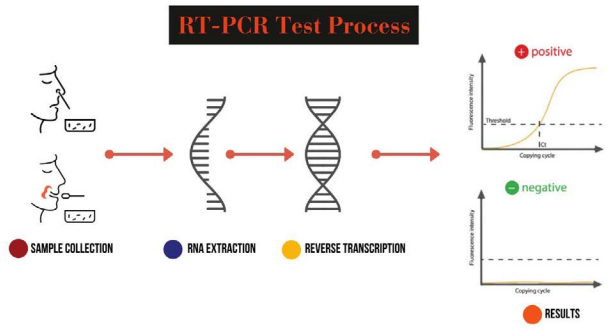

Figure 5: Broncho-alveolar lavage and saliva

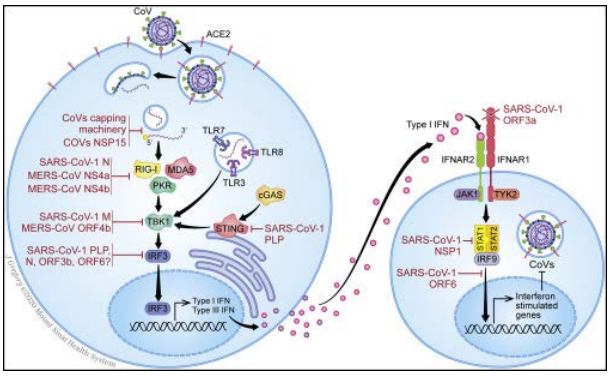

Figure 6: Immunological Functions

A D-dimer level is stand in need of as it guides the use of analeptic versus prophylactic doses of anticoagulation.
Imaging Modalities this viral illness commonly manifests as pneumonia,

- *Radiological imaging such as Following*
- Chest x-rays,
- Lung ultrasounds,
- Chest computed tomography (CT) is often obtained.

When obtained, the chest X-ray usually shows bilateral focal alveolar opacities at various sites. Pleural effusions can also be shown. The most common CT chest findings in COVID-19 are focal at various points bilateral ground glass opacities with consolidation changes, usually in a patchy peripheral distribution. (Bao *et al*., 2020)
Radioscopy picturing is not a responsive procedure for identify this infection. A retroactive analysis of 64 sick person with recorded COVID-19 describe that 20% had no anomalies on chest shadowgraph during the sickness. (Wong *et al*., 2020) A chest CT is more responsive than a radiograph but is not described (Figure 5). No finding on radiographic imaging can completely rule in or rule out COVID-19 illness. Therefore, the radiology department of American college (American College of Radiology) advises against the routine use of chest CT for screening or diagnosis of COVID-19. [ACR Position Statement for Diagnosis of COVID-19]

Immunology

It is interesting to note that in some of the early investigations, some individuals who were considered "virus naive" had memory helper cells (present in 50% of them) and killer T cells (20%) that may have been active against SARS-CoV-2. These cells may be a welcome sign of potential background immunity to COVID-19 in populations at risk, when the antibodies were absent. They may also result from cross-reactions to other circulating coronaviruses, such as several common cold viruses.
Any cellular immunological for SARS-CoV-2 memory in the community may improve vaccination responses and may also accelerate the development of immunity of herd for a vaccination program.(Ramasamy *et al*., 2020) Previously used memory aid T cells that are specific to SARS-CoV-2 may increase the production of neutralizing IgG antibodies in the blood of individuals who have recently been exposed (Figure 6). Additionally, IgA in saliva, tears, or nasal secretions may improve antibody protection at mucosal surfaces.13 through 15 At typical viral entry sites, these IgA antibodies serve as a barrier to protect.(Sewell *et al*., 2020) The primary cause of death from SARS-CoV-2 infection is acute respiratory distress syndrome. Globally, COVID-19 has already resulted in over 870,000 deaths as of early September 2020. Acute respiratory distress syndrome (ARDS), one of the top three complications following sepsis, progresses the disease in the most severe cases and leads to respiratory failure and death. As a consequence of lung damage, protein-rich inflammatory oedema fluid accumulates in the alveolar space, causing non-cardiogenic pulmonary oedema and reduced arterial oxygenation that require mechanical ventilation.(Guihur *et al*., 2020)

Antibody measurement

Using Biological Pharmacy Enterprise Co., Ltd.'s of Beijing Wantai enzyme linked immunosorbent assay (ELISA) kits, the Ab, IgM, and IgG antibodies against SARS-CoV-2 in plasma samples were examined in accordance with the manufacturer's instructions. In short, the domain of receptor binding the protein of SARS-CoV-2 spike was used in the development of the ELISA for the detection of total antibodies, which on the basis of double-antigens sandwich immunoassay (Ab-ELISA). The antigen was conjugated with HRP and expressed in mammalian cells. Utilizing the same HRP-conjugate RBD antigen as the Ab-ELISA, the IgM μ-chain capture method (IgM-ELISA) was utilized to identify the IgM antibodies.(J. Zhao *et al*., 2020).

Patients and Methods

Every patient underwent daily anteroposterior chest radiography; all chest radiographs were reported collaboratively by respiratory physicians and specialist radiologists; we performed high-resolution computed tomography of the thorax for patients whose chest

radiographs appeared normal, ambiguous, or atypical; for patients who developed acute respiratory distress syndrome with partial arterial pressure of oxygen (PaO2) to fraction of ins; we entered the daily clinical findings construct on the chronicle and in the flesh examination, oximetric measurement, and investigations like haematological, biochemical, radiological, and microbiological. At the time of presentation and on day 14 following the commencement of their illnesses, we obtained nasopharyngeal aspirates and clotted blood for virologic investigations from every patient.(Peiris *et al*., 2003)

Trial Protocols

Trial participants were randomly assigned to groups based on vaccination candidate, dose level, and age range using an interactive Web-based response technology system. One participant group, consisting of individuals aged 18 to 55 and another, was given doses of 10 µg, 20 µg, or 30 µg of BNT162b1 or BNT162b2 (or placebo) on a two-dose schedule. BNT162b1 or a placebo were given in 100-g doses to participants aged 18 to 55. Every participant had two 0.5-ml injections into the deltoid, spaced 21 days apart, of either the active vaccine (BNT162b1 or BNT162b2) or a placebo. Observations were made for four hours following injection to identify any immediate adverse events. The first five participants in each new dose level or age group (with a randomization ratio of 4:1 for active vaccine:placebo) were considered. For thirty minutes, every other participant was watched. For tests of immunogenicity and safety, blood samples were collected.(Walsh *et al*., 2020).

Information from SARS-CoV nucleic acid testing

Nine patient specimens were thought to be false positives since they showed a signal on one or more RT-PCR assays at the NML. Among them were two patients who had tested positive for hMPV at the NML through PCR testing. Homology to SARS-CoV sequences was observed upon analysis of the amplicon sequences from three suspected false-positive PCR specimens at the NML (lung, stool, and respiratory). The BCCDC's RT-PCR test revealed no SARS-CoV positive specimens.(Patrick *et al*., 2006)

Aims & Objectives

Aim

The main aim to conduct this research is to provide corelated factors of corona vaccination in relation with other viral seasonal fever. The comparison in done on the basis various factors which include:

- Symptoms that occurred after the vaccination for corona virus.
- Symptoms that are seen in the patients suffering from seasonal viral fever.
- Similar symptoms that are noticed in patients suffering from either Covid-19 or viral fever.
- Identification the point of difference between the drugs provided for seasonal viral fever and corona virus.
- Preparation to prepare the competent drug for tackling both the disease by single dose.

Aim of this paper include various prospective that can be used to evaluate for the research methods that has been employed during the research of Covid-19 vaccine preparation. It also includes identification of symptoms and later research is done in order to produce sufficient therapeutic effects for prevention of disease with respect to other viral seasonal viral fever. As in some of the cases it was noticed that the pre-symptoms are considered to be similar to various other viral disease outgoing at that time that provides the building block for this research paper to find the corelated factors and provide for accurate and effective therapeutic drug.

The aim is not only to make the theoretical presentation but also to provide a better supportive concept for future aspect that makes the information available for enhancement in aiding ongoing research in same field.

Objectives

Objective include various procedures that are used to achieve the aim of paper that includes several methodologies on basis of which various essential information is gathered and provided for the further process. This information includes kind of research methods used to collect data and later to use that collected data for building the platform of research paper.

The objectives for this paper include the type of surveys that are commenced to gather information, analysis of articles and journals that provide of the earlier information required for promoting the concept of correlation factors among several disease, procedures required for preparation of particular dosage that provide sufficient therapeutic effect, there are several other factors are kept in the mind for achieving the aim of this paper.

The points which are kept in mind while conducting the research to achieve aim of this paper includes such as:

- Collecting various information related to Corona virus disease and seasonal viral fever from various research and review papers available.
- Analysing the required data from various sources of information that provides content used for preparation of corona virus vaccination and seasonal viral fever.
- Conducting the survey for collecting local data to evaluate the required information by visiting several places to make information available.
- Preparing graphical representation for research paper by presenting the similar content available and later presenting the available data correctly.

The main of objective of conducting this research is to provide for the helpful information in regards with correlation of various factors of COVID-19 vaccination that sets as the base for various other seasonal disease such as Influenza fever, Hepatitis, Cold, Cough, Heart related disease and several other diseases that were prevalent

at that time. In order to do so various parameters were applied such as antibodies measurements, immunological action of antibodies in several other viruses were studied and implied through evaluating that particular information important to this research.

Research and Methodology

Research is basic overview that looks for search of knowledge. Research can also be defined as a scientific and systematic search for relevant information on a particular topic. In fact, research is considered as academic activity and as such the term should be used in technical sense.(Bretschneider *et al*., 2005) As Clifford Woody defines research as "It comprises defining and redefining, problems formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deduction and reaching conclusion; and at last carefully testing the conclusion to determine whether they fit the formulating hypothesis."(Davidavičienė, 2018) Thus, research is a real contribution to the pre-existing stored knowledge providing for its modification. In brief, the scout for knowledge through neutral and organized methods of exploring solution to a problem is research.(Kratochwil & Friedrichs, 2009) There are various types of research that are used to explore solutions of existing problem some of them are such as follows:

Descriptive vs Analytical

Surveys and fact-finding techniques of various other kinds are included in the descriptive research. The major aim includes description of the condition of problems as they are at present condition. In social and business kinds of research we usually use Ex post facto research term for descriptive studies(Thompson, 2009). On the other side, the researcher uses information already available and later analyse to make the proper evaluation of the problem are considered as analytical research.(Greenwood *et al*., 1991)

Applied vs Fundamental

Finding solutions for problems related to industrial or business organisation, society on an immediate basis is known as applied research. On the other hand, fundamental research is related to generalisation and formulation of theory. Research related to any natural phenomenon or some mathematical expressions are example of fundamental research. Whereas research done in social, political and social end is example of applied research.(Coulman, 1985)(Hansen & Schieberle, 2005)

Quantitative vs Qualitative

Research based on any characteristics that can be measured in terms of quantity are named as quantitative research. It can only be applied on phenomena that are expressed in terms of quantity(Barnham, 2015). Qualitative research on the other hand is based on the quality trait phenomenon (phenomenon that include quality type or kind).(Lakshman *et al*., 2000)

Conceptual vs Empirical

Conceptual research is related to some new ideas or theories which is generally used by thinkers in order to make the theories in new format is or reinterpret the existing concepts(Barrera & Ainlay, 1983). Empirical research consists of learning or observing things frequently without delay in regards for system theory.(Baer, 2003)

Some Other Types of Research

By other kind we mean variation of all other kinds of research that are mentioned above, on the basis of purpose of research, or the time that is required to complete or finish the research, environmental conditions are also considered while conducting the research, or on the basis of various factors which are similar. (C.R Kothari)

Methodology

Non- sampling errors

Sampling frame refers to the method used to get access to the population. In order to determine which members of the population to pick sample from during the survey design phase, lists of homes, workers, employers, special interest groups, etc. are frequently compiled for surveys of human populations. After a brief overview of three national-scale probability-based environmental surveys, each of the three forms of non-sampling errors will be discussed, with special attention to survey design elements that might contribute to non-sampling error. The prevalence of each of the three categories of non-sampling mistakes in each of the three environmental surveys will be the final topic of discussion. Various strategies to address non-sampling flaws in these environmental surveys are discussed (Society & Statistics, 2016).

Sample Survey Vs Census Survey

In a sample survey, therefore we read up on only a constituent of the entire population, lower amount of money and for a short time. A majority of the time, non –exemplification misconception is a lot of large that the results of illustrative survey are significantly more accurate than those of census survey. Non-exemplification delusion become apparent attributable to a number of components such as incompetence of investigator, non-response, partiality due to interviewers, etc. These errors are likely to grow when the number of units inspected increase. (Nirel & Glickman, 2009)

Although, if the purpose of the study is very serious in the natural world and documentation is need about each and every exemplification unit, there is no way out but to resort to census survey. Moreover, if time and money are not important factors or if population is not large, census survey may provide better results than the any sample

survey, provide efficient and trained staff is employed. (C.R. Kothari)

Types of Sampling Designs

The methods of selecting are of fundamental importance and depends upon the nature of data and investigation. The techniques of selecting a sample are classified as- 'non-probability sampling' and 'probability sampling', We take up these two designs separately.(Jawale, 2012)

The New Coronavirus Pneumonia Prevention, released by the National Health Commission of China, served as the basis for the definition of a confirmed COVID-19 case and the clinical classification. In summary, a patient was identified as a COVID-19 case if they had a history of acute respiratory infection syndromes, abnormalities in their chest CT scans, and detectable SARSCoV-2 RNA in their respiratory sample since the beginning of their illness. With an oxygen saturation level of less than 93% or ARDS, patients were categorized as critically sick and in need of either non-invasive or invasive mechanical ventilation.

A total of 173 COVID-19 patients who were admitted to the Shenzhen Third People's Hospital between January 11 and February 9, 2020, and who agreed to contribute their blood samples are included in this study. Every case enrolled.(Silva-Cayetano *et al*., 2021)

Non-Probability Sampling

Various non-probability sampling techniques used in survey contexts are included in the first family of data collection methods. Although these techniques have long been seen as inferior, their increased affordability, flexibility, and speed of deployment are reasons why they are becoming more and more popular these days.(Buelens *et al*., 2018)

Probability Sampling

Although the techniques of controlled selection have wide, general applicability in all types of probability sampling, it was for the selection of first-stage units that these methods were developed and the emphasis in this paper is upon their application to this particular problem.(Goodman & Kish, 1950) In probability samples, precision is mainly a function of sample size: the larger the number of subjects, the tighter the confidence intervals around point estimates of prevalence. (Cumming, 1990)

Complex Random Sampling Design

Using aggregate simple random sample approaches on data obtained from complex sample designs, as we have argued, biases estimated variances to the extent that the sample's clusters are homogeneous. A method for assessing and correcting for potential bias in the estimates must be found if the analyst decides to use data gathered through a complex sample design in an aggregate analytical approach. (Thomas & Heck, 2001)

To complete this research, we opted combination of various research methods such as descriptive research which is considered with the various information from different sources including the facts that is important for this research such as the origin of the disease which includes the history of pathogenic conditions that are considered with the spread of virus worldwide. Side by side with the use of descriptive we also preferred the use of analytical research for the advancement to the theory that are available prior to the studies and make particular data available for the use of research analysis this includes immunology, antibody measurements and various other relevant topics which helps in completing this paper.

This also makes the use of this evaluated data for the preparation of graphs and the surveys which were conducted by dividing the population on the basis of age group and further to represent them in the form of graphs of mostly used medication and its correlation with other disease that are also producing its effect on large scale of population. Surveys were performed on the basis of samples surveying methods that include the collection of data by representing the small or large group of population or area.

Data Analysis

In this paper various analytical methods is being evaluated such as:

- The dataset was first subjected to a descriptive analysis in order to identify patterns in the incidence of other viral fevers and COVID-19 vaccination rates around the clock. This study gave rise to a foundational knowledge of the temporal patterns and distribution of data.
- The correlation between the rates of COVID-19 vaccination and the occurrence of other viral fevers was calculated using correlation analysis. Initial correlation trends (positive, negative, or negligible correlations, for example) are suggested by preliminary findings.
- Regression Modeling: Regression modeling methods were used to examine the relationship in more detail. Our objective was to clarify the precise influence of COVID-19 vaccination on the occurrence of other viral fevers by accounting for confounding factors like population density, healthcare infrastructure, and public health interventions.
- Visualization: To effectively convey our findings, we used data visualization techniques like scatter plots, heatmaps, and time series plots. Any observable trends or patterns in the data are illustrated by these visualizations.

Results & Discussion

Result

Coronavirus Colds with Intranasal (l-2b Interferon) the symptoms of coronavirus colds were significantly reduced when rIFN was used. In contrast to 12 (41070) of the 29

rIFN recipients, 19 (73070) of the 26 placebo recipients satisfied the symptom-score requirements for a cold (P =.02). In the six days following the challenge, the mean nasal symptom score for the placebo recipients was 9.2, while it was 5.4 for the rIFN recipients (P =.03). In the two groups, the total symptom scores were 23.2 and 9.4, respectively (P =.003).

Although vaccine development of COVID-19 is still in progress, it is critical to establish expectations for this vaccine and vaccines against other emerging viruses. Obviously, the vaccine must be safe, effective, and not cause enhancement upon subsequent disease infection, either via antibody-dependent enhancement or vaccine related to enhanced respiratory disease, as has been noted with some SARS-CoV vaccines in models related to past. (Riel & Wit, 2020)

Bias potential in the studies included

The evaluation of each outcome's bias risk for each of the included studies is provided in the supplemental material. In every category, two studies were rated as having minimal bias risk. In the areas of randomization and deviation from the intended interventions, all other studies most likely had a high or high risk of bias.(Siemieniuk *et al*., 2020)

The Covid-19 disease is mainly caused by (zoonotic) severe acute respiratory syndrome corona (SARS-CoV-2). The findings of our investigation suggest that influenza vaccination has non-deleterious effects on the susceptibility to COVID-19 or the severity of the illness, and that there may be a correlation between the vaccine and a lower risk of COVID-19 and better clinical outcomes. A retrospective chart review and data at patient level were used to support the hypothesis that influenza vaccine may provide protection against COVID-19, which has been the subject of recent conjecture10. In line with earlier studies3,4, we discovered that older patients and those with pre-existing comorbidities had greater COVID-19 rates.(Conlon *et al*., 2021)

Identification of coronaviruses

Of the 128 (68.7%) screened samples, the real-time RT-PCR panel found 88 HCoV, while the pan-CoV assay found 128/1137 (11.2%) CoV-positive samples. NL63 (50.0%) and OC43 (27.3%) were the two most commonly found HCoV species. In 17.0 and 5.7% of the samples, respectively, the 229E and HKU1 species were found. Logistic regression analysis was used to assess the CoV infection in the settings under study.(Cabeça *et al*., 2013)

Parameter used for patient

Among patients infected with HCoV, the median age was 28 years old (range: 1 month to 68 years). Patients in the 50–59 age group experienced a higher frequency (15.9%). The age-specific distribution of CoV-positive cases. The majority of patients with infection were female (60 9 28, P < 0.001). Of the infected patients, sixteen percent (16/88) had underlying medical conditions such as congenital kidney and lung diseases, diabetes mellitus, liver transplant, megacolon syndrome, hypertension, megacolon syndrome, and infections caused by the HIV. (Cabeça *et al*., 2013).

Discussion

On the basis of this graph we can conclude that people in mid age category are considered with lower percentage of covid-19 vaccination as many of these people were suffering from other viral diseases such as diabetes, thyroid, asthma, influenza virus disease and hepatitis etc (Figure 7). As they were at the higher risk of getting effected by the Severe acute respiratory syndrome of Covid-19, after the vaccination there are adverse reaction which were seen in various patients suffering from the various other disease and also in some cases these adverse reaction led to the cause of death among the patients so most of the people were backed off to take the vaccination this also creates the problem of cold, cough and viral fever this also makes the mortality rate increment.

On the basis of gender, we can conclude large number of populations were of male as their immunological activity is more stable when compared to females (Figure 8). On the other hand, if we talk about the awareness in females this led to vaccination among the female and further leading to the way in the increment of the percentage of people vaccinated as a whole.

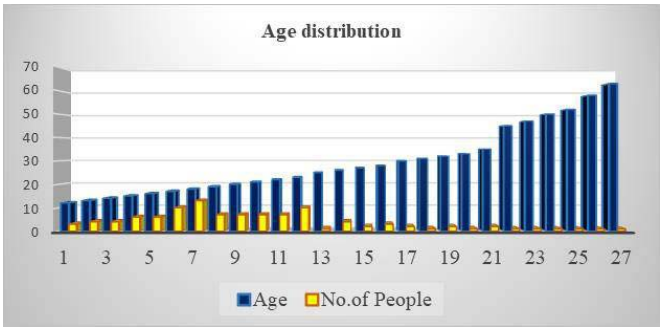

Figure 7: Vaccination according to age

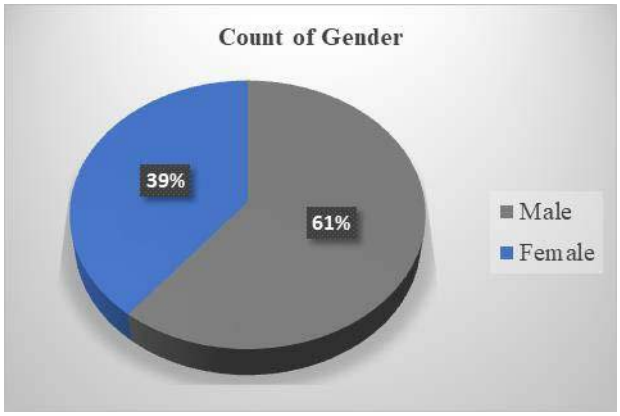

Figure 8: Vaccination according to Gender

This graph represents the proportion of people who are related to health management such as doctors, nurse, pharmacists etc. As they were at the frontline risk by getting effected with Corona virus disease they were the first to be provided with the vaccination dose and if there were adverse reaction that led to other seasonal viral disease (Figure 9). As they have similar symptoms to the prior stages of corona disease that is considered with formation of cough or having problem while breathing so by keeping their situation doses were made available to them at the first.

We witnessed the situation where all work was made to shut down completely over worldwide but there were some essential services needed for the survival of life and they were provided by some service provider so they were given with this responsibility to make these things available for public (Figure 10). In order to provide with these things essential service provider was given preference of vaccination. They are ahead to be vaccinated if compared to normal people due to their direct connection with the public. The cleaning/hygiene workers are considered to be essential elements of society (Figure 11). They played an important role during the covid-19 phase though they were majorly in contact to various other pathogens that can cause influenza, hepatitis, or any other disease due to their correlation with the pathogens that resembles as the adverse reaction after the vaccination for Covid-19 such as cold or viral fever. Yet they were left out to be vaccinated for over the higher rate this increase the mortality rate of these people (Figure 12). So after conducting the survey we get to know about the various the conditions that were endured by these people as they lacks with the basic equipments required during at that particular time interval.

The vaccination rate of India is considered with the highest among other nations when compared (Figure 13). It was only made possible due to the advertising methods used and awareness provided among the public in regards of vaccine and later this also provide awareness campaign not only for the vaccination for COVID-19 but also for vaccination to other disease that were prevalent along with corona virus disease (Figure 14). This campaign not only provides for the advancement for the promotion but also makes for the effectiveness of this vaccination with reference to other viral disease.

After conducting the survey, we get to know that people after getting symptoms of cold, cough or viral fever they stepped back from taking the booster doses as this also creates the condition of severeness among patients affected with other disease that is the reason why the patient history was considered to be most important before vaccination specially for the people suffering with Diabetes (Figure 15).

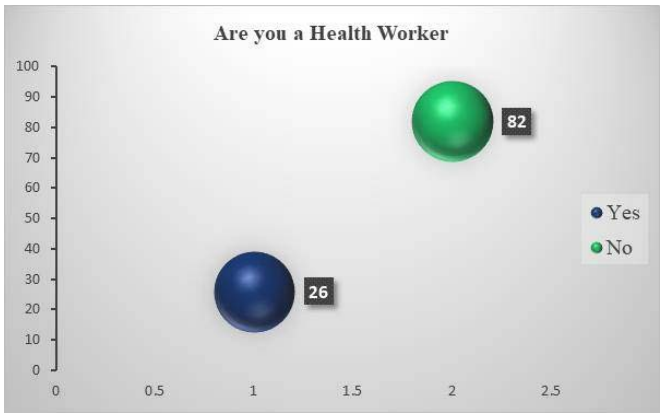

Figure 9: Graph representing health workers vaccination

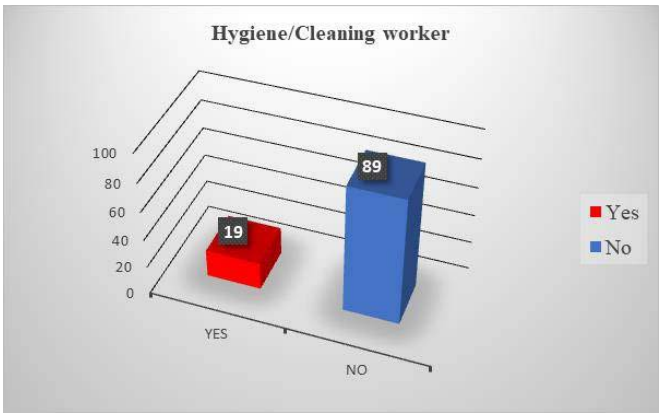

Figure 11: Graph representing hygiene workers vaccination

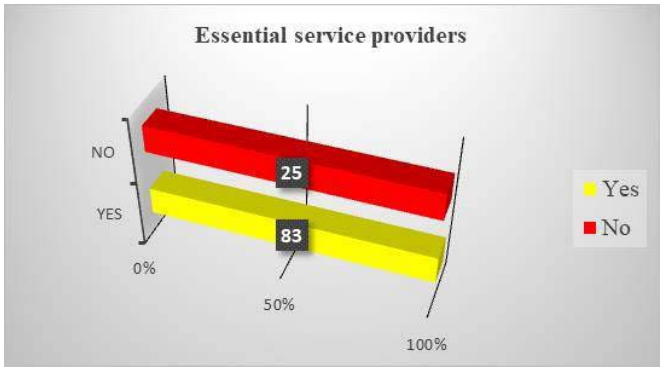

Figure 10: Graph representing essential service provider vaccination

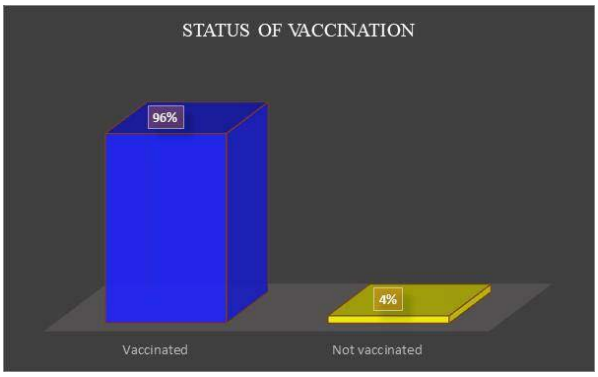

Figure 12: Graph representing vaccinated population

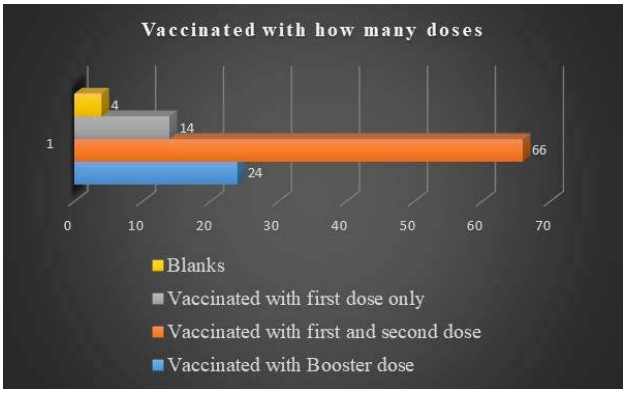

Figure 13: Doses people vaccinated with

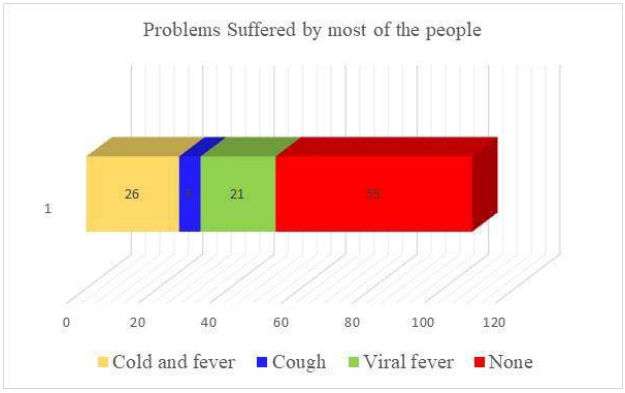

Figure 15: Vaccine people gets for Vaccination

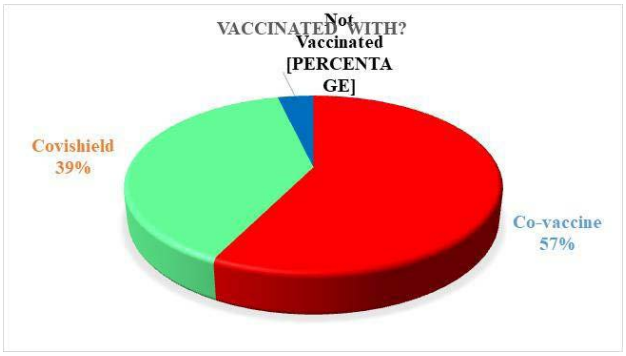

Figure 14: Vaccine people gets vaccinated with

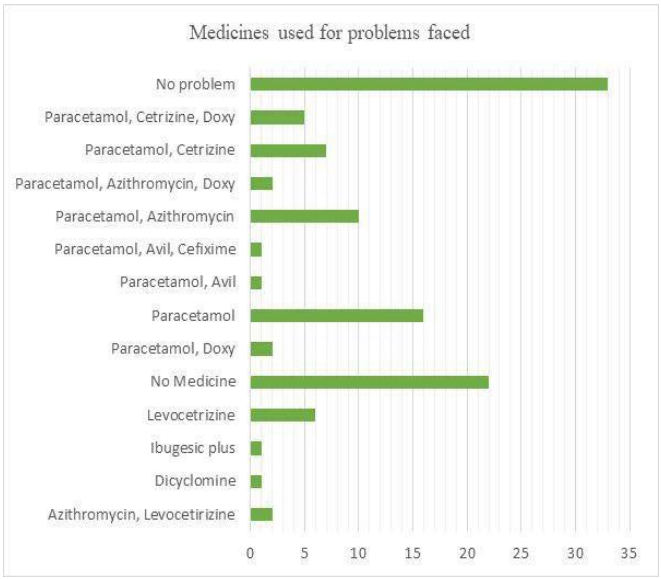

Figure 16: Medicines prevalent to tackle the adverse reaction of vaccination

It was witnessed that there were two vaccines which were prevalent for the use as effective dose against COVID-19 It was seen that most of the vaccination centers were providing the dose of Co-vaccine and this makes more competent use of this vaccine as it was prepared by Bharat Biotech's (Bio-Safety level 3). This was developed using Whole-Virion Inactivated Vero Cell. Numerous vaccines for disease such as Seasonal Influenza, Polio, Rabies etc. Covishield vaccine has been approved for active immunization of individuals aged 15 years and older for preventing of COVID-19.

It was seen that after the vaccination there were some common adverse reaction that was witnessed in every patient these reactions include cold, viral fever, cough and several other symptoms were noticed. It can be said that on the basis of surveying we can conclude the percentage of people who suffers from any of these symptoms were at much lower rate as compared to the people who suffered from any of these symptoms and later this was scene that people who suffered any of these diseases were having some sort of prior history with the disease.

Medicines which were provided in order to prevent the adverse reaction of vaccination were according to the graphs that made us updated regarding the mechanism of action of various drugs that can be given in correlation with the COVID-19 vaccination to suppress the other viral disease effects also (Figure 16).

Conclusion

Coronavirus vaccines, like the COVID-19 vaccine, are made to specifically target the virus that causes the illness. They don't offer protection against other bacteria or viruses that can cause seasonal fevers, like the flu or the common cold. Because scientific knowledge is always expanding, new vaccines may be created or old ones may need to be changed to cover a wider variety of viruses. There are constant efforts to develop new vaccines and enhance those that already exist in the dynamic field of vaccination. Importantly, the association between vaccination against coronavirus and other seasonal fevers is indirect and mainly pertains to the overall effect on public health systems and preventive measures. To be updated on the most recent developments regarding vaccines and their effect on infectious diseases, it is advised to follow credible health organizations and research studies as new information becomes available.

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Questionnaire

Q.1: Are you a health worker?

☐ Yes

☐ No

Q.2: Are you an essential service provider?

☐ Yes

☐ No

Q.3: Are you a hygiene/cleaning worker?

□ Yes

□ No

Q.4: Status of vaccination?

□ Vaccinated

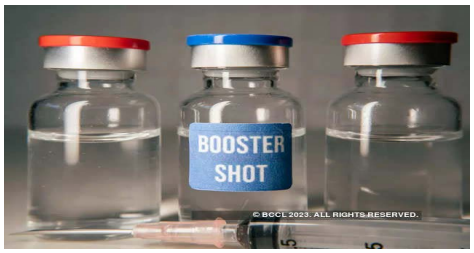
□ Non-Vaccinated

Q.5. Vaccinated with how many doses?

□ Vaccinated with first dose only

□ Vaccinated with first and second dose

□ Vaccinated with booster dose



□ Vaccinated with second booster dose

Q.6: Vaccinated with?

□ Co-vaccine

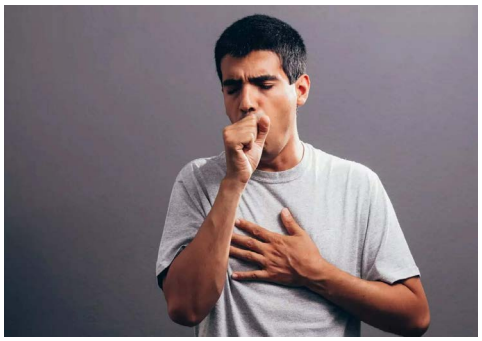
□ Covishield

Q.7: Have you get any of the following problems in the last one year?

□ Cold and Fever

□ Viral Fever

□ Cough



□ None

Q.8: If yes what kind of medicine was taken?

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