

Current Public Health Recommendations Regarding COVID-19

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The pandemic has caused significant public health problems affecting both the general population as well as specific groups, usually at high risk of the disease. There are also several questions concerning vaccination and the possibilities of therapeutic intervention. Mutations is another serious issue. Also, the behavior, within society as a whole, of those who have been vaccinated and have received either one or both doses of the vaccine. Issues related to medical treatments are also raised. The following article aims at providing the right answers to the aforementioned topics of discussion, to the extent possible.

Pregnancy - women planning a pregnancy:

Serious illness is rare in these age groups of women, but, compared to the general population, it is more common in the ones already pregnant. Pregnant women are therefore more at risk of developing serious illness due to COVID-19. Furthermore, pregnant women with COVID-19 present an increased risk of miscarriage and premature birth .

Vaccines do not appear to be an increased risk for this group. Animal studies by Moderna, Pfizer, and Johnson & Johnson have not demonstrated an increased risk of adverse events. After all, mRNA vaccines, like the first two mentioned above, do not enter the nucleus of human cells and do not affect genetic information.

Although the Johnson & Johnson vaccine is a vector, i.e. a DNA vaccine, clinical trials have shown that it does not cause any particular problems.

Breast-feeding: There are no studies on the effect of COVID-19 vaccines on breast-feeding mothers, breast-fed infants, and milk production. It is believed that vaccines are not a risk factor for mothers and newborns, so breast-feeding mothers should be vaccinated.

In expectation of pregnancy: During this period there is no particular risk and vaccination should be performed. There is no evidence to suggest that vaccines could cause fertility problems. Of course, further results are expected, because studies on the subject are ongoing.

Individuals with weak immune response:

Individuals infected with HIV, but also people who suffer from other diseases that cause immunosuppression, as well as patients taking immunosuppressive drugs, may be at increased risk of developing COVID-19 and should therefore be vaccinated. In this particular case, the problems are the lack of clear data on the safety of vaccines for these individuals as well as the adequacy of the immune response after vaccination.

Individuals suffering from autoimmune diseases:

They may be vaccinated against COVID-19. Regarding this group, however, there is not enough data concerning the safety of the vaccine.

Individuals with Guillain-Barre syndrome:

They may be vaccinated against COVID-19. To date, no cases of the syndrome have been reported after vaccination with mRNA vaccines. One case was reported after vaccination with the Johnson & Johnson vaccine. Yet, in the same study, a case occurred in the placebo group also.

Individuals suffering from Bell's palsy:

They may be vaccinated against COVID-19. Cases of this type of palsy have been reported in clinical trials. Their frequency, however, does not seem to be higher than that of the general population.

Allergic individuals:

An allergic reaction is considered serious when a patient needs to receive epinephrine or when it is deemed necessary to

transport them to the hospital. Many times this allergic reaction is referred to as anaphylaxis or anaphylactic reaction. An immediate allergic reaction occurs within 4 hours after vaccination and is characterized by wheezing, edema, and rash. If there is any allergy to any of the components of the vaccine, even if it not deemed serious, the individual in question should not be vaccinated. This applies to both mRNA (Pfizer, Moderna) and DNA (Johnson & Johnson) vaccines. If there is an allergy to one of the vaccines, the possibility of taking another, even as a second dose, is seriously considered. That is, if there happens to be an allergic reaction to the first dose, then the second could be done with another vaccine. Allergic reactions usually occur to polyethylene glucose (PEG) and to polysorbate. The first substance is a component of mRNA vaccines while the second is a component of the Johnson & Johnson vaccine. Based on these data, the choice of vaccine should be made accordingly. Any pre-existing allergy to another vaccine or injectable medicine should also be reported. The physician will offer appropriate advice. If there are allergies that are not related to allergies to vaccines or injectable drugs, such as allergies to food, pets, latex, etc. or to any oral medication, this should not be a contraindication to vaccination.

Individuals with comorbidities: Any adult over the age of 16 in this particular group should be vaccinated, as they are at high risk of developing serious COVID-19 disease if they become infected. This category includes patients with respiratory and heart failure, ischemic heart disease, hypertension, COPD, asthma, diabetes mellitus, and Down syndrome. In addition, people over 65 are considered to be at increased risk of serious illness, as well as overweight people regardless of age.

Professionals dealing with the elderly and with people with disabilities: They offer medical assistance, but also provide support as far as daily activities are concerned, usually for the elderly and disabled. They are at increased risk of contracting COVID-19, so they should definitely be vaccinated. In this particular group, as of November 6, 2020, there had been 616,000 cases of the disease and 91,500 deaths in the United States.

Health professionals: This category includes: doctors, nurses, students and medical residents, dietitians, administrative officials. There is an increased risk of COVID-19 infection in this group,

but also of transmission of the disease to other negative patients. All members of this group should be vaccinated. When healthcare personnel are vaccinated, the contagiousness of the disease becomes lower, especially in-hospital.

What to expect after the vaccination: There may be mild discomfort, such as pain at the injection site, erythema, and swelling. Also headache, fever, muscle aches, chills, and nausea. These symptoms are to be expected and last for two or three days. If they are prolonged or severe, then a doctor should be contacted. Usually two doses of the vaccine are needed, except for Johnson & Johnson, which needs only one. The interval between the first and second dose varies depending on the vaccine, from 3 to 6 weeks. After full vaccination, we can engage in activities that we had abandoned due to the pandemic, e.g. meet with other vaccinated individuals without wearing a mask.

SARS-COV-2 mutations: All viruses, including the one that causes COVID-19, are constantly evolving. When the virus replicates, making copies of itself, it sometimes changes a little. This is common with viruses. These changes are called “mutations”. A virus that carries one or more mutations is considered a variant.

What causes changes (mutations, variants) in a virus? When the virus spreads and is transmitted to a large number of people causing multiple cases of infection, then the number of mutations increases. The more the virus spreads, the more it mutates. Most mutations have little effect on the ability to cause disease. Sometimes, however, if changes are made at critical regions in the virus genome that determine transmissibility and toxicity, the behavior of the virus changes alike. That is, it can be more difficult or easier to transmit or cause a more severe or mild disease.

What is the effect of mutations on the effectiveness of vaccines?

The vaccines that are already in circulation show at least some protection against mutations, because they provoke an extensive immune response that involves the production of antibodies but also the activation of certain cells (B- and T-lymphocytes). This is the reason why mutations do not completely inactivate the vaccines. Vaccines may need to be modified in order to be effective against mutations. Research in this field continues and the WHO has several research protocols

on the subject. We must do everything possible to stop the spread and thus prevent the mutations of the virus. All individual sanitary protection measures should be implemented (masks, hand washing, keeping safe distance).

WHO and mutations: The virus genome has been identified and its sequence can be found in the GISAID database. Research is being conducted in order to determine the genetic mutations and their effect on the viral transmissibility and toxicity. All vaccine companies are provided with information regarding the prevailing mutations and vaccine re-engineering.

What can we do to prevent mutations? Individual hygiene-sanitary protection measures must be adhered to (hand washing, mask utilization, keeping safe distance, adequate space ventilation, avoidance of crowd gatherings). By limiting the transmission of the virus we will also be able to limit its mutations. As the number of people vaccinated increases, the circulation of the virus is expected to decrease, which in turn is expected to reduce mutations.

Should vaccination schemes be carried out despite mutations? We must insist on vaccination schedules, even if there are already known mutations or others are going to occur. Vaccines are the most effective weapon we currently have. We must not fail to use the arsenal we have in hand and must try to improve it. We are all safe if everyone, individually, is safe.

PHARMACEUTICAL INTERVENTIONS

Chloroquine - Hydrochloroquine: The administration of hydrochloroquine after exposure to the virus is not effective in preventing the onset of the disease. It also appears that COVID-19 treatment is not effective using this drug. Its administration to hospitalized patients did not reduce mortality.

Remdesivir: It has little or no effect on COVID-19 mortality. The same is true for Lopinavir and Ritonavir. However, combination therapy with lopinavir, ritonavir and ribavirin has some positive effects.

Dexamethasone: Its use in hospitalized patients reduces mortality in the group of patients treated in an intensive care unit. It also reduces by 35% the time required for the seriously ill to be supported by mechanical ventilation. Patients with severe COVID-19 infection receiving dexamethasone are 93% more

likely to have a better outcome.

Inhaled Budesonide: It seems to have some positive effect without significant side effects.

Plasma administration: Plasma administration from an already infected patient does not appear to have significant effects.

Azithromycin: It does not appear to reduce recovery time from illness or risk of hospitalization. It should not be used to treat diagnosed or expected COVID-19 infection. It does not reduce the possibility that the patient might require mechanical ventilation.

Doxycycline: It should not be used for either treatment or prevention of COVID-19 infection.

Interferons: They have little or no effect on the course of the disease.

Baricitinib + Remdesivir: Co-administration appears to reduce recovery time in patients with severe COVID-19 illness.

Colchicine: It does not seem to help significantly. A small study shows that it may reduce the time required for recovery. It also particularly reduces the oxygen therapy time of some critically ill patients.

Anticoagulants: Prophylactic use appears to reduce mortality in critically ill patients and does not increase bleeding episodes.

Vitamin D3: High doses do not appear to reduce hospitalization time. Still, it may have an immunostimulatory and anti-inflammatory effect and thus may have a positive effect overall.

There are many protocols that test different molecules such as AZD1656, Tradipitant, Opanagib, Aviptadil, NO, Razuprotanid. Apart from the various drugs, which, however, have a controversial effect, we have in our hands as effective weapons the adherence to personal sanitary protection measures and our participation in vaccination programs.

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