

COVID in Pediatrics and its impact in Venezuela

Huníades Urbina-Medina*

President of Venezuelan Pediatric and Child Care Society, Pediatrician - Pediatric Intensive Care Specialist, Hospital de Niños JM de los Ríos, Venezuela

***Corresponding Author:** Huníades Urbina-Medina, President of Venezuelan Pediatric and Child Care Society, Pediatrician - Pediatric Intensive Care Specialist, Hospital de Niños JM de los Ríos, Venezuela.

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The first studies published with pediatric cases from China corroborate the impression that children are not as seriously affected as some adult patients. At the same time, children with comorbidities are vulnerable to SARS-CoV-2 infection. The reason why most COVID-19 cases in children are less severe than adults is puzzling. This can be related to both exposure and host factors. Children are generally at home and may have relatively fewer opportunities to be exposed to the pathogen and/or sick patients. New and unusual clinical presentations are becoming evident, such as multisystemic inflammatory syndrome in children, where the clinical picture may resemble Kawasaki disease and/or toxic shock. The child, being asymptomatic or having non-specific signs or symptoms, is an entity that facilitates person-to-person contagion. In addition, prevention measures such as the use of masks cannot be applied, especially in children under 1 year of age, plus the fact they can eliminate the virus through the fecal route up to 2 weeks after its presence in the respiratory tract has become negative, which makes the child, especially the infant, a propagator of the disease. Venezuelan situation and specially that of children in general, is much more worrying since, the collapse in health and economics that Venezuela has been through even before the pandemic, social inequalities, the difficulty accessing to health system, the restriction of mobility and scarcity of fuel, limits the diminished population vaccination program, the closure of schools that affects children and especially girls.

The first studies published with pediatric cases from China corroborate the impression that children are not as seriously affected as some adult patients. COVID-19 was predominantly more prevalent among adults over 15 years of age in the early stages

of the outbreak, and the proportion of confirmed cases among children was relatively low. However, due to the increasing global spread of SARS-CoV-2, we have new challenges for the prevention and control of the COVID-19 epidemic among children. Since prevention measures (masks) cannot be used in the smallest, the non-specific symptoms they present, difficulties of diagnosis, poor communication between doctor-patient and family, all have contributed to the challenge of developing measures to protect this population, as well as health personnel who handle pediatric cases. At the same time, children with comorbidities are vulnerable to SARS-CoV-2 infection [1].

Countries try to “modulate” in part the natural evolution of the new coronavirus, with greater or lesser success, through empirical measures of social isolation, border closures, schools, commerce, extensive and/or dynamic quarantines, which have come to transform abruptly our habits, ways of relating to each other and generating an important health, social, mental, political and economic impact in the short and long term. The reason why most COVID-19 cases in children are less severe than adults is puzzling. This can be related to both exposure and host factors. Children are generally at home and may have relatively fewer opportunities to be exposed to the pathogen and/or sick patients. On the other hand, in relation to the SARS CoV-2 cellular receptor angiotensin-converting enzyme 2 (ACE2), it is speculated that children are less sensitive to SARS CoV-2 due to maturity and function, for example, the ability to ACE2 binding in children may be lower than in adults [2,3]. It has recently been reported that children under 10 years of age have significantly lower expression of angiotensin converting enzyme 2 (ACE2), the receptor that SARS-CoV-2 uses for its entry into the cell, compared

to older subjects, 10 years old, in whom ACE2 expression gradually increases with age [4].

New and unusual clinical presentations are becoming evident, such as multisystemic inflammatory syndrome in children, where the clinical picture may resemble Kawasaki disease and/or toxic shock. Fortunately, very few cases have been reported and seems to be associated with a rather post-infectious immunological condition. The drop in vaccine coverage of the Immunization Programs of the countries of the Americas region is worrying, especially in Venezuela, where vaccine coverage is among the lowest according to the WHO5. We have the responsibility to protect and promote the vaccination of children in times of pandemic, ensuring access, protection measures and continuities of the programs, in order to avoid the appearance of outbreaks of vaccine-preventable diseases (such as measles, meningococcus or diphtheria), as well as the deterioration of chronic disease patients due to insufficient health control [4].

Another considered alternative is that children often experience respiratory infections (for example, RSV) in winter and may have higher levels of antibodies to viruses than adults. Also, children's immune system is still developing and may respond to pathogens differently than adults. However, the results of the study by Dong Yo., *et al.* found a higher proportion of severe cases at a younger age: 10.6% in children under 1 year old; 7.3% from 1 to 5 years; 4.2% from 6 to 10 years; 4.1% from 11 to 15 years and 3.0% for 15 years; suggesting that young children, especially infants, are more vulnerable to SARS CoV-2 infection [3,4].

The child, being asymptomatic or having non-specific signs or symptoms, is an entity that facilitates person-to-person contagion; in addition, prevention measures such as the use of masks not recommended under 1 year of age, being able to eliminate the virus through the fecal route up to 2 weeks after the presence of it in the respiratory tract has become negative, makes the child, especially the infant, a propagator of the disease [5].

Although since the beginning of the pandemic and the data offered by the reports of the casuistry and statistics from both China and the United States, indicate that the affectation, signs and symptoms of large percentage of patients in pediatric age is mild and with a low fatality rate compared to the adult and elderly population. Similar to the adult population, those patients with some

underlying chronic condition (especially pulmonary) are more susceptible to presenting a more serious condition that requires hospitalization. A lower percentage (0.5 - 2%) may require intensive care [6,7].

In Venezuela, according to official information issued by the Popular Ministry for Health (MPPS), in the September 16, 2020 bulletin, the behavior of the pandemic has been: Positive cases: 62,655, distributed in the pediatric range of 0 - 9 years: 707 cases and 10 - 19: 878, for a total of 1585 cases, which is equivalent to 2.5% of the positive cases. 502 deceased, however this number is not discriminated by age [8].

The National Academy of Medicine and especially the Venezuelan Society of Pediatrics has made recommendations on child health to government institutions responsible on this matter, such as:

- Not to hospitalize asymptomatic patients.
- Increase the number of PCR tests/million inhabitants.
- Carry out massive information campaigns about COVID-19.
- Distribute masks for free in places of high concentration such as the underground system stations: Metro de Caracas and land passenger terminals.
- Make isolation measures more flexible for children accompanied by their parents or guardians.
- In the full expansion phase of COVID-19 we do not recommend the start of face-to-face classes.
- Improve internet service in Venezuela, which is one of the slowest in the region.
- Provide teachers and students with computer systems to carry out virtual education, since more than 60% of the population does not have computers or home internet system.
- Increase vaccination coverage in pediatric age.
- Adhere to the WHO/PAHO recommendations regarding the treatment of suspected patients or carriers of SARS-Cov-2.
- Avoid advertisements to the population about natural medicines with the false promise of cure and others not authorized by international organizations such as Chlorine Dioxide.
- Provide all health personnel with EPPI equipment and other materials necessary for the containment and prevention of the disease, given the high mortality rate of health personnel, especially doctors.

Recommendations that have not been heard and much less put into practice by the National Government. The effects of the pandemic in the medium and long term will make Venezuela, like the rest of the countries, facing new socioeconomic scenarios, with an increase in unemployment and poverty figures that can generate epigenetic changes in childhood, with an increase in malnutrition figures, psychological and psychiatric disorders and infectious diseases. The results of the Venezuelan survey of living conditions (ENCOVI) 2019 - 2020 on the nutritional situation of children under 5 years of age, according to the weight-age indicator, reveals that around 21% are at risk of malnutrition and 8% are malnourished, a level considerably distant from the registry in Colombia (3.4%), Peru (3.2%) or Chile (0.5%). Likewise, according to the height-age indicator, 30% have been estimated to be chronically malnourished. Likewise, according to the height-age indicator, 30% have been estimated to be chronically malnourished 9. All these values, according to the projections of nutrition experts will rise due to, among other things, the difficulty of acquiring food during the pandemic, since the restricted mobility imposed as a containment measure for SARS-Cov-2 worsened by the fuel shortage that limits food transport to the populated areas from the Venezuelan countryside and the hyperinflation still escalating in Venezuela, makes it almost impossible to acquire the basic food basket for a family with the minimum wages earned in the country, as of September 27th, the date of writing of this document, is equivalent to 400,000 bolivars, and according to the official exchange rate of the Central Bank of Venezuela (BCV) is equivalent to \$ 1.09 per month [10].

Social and economic conditions, and their effects on the life of the population, determine the risk of becoming ill and the measures that are adopted to prevent it or to treat it. The poorest of the poor throughout the world, are also the worst in health. Within countries, data show that in general the lower a person's socioeconomic status, the poorer its health. Beside this, Venezuelan situation and particularly that of children in general, is much more worrying since the collapse in health and economics that the country suffered prior to the pandemic, social inequalities, the difficulty of accessing the health system, restrictions in mobility and fuel scarcity, limits the diminished population vaccination program, and schools closure affects children especially girls [11].

Venezuela presents limitations in the capacity of the health system to face a serious situation of cases of the COVID-19 pandemic,

due to the shortage of necessary items, failures in water supply, sanitation and hygiene service in health facilities, reduced ability to prevent and control infections, and lack of specialized human resources for the attention of complicated cases. These limitations are an obstacle to prevent the spread of COVID-19. In these circumstances, the affected people will resort more frequently to negative survival strategies, such as reducing food intake, selling goods and/or debt, particularly in the most vulnerable groups, such as women and adolescents who are heads of household, engaged in the informal economy. All these factors may contribute to increase the risk of getting COVID-19 [11].

As the pandemic spreads in the region, its characterization as a health, economic and social crisis has become evident. The size and duration of its effects, although difficult to quantify due to uncertainty, are beginning to be clearly perceived. It will be the cause of the greatest economic and social crisis in the region in decades, with very negative effects on employment, the fight against poverty and the reduction of inequality. Sizing the decline in economic activity allows us to begin to determine the magnitude of the effort for a return to get back to normal. But that return will not be and should not be a return to the situation that existed before the pandemic. From the conjunction of short-term quantitative estimates and forecasts of the main medium-term qualitative changes, what will be a new normal will emerge.

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