CURRENT STATUS OF CORONAVIRUS DISEASE IN CHILDREN /IRAQ (REVIEW ARTICLE)

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ABSTRACT

Coronavirus is starting in 2019 in Wuhan city-china. The cases increase in china and the rest world countries because of a high percentage of infections among the Chinese during the new festival. The World Health Organization named it coronavirus disease (COVID-19) and named the virus Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2), the disease-transmitting among the peoples. Many cases are detected in the pediatric age.

The coronavirus can affect any age, adults and children, women and men. Also, the studies found this disease affects even neonates, infants. The severity of clinical signs is depending on the child's immunity and health status. Limited data and few studies are done about transmitting route of the coronavirus in children.

Despite, the data for infected children with COVID-19 is few, the reports showed that the children suffering from the disease at a different level of severity. Found that the disease could be mild in children when comparing with the older ones because of the modification in the viral receptors.

The children with COVID-19 showed many hematological changes. One of the nine cases of children revealed lymphopenia and leukopenia, while another two children demonstrated increased lactate dehydrogenase, and all the nine cases have a high level of C-reactive protein and an increase in erythrocyte sedimentation rate

The treatment and management methods are developed, and we think these methods are very useful for children. But, the characteristics of children infection still don't clear yet. Some infected children were given antivirals, interferon, oseltamivir with mechanical ventilation. The antimalarial agent such as chloroquine phosphate showed high safety and efficacy in paints with COVID-19. In addition to that, the self-isolation of patients with COVID-19 and symptomatic treatment is very important for the treatment.

Our review is showing the new understanding of SARS-CoV-2 disease in children between (October-2020) to (April-2021).

Keywords: COVID-19, Coronavirus, Children and Adult.

Introduction

SARS-CoV-2 causes COVID-19 disease that confirms for the first time in Wuhan city, in China, in December 2019. Although making the efforts to control the disease, but, number of the infected cases

become (1.5) million cases and causes the death of (100,000) cases all over the world at the writing time of this paper. Mao et al. [1] found that SARS-CoV-2 has high penetration into CNS tissue (214) cases. Nearly, (36.4) % of the cases have nervous clinical signs that included headache, dizziness, and seizure, stroke, and loss of sense of taste or smell. The clinical signs of these cases have been related to the SARS-CoV-2 virus, and it still unknown. But, the dramatic neurologic clinical signs such as consciousness depressing, stroke, and seizure are common in the cases at final stages. There is a direct and strong relationship between the nervous clinical signs and the COVID-19 virus [2].

SARS-CoV-2 can get in by human angiotensin-converting enzyme-2 receptor which used by SARS CoV [3]. The neurons and the glial cells showed expression of ACE-2 receptors, therefore make it a target of COVID-19 infection that included that SARS CoV causes neuronal death through brain invasion after getting in by the olfactory epithelium tissue [4]. RT-PCR, immunohistochemistry, and electron microscopy can use for the diagnosis of the SARS-CoV in the neurological tissue [4] and the cerebrospinal fluid [5].

SARS-CoV-2 affects the brain after getting in the brain by the cribriform plate that results in changes in smell and sense. SARS-CoV-2 causes severe respiratory clinical signs in individuals (60) years and older as implications for Alzheimer's disease (AD) [6].

So, in the countries which have the virus, the scientific research that elated with Alzheimer's disease was stopped. The healthy quarantine of the elders is stopping the clinical studies. There is no doubt that Alzheimer's researches will continue soon. Therefore, pharmaceutical companies and Alzheimer's researchers should put the emergency plan to exit the chaos. The review showed some of the challenges fronts to dementia and Alzheimer's research during the COVID-19 outbreak and showed some suggestions.

Covid-19 in Children:

The children were rarely diagnosed at the starting of COVID-19's appearance and were thinking that children are less susceptible to disease (7).

A study by Wu and McGoogan2 used patients between (8-20) February 2020, only 1% of children and 1% of teenagers more than ten 10 years are affected in China. In another study, intensive care unit (ICU) in the USA found in March-2020 that deaths in individuals less than (19) years was (4226) cases by COVID-19. The study found that the risk of the disease increased in older age comparing with fewer ages and that is in close agreement with other reports (8).

The infected children are most close in direct contact with COVID-19 cases, the some of them travel or went to the epidemic area. The published studies in children with COVID-19 are shown in Table 1, and most of the cases from China before April 2020 (9-15), and only, one 3-month old infant in Vietnam (13).

Table 1 :- Shown The Case No In Some Counters

Country	Case No.	Age,y
china[17]	731	0-17
china[20]	171	0-15
china[19]	36	0-16
china[22]	25	0-14
china[18]	15	4-14
china[23]	8	0-15
vetnam[21]	1	0d
korea[5]	201	0-19
united states24	2572	0-17

Coronavirus Pathogenesis:

Coronavirus is part of the Coronaviridae family that is classified as RNA viruses with genomes and covered externally by spike proteins. The spike proteins make the virus get into the cells [16]. A study by "Hong et al" indicates that coronavirus is named SARS-CoV-2 and COVID-19 by WHO [17]. SARS-CoV-2 can invade the epithelial cell of the respiratory system, monocytes, and alveolar macrophages by ACE2 receptors that present on the cell surface [18, 19]. The average incubation period was three days (0-24) days [20].

Mode of Transmission:

WHO confirms the coronavirus can be spread by droplets from nose secretions, (saliva, sneeze secretion, and coughs) [21]. Infection Possibility is increased in the person who speaks loudly and or when rubbing the eyes by unclean hands [22]. In another study, the infection spreads by respiratory droplets and close contacts [23]. Recently, there is no study found a trans placental infection from the mother to infant [24]. The current review showed that the face and mouth is responsible for the transmission of the coronavirus in public [25].

Clinical Symptoms:

Clinical signs of coronavirus that associated with pneumonia vary from mild forms to the severe form. The most common clinical signs are included an increase in heart rate, narrowing of breath, dizziness, chest pain, sweating. Also, the patients with pneumonia showed acute respiratory syndrome [26]. The degree of the clinical signs is depending on the immunity response. The persons with immunity disorders or immunity diseases such as asthma and diabetes showed severe clinical signs as compared to healthy persons. Some persons showed clinical signs related to the gastrointestinal tract such as vomiting, nausea, diarrhea, discomfort, and abdominal pain [17].

Based on one study, the most common clinical signs in descending order were cough, fever, polypnea, constipation, fatigue, vomiting, nausea, and headache [27]. Some other patients have cyanosis, dyspnea, irritability, septic shock, restlessness, coagulation disorder, and metabolic acidosis [18].

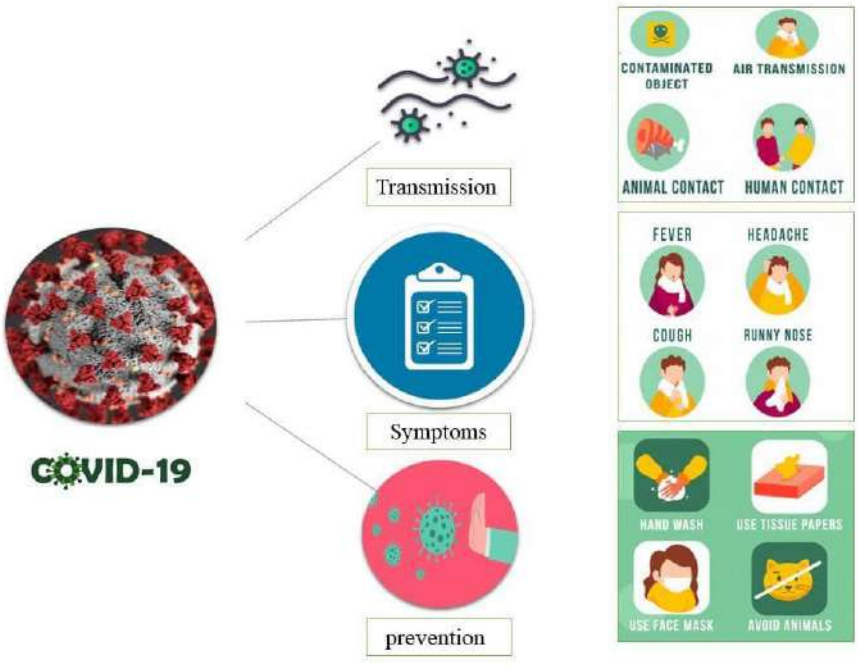

Figure 1: Shown The COVID -19 Transmission, Symptoms and Prevention.

Children Susceptibility to COVID-19:

The coronavirus can affect any age, adults and children, women and men. Also, the studies found this disease affects even neonates, infants, and younger. The severity of clinical signs is depending on the child's immunity and health status. Limited data and few studies are done about transmitting route of the coronavirus in children.

Chinese study is done on the first case of a child (one year) infected by COVID19, it included health level and immunizations play a great role in disease resistance, wherever the child showed diarrhea, fever, vomiting, acute respiratory distress, shortness of breath, septic shock and renal failure [28]. In another study discussed baby (55) day infected and showed failure in many organs [29]. There are data showed nearly (90) % of children are infected at different degrees nut few cases need hospitalizations [30].

On another side, several studies find out sources of infection in children. The data were taken from (9) infants infected and reside in the hospitals in China, and they showed that infected family members living together and maybe indicated to infection source because the babies cannot wear masks, but no one needs to the mechanical ventilation [31]. Furthermore, two cases of infected children in the same family have mild clinical signs [32]. Iranian study found that infected children have an infection history of their family [33]. In Asia again, in Korea, the first child showed mild infection at (10) year and have direct contact with him infected family [34].

Other studies suggested that the infected children have a mild form and good prognosis and the most common cure spontaneously. There is no evidence to confirm that transplacental transmission of infection is true, about (230) neonates infected. Some studies suggested that children have limited contact with the around the world when compared with adults [35]. Therefore, they showed little risk of infection [36]. Some studies revealed that the children have limited exposure to the external world, but they are still at risk infection source.

Radiological and Laboratory Findings:

The children with COVID-19 showed many hematological changes. One of the nine cases of children revealed lymphopenia and leukopenia, while another two children demonstrated increased lactate dehydrogenase, and all the nine cases have a high level of C-reactive protein and an increase in erythrocyte sedimentation rate [34].

An additional cases of children with COVID-19 demonstrated normal hematological values, but they showed pathological modifications on chest radiograph (patchy infiltration) [37]. Only, a single study revealed that children with a severe form of infection have progressive lymphocytopenia with pathological alterations in radiography. In addition to that, they revealed pleural effusion, lung consolidations, and bilateral ground-glass opacity by using CT scanning [22].

In a study that used infected children with COVID-19 (10) months to (6) years, the study revealed only (3) children have ground-glass opacities. On cases of boys in Singapore (6) months showed positive result by RT-PCR, neutropenia, high viral load [38].

In Korea, the CT scanning of the girl (10) year showed mild clinical signs that included peripheral ground-glass opacities and nodular consolidations in the lower lobe on the right lung [34]. Few patients revealed increased procalcitonin concentration [39].

A study in China demonstrated the increased concentration of muscle enzymes, procalcitonin, transaminase, CRP, ESR, and CRP in nine children, and the CT chest findings showed the outer and middle zone of the lungs (40).

COVID19 in Children and Adults:

COVID-19 disease is the effect all ages. Despite, the data for infected children with COVID-19 is few, the reports showed that the children suffering from the disease at a different level of severity. Some studies found that the disease could be mild in children when comparing with the older ones because of the variance in the viral receptors [35].

Also, there is another difference are done (13) infected child showed typical clinical signs by using CT. the consolidations and halo sign are the main findings of the disease [39].

Treatment Modalities:

COVID-19 treatment is still unknown and no there medicines or vaccines yet. From many reports, the antibacterial, antivirals, antimalarial and immunoglobulins, oxygenation with mechanical ventilation are useful for infected children. A study on newborns included that administration nitric oxide, pulmonary surfactant, and ventilation is giving good results . The 9 children from Iranian with COVID-19 showed improvement by helpful care without mechanical ventilation and the ribavirin [33].

Some infected children were given antivirals, interferon, oseltamivir with mechanical ventilation [27]. The antimalarial agent such as chloroquine phosphate showed high safety and efficacy in paints with COVID-19 [41]. In addition to that, the self-isolation of patients with COVID-19 and symptomatic treatment is very important for the treatment.

Management:

Our reports focusing on children with COVID-19, the studies and reports that handle this subject is very few and limited. Many studies carried out in China are not translated into English that forms difficulty in our efforts to study these subjects. The main aim of this review was to determine the impact of COVID-19 on children. Although the limited information, our study found that none infected children, be able to carriers of the virus and that have a great role in increasing the disease. The severity degree of the clinical signs of the infected children is different and contract. So, studies are needed to other enough data to produce a better and best treatment of this disease.

The children have limited exposure to this virus to the external. The disease could contract among the family members. Therefore, our purpose is to forming lay emphasis and awareness for preventing the infection.

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