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COVID-19 in the Pediatric Population

Patricia A. McQuilkin

University of Massachusetts Medical School

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COVID-19 in the Pediatric Population



Wuhan Study January & February 2020

- Largest cohort of children studied to date (2143)
- Patients divided into categories based on severity and progression of symptoms:
 - Asymptomatic: picked up by screening with no symptoms
 - Mild Disease: symptoms of acute upper respiratory tract infection, including fever, fatigue, myalgia, cough, sore throat, runny nose, and sneezing. Physical examination shows congestion of the pharynx and no auscultatory abnormalities. Some cases may have no fever, or have only digestive symptoms such as nausea, vomiting, abdominal pain and diarrhea.
 - Moderate Disease: with pneumonia, frequent fever and cough, mostly dry cough, followed by productive cough , some may have wheezing, but no obvious hypoxemia such as shortness of breath
 - *Severe Disease: Early respiratory symptoms such as fever and cough, may be accompanied by gastrointestinal symptoms such as diarrhea. The disease usually progresses around 1 week, and dyspnea occurs, with central cyanosis. Oxygen saturation is less than 92%, with other hypoxia manifestation
 - *Critical: Children can quickly progress to acute respiratory distress syndrome (ARDS) or respiratory failure, and may also have shock, encephalopathy, myocardial injury or heart failure, coagulation dysfunction, and acute kidney injury. Organ dysfunction can be life threatening.
- * Require Hospitalization

Dona, Y., Mo, X., Hu, Y, et al, Epidemiology and characteristics of 2143 pediatric patients with Coronavirus Disease in China (2020) *Pediatrics*

Wuhan Study

Table 1 Characteristics of Children' COVID-19 Cases in China

Characteristics	All cases	Different Category		
		Confirmed	Suspected	<i>P</i> Value
Median age (Interquartile range)	7.00 (11.0)	10.00(11.0)	6.00(10.0)	<0.001
Age group				
<1	379(17.7)	86(11.8)	293(20.8)	
1-5	493(23.0)	137(18.7)	356(25.2)	
6-10	523(24.4)	171(23.4)	352(24.9)	<0.001
11-15	413(19.3)	180(24.6)	233(16.5)	
>15	335(15.6)	157(21.5)	178(12.6)	
Gender				
Boy	1213(56.6)	420(57.5)	793(56.2)	0.567
Girl	930(43.4)	311(42.5)	619(43.8)	
Severity of illness				
Asymptomatic	94(4.4)	94(12.9)	0(0.0)	
Mild	1091(50.9)	315(43.1)	776(54.9)	
Moderate	831(38.8)	300(41.0)	531(37.6)	
Severe	112(5.2)	18(2.5)	94(6.7)	<0.001
Critical	13(0.6)	3(0.4)	10(0.7)	
Missing	2(0.1)	1(0.1)	1(0.1)	
Days from symptom onset to diagnosis				
Median days (Interquartile range)	2(4.0)	3(4.0)	2(4.0)	<0.001
Range	0-42	0-42	0-36	
Province				
Hubei	984(45.9)	229(31.3)	755(53.5)	
Surrounding areas*	397(18.5)	155(21.2)	242(17.1)	<0.001
Others	762(35.6)	347(47.5)	415(29.4)	
Total	2143	731(34.1)	1412(65.9)	

Data are presented with median (Interquartile range) and n (%).

*Surrounding areas are the provinces and Municipality bordering Hubei, they are Anhui, Henan, Hunan, Jiangxi, Shaanxi and Chongqing.

Table 2 Different Severity of Illness by Age Group

Age group*	Asymptomatic	Mild	Moderate	Severe	Critical	Total
<1	7(7.4)	205(18.8)	127(15.3)	33(29.5)	7(53.8)	379(17.7)
1-5	15(16.0)	245(22.5)	197(23.7)	34(30.4)	2(15.4)	493(23.0)
6-10	30(31.9)	278(25.5)	191(23.0)	22(19.6)	0(0)	521(24.3)
11-15	27(28.7)	199(18.2)	170(20.5)	14(12.5)	3(23.1)	413(19.3)
>15	15(16.0)	164(15.0)	146(17.5)	9(8.0)	1(7.7)	335(15.7)
Total	94	1091	831	112	13	2141(100)

Data were presented with number and percent (%);*Two cases had missing values.

Wuhan Study

Conclusions:

- All ages are susceptible to COVID-19
- Children may have GI symptoms (diarrhea, vomiting, abdominal pain), in addition to respiratory symptoms
- Majority of pediatric patients (94%) were in the asymptomatic, mild or moderate categories (no hospitalization); Of those with severe or critical disease over 50% were under 12 mos.
- Majority of children recover after 1-2 weeks
- Infants (<1 year) are vulnerable and susceptible to severe disease
- Children can serve as asymptomatic vectors who quietly harbor community spread

Why are
children only
mildly
affected?

- Case reports of newborns with high viral loads of COVID-19 but are clinically asymptomatic
- Theories:
 - Young children are developing immunity to many different viruses, and thus have high levels of antibodies that cross-react with COVID-19
 - Young children have something fundamentally different about their immune system that allows them to mount a more robust immune response to COVID-19

Clinical Management of Children with COVID- 19:

- No clinical management guidelines established yet; They will be forthcoming as we study more patients
- Patients at risk for severe disease:
 - Children under 12 months of age
 - Children with asthma and other chronic underlying diseases (cardiac disease, diabetes)
 - Children who are immunosuppressed (HIV, TB, malnutrition)

Clinical Management of Children with COVID-19:

Some clinical issues that have been raised in the U.S.

- Steroids: **not indicated** at this time for children
- Albuterol: Helpful for patients with asthma; **Metered dose inhalers** should be used instead of nebulizers in COVID19 positive patients, to minimize aerosolized spread of virus
- Ibuprofen : Reports of association of more severe disease in children who used ibuprofen- these reports **have not been supported** by WHO or FDA
- Chloroquine/ azithromycin: Reports of clinical improvement in patients taking this combination of antibiotics – **These finding not supported by evidence and could be dangerous to patients with prolonged QT syndrome**

Prevention of spread:



Social Distancing:



The Creation....of Hand Sanitizer



Thanks!!