

# SARS Cov2 in Children

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## Virus Description

It is a general viral disease, which means that it can be transmitted from animal to human and *vice versa*, and this indicates that it is a virus that transcends different races and types of living organisms.

The disease is characterized by wide and different clinical symptoms from one patient to another, their severity and types depend on the type of organ or tissue that the virus infects and the physiological condition, age and immune status of the patient.

At the end of a year 2019, the Coronavirus infection spread very quickly in the suburbs of Wuhan china's city and infected large numbers of city dwellers, it was characterized by symptoms that differ from person to person in severity, nature and duration, which led to death in many cases of severe infection.

The rapid spread of the virus surprised researchers, doctors, the health community, and citizens in Wuhan and China in general Which provoked and instilled the spirit of challenge among scientists, researchers and those interested in health care in China to search and investigate the cause of all these infection and the rapid spread and deaths that occurred so quickly, finally that their investigation ended with the diagnosis of Corona virus (SARS cov2) as the cause of this pandemic that began in the Chinese city of Wuhan [1].

**Keywords:** SARS Cov2; Coronavirus; Children; COVID-19; Viral infection; Respiratory signs; Pfizer/BioNTech; Moderna and Johnson & Johnson vaccines

## COVID-19 Susceptible Age of Children

In December of the year 2019, a disease was announced in China that spread infection very quickly and caused deaths in different category of the Chinese people, and within these categories is children and adolescents, but with a lower rate than adults of both sex's men and women.

The available information about the patients' need for the necessary medicines to treat the disease and the special care that alleviate the clinical symptoms of the patients is still very limited due to the lack of extensive studies and full knowledge of the disease's secret and how to treat it in that time.

But the new COVID-19 or (SARS-CoV-2) has been proven to be responsible for 54,000 injuries and more than 1,200 deaths in various countries of the world in the year 2019, and information on the epidemiology of this disease so far has not been sufficient, as well as there are no comprehensive studies on clinical signs or behaviour in children are unclear and limited at yet [1,2].

The largest study so far, published in paediatrics J. included analysis of 2,143 children with COVID-19 documented from Jan 16 to Feb 8 in China. They found that the clinical symptoms of COVID-19 disease were less severe, shorter and less pronounced in children compared to the symptoms in adults. Specifically, 4.4 % of infected children had

no symptoms, 50.9% had showed mild disease and 38.8 % of infected children had moderate symptoms. While the study and investigation revealed that there is a 0.6% of children developed acute respiratory distress syndrome showed severe clinical signs with severe functional impairment of a number of organs.

Exposed to the disease compared while children under the age one year show severe symptoms of SARS Cov2 and there are 10% of them severely to 3% of teenagers over the age of 15 year [3].

## How Likely Are Children to Get Coronavirus Disease 2019 (COVID-19)?

Children are not look like adults in their sensitivity to infection with a COVID-19, and they rarely show serious and insignificant symptoms of the disease, although the disease has caused many outbreak infections around the world, but the number of children who died due to the SARS Cov2 are still very few or rare numbers.

According to the US Centers for Disease Control and Prevention (CDC), in the period between February 12 and April 2, of the nearly 150,000 COVID-19 cases in the United States, they found only 2500, or 1.7%, were children. This situation is similar to outbreaks that occurred in China and Italy. Also, the percentage of hospitalizations among children is much less than that of adults.

However, adults of all ages who suffer from associated chronic diseases (diabetes mellitus) have more severe life threatening infection by COVID-19.

In addition, children who suffer from heart disease and its congenital anomalies or genetic diseases or diseases that affect the nervous system or metabolic diseases pose a great danger to the lives of people infected with COVID-19.

We have to explain to those around us the seriousness of the disease when it affects a child or any adult suffering from a chronic primary disease, such as the above-mentioned diseases, and explain the impact and seriousness of the corona virus on these patients at any age.

### How Does COVID-19 Have an Effect on Kids?

Young children and adolescents may be infected with Corona virus, but some of them do not show symptoms or any signs of infection with the corona virus. But in general, the majority of them show mild signs of illness, including, for example, a mild to moderate fever, and mild fatigue with a cough. Some children have had marked fitness situations can be at expanded hazard for intense illness. Without a doubt, very dangerous consequences and symptoms may appear on some infected children. Severe cases like this are often called Multi-System Inflammatory Syndrome in Children (MIS-C), such situations can constitute a serious and severe life-threatening issues of children's lives, such as coronary heart disease, respiratory system diseases, or kidneys, the brain, skin, eyes, and even the systemic system in all its parts leading to very strong infections. Other children, regardless of age, with the following underlying medical conditions might also be at increased risk of severe illness compared to other children:

- » Asthma or chronic lung disease
- » Diabetes
- » Genetic, neurologic, or metabolic conditions
- » Sickle cell disease
- » Heart disease since birth
- » Immunosuppression (weakened immune system due to certain medical conditions or being on medications that weaken the immune system)
- » Medical complexity (children with multiple chronic conditions that affect many parts of the body, or are dependent on technology and other significant supports for daily life)
- » Obesity

### Symptoms of MIS-C Can Include

If your child has an underlying condition, make sure to discuss your child's potential for getting very sick with their healthcare provider. Symptoms of COVID-19 are similar in adults and children and can look like symptoms of other common illnesses such as colds, strep throat, or allergies. The most common symptoms of COVID-19 in children are fever and cough, but children may have any of these signs or symptoms of COVID-19:

- » Fever or chills (fever lasting more than a couple of days)
- » Cough
- » Nasal congestion or runny nose
- » New loss of taste or smell
- » Sore throat
- » Shortness of breath or difficulty breathing

- » Diarrhoea
- » Nausea or vomiting
- » Stomach-ache
- » Tiredness
- » Headache
- » Muscle or body aches
- » Poor appetite or poor feeding, especially in babies under 1 year old

### Why Do Children React Differently to COVID-19?

The answer to this question is not clear yet, but some scientists suggest that children do not become infected with Corona virus because they are infected with another corona virus, such as the severe common virus.

Let us take into consideration that children often get colds virus so that they have immunity that may protect them from infection with COVID-19, and the other reason that must be studied is perhaps the reaction of the immune system of children is different from the way the immune system of adults deals with SARS Cov2. When some adults are exposed to COVID-19, their immune system is severely affected by the severe immune response to infection, which leads to a strong inflammatory state that causes great damage to the body's organs and tissues, which may end with the death of the patient as a result of releasing large amounts of cytokines [1].

Often rare, because of the immaturity of their immune system and the small size of their respiratory system, infants of less than one year of age are often more sensitive and susceptible to severe respiratory viral infections.

In one of the China study between late December and early February, more than 2,100 children with suspected or confirmed COVID-19 in China were studied, and the results showed that less than 11% of infants had serious or severe illnesses.

In contrast, the studies showed that the prevalence of severe illness is nearly 7% for aged 1 to 5 years of children, and for children in 6 to 10 years old is about 4%, so it nearly 4% for children 11 to 15 years old, and 3% for children 16 years and older.

It must be noted that the infection of newborns with the COVID-19 virus often occurs during or after childbirth when they come into contact with health care providers or treating doctors when they are infected with the disease or are carriers of the virus. Therefore, the decision to separate the mother from the newborn fetus is considered a correct procedure taken by the American Academy of Pediatrics for those born to mothers with COVID-19 to reduce the transmission of infection to the child and to examine the child constantly to monitor whether he is infected or not.

### Do Children and Adults Have Different Symptoms of COVID-19?

When you notice that your son or child has started to have mild symptoms similar to those that appear COVID-19 here you have to make the quick decision to place your child in a special isolation room where all health conditions are available and prevent the rest of the family members from contacting him and inform the health authorities or the doctor supervising the symptoms that appeared on your son and then following the health procedures recommended by the World Health Organization and health authorities in your country.

Symptoms of SARS Cov2 in children and adolescents are often similar to the symptoms of the same disease in adults and tend in children to be mild and often unnoticeable, and if these symptoms are present, they may include coughing, a slight rise in body temperature, nasal discharge, muscle fatigue, vomiting and diarrhoea, which may persist these symptoms last for a few days in children [1,2].

Studies of American citizens which infected with COVID-19 indicated that young people under the age of 19 years showed very mild symptoms and no one of them were hospitalized, while 90% of the infected children showed mild to moderate symptoms, including fever, runny nose, cough, simple vomiting and diarrhoea.

Some children and adolescents have been admitted to the hospital due to childhood multiple system inflammatory syndrome (MIS-C) or pediatric multiple system inflammatory syndrome (PMIS) [2].

### Corona Virus in Sick Children if Some Children Have Other Diseases

In children who suffer from other diseases that exhaust the immune system, infection with COVID-19 will be more dangerous to the patient's life because the virus exacerbates and shows its ferocity as a result of the weakness of the immune system of these patients, especially when they have underlying diseases such as high blood pressure and kidney diseases that require dialysis that exhausts the immune system as well as diseases Cardiovascular and asthma. Doctors refer to some of the symptoms that appear on COVID-19 patients and confirm that the most important of these symptoms are fever, abdominal pain, vomiting, diarrhea and a rash. They are similar to toxic shock syndrome or Kawasaki disease, which causes inflammation of blood vessels in children. Serious problems are rare. If your child has any of the following symptoms, seek medical help immediately.

Among the serious problems or symptoms that appear on your child, for example, difficulty breathing, blue lips, difficulty awakening and confusion are a serious and rare sign, which requires you to immediately seek medical help and bring your child to the specialist doctors [1].

### When Will Youngsters be Capable of Get the COVID-19 vaccine?

Last past March of this year 2021, Pfizer/BioNTech and Moderna are found promising results in the third phase of its vaccine trial on adolescents and young teens whose ages range between 12 and 15 years, where experiments were conducted on 2,260 adolescent donors, and they were divided into two groups, the first group was given 50 % mRNA vaccine and the second group were given normal saline or placebo.

Among the plans developed by Johnson & Johnson is to do research on young ages, both children and adolescents in descending age, in order to expand them using the Pfizer/Biontech vaccine for adolescents under 16 years of age.

But currently, Johnson & Johnson and Moderna vaccines have authorized young people aged more than 18 years to use their vaccines,

while Pfizer Biotech has authorized adolescents aged 16 years to be vaccinated with its vaccine safely.

The researchers found the reaction and the immune response to the vaccine in adolescents under 16 years of age is much more than the immune response or the reaction that the ages of 18 to 25 years of age showed with the age of the study. They also found 18 cases of COVID-19 that showed clear symptoms in the experiment group that took the placebo [3].

Pfizer Bionic Corporation submitted its vaccine to the World Health Organization to obtain permission for emergency use authorization in children aged 12 to 15 years. After that, the company began testing its vaccine on children aged 12 years and over.

Moderna decided to conduct two studies, the first to try the vaccine on adolescents from the age of 12 to 17 years, and the second on children between the ages of 6 months to 12 years. Where experiments continue at age de-escalation research to ensure the safety of the vaccine and the degree of stimulus to the immune system of young children and adolescents.

In addition, they prefer to choose the safest and most reliable dose, and it should be effective and stimulate the immune system with few side effects that it causes to the person after vaccination [4].

The experiments that were conducted on adults are larger than the experiments that were conducted on children and young ages, as the experiments were conducted on 2000 to 3000 donors of different ages. Exactly as happened in studies on children, the people who took the placebo in adults were in small numbers compared to those who received the vaccine [5].

The FDA will evaluate facts from the de-escalation trials to determine whether or not to authorize the vaccines for every age category.

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