



Clinical Characteristics of Pediatric SARS-CoV-2 Infection and Coronavirus Disease 2019 (COVID-19) in Kuwait

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Background

- SARS-CoV-2 has caused a pandemic of respiratory illness associated with relatively high morbidity and mortality.
- Children are believed to have less severe diseases when compared to adults.
- First pediatric case in Kuwait was identified on Feb 29th, 2020. Since then and until April 30th, all pediatric cases, regardless of symptoms, were admitted to one hospital. Pediatric cases were identified by active case finding: close contacts investigation, returning travelers, and symptomatic children.

Objectives

- Evaluate pediatric COVID-19 characteristics and duration of viral shedding measured by RT-PCR.
- Identify the predictors for symptomatic pediatric COVID-19 cases

Methods

Study design and population:

A single-center retrospective cohort study was performed at Jaber Alahmad Hospital (JAH) from Feb 29th to April 30th, 2020. All PCR-confirmed pediatric SARS-CoV-2 infections from 1 month to 18 years old were included. During the study period, all patients, regardless of symptoms were evaluated on a daily basis by a pediatrician, and vitals were checked at least 3 times daily.

Data collection:

Patient charts were reviewed to collect data on patient demographics, significant underlying co-morbidities, laboratory investigations, and medical management. Daily symptoms as reported in the admission and progress notes were recorded.

Sample processing and definitions:

Nasopharyngeal specimens were collected using Xpert Nasopharyngeal sample collection kit (Cepheid, CA, USA), and oropharyngeal swabs used were Transystem 139C (COPAN Italia Brescia, Italy). Upper respiratory specimens were first repeated after 12 days of admission. Then, it was repeated after 24 hours if the result was negative, or every three days if it was positive. Nucleic acid extraction and RT-PCR were performed and cycle threshold (Ct) value for E and RdRP genes were measured using Tib MolBiol's LightMix (Roche™ Basel, Switzerland).

Data analysis

Descriptive statistics were performed and differences between the asymptomatic and the symptomatic patients were analyzed using Fisher's exact test for categorical variables and Mann-Whitney U test for continuous variables. Kaplan-Meier method was used to assess duration to negative RT-PCR and log-rank test was performed to compare different clinical patient groups.

Results

- Among 134 pediatric SARS-CoV-2 infection cases that were identified, 68% of the patients were asymptomatic
- 43 cases had mild illness, with or without pneumonia. Three of the patients were presymptomatic on admission

Figure 1: Number of patients identified during the study period

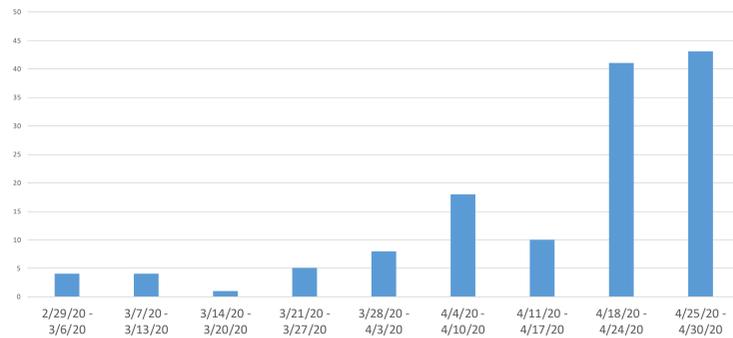
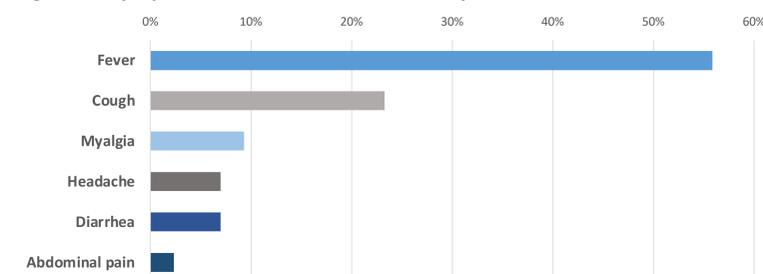


Table 1: Demographic and clinical characteristics of the study population

	Asymptomatic (n= 91)	Mild Disease (n= 43)	p-value
Age (median, IQR)	9.11 (5-9.11)	7.5 (1.7-7.5)	0.329
Less than 1 year	2 (2.2%)	6 (13.9%)	0.065
Male	52 (57.1%)	22 (51.2%)	0.516
Source of Exposure			
Travel-related	19 (20.9%)	0	0.001
Close contact	70 (76.9%)	41 (95.3%)	
unknown	2 (2.2%)	2 (4.7%)	
Fully Vaccinated (n= 99)	54 (85.7%)	34 (94.4%)	0.319
Comorbidities			
Asthma	3 (3.3)	0	0.551
Prematurity	3 (3.3%)	1 (2.3%)	1
Type 1 Diabetes	1 (1.1%)	0	1
Malignancy	1 (1.1%)	0	1
Epilepsy	1 (1.1%)	1 (2.3%)	0.540
Congenital heart	1 (1.1%)	3 (7%)	0.098

Figure 2: Symptoms distribution of the study cohort

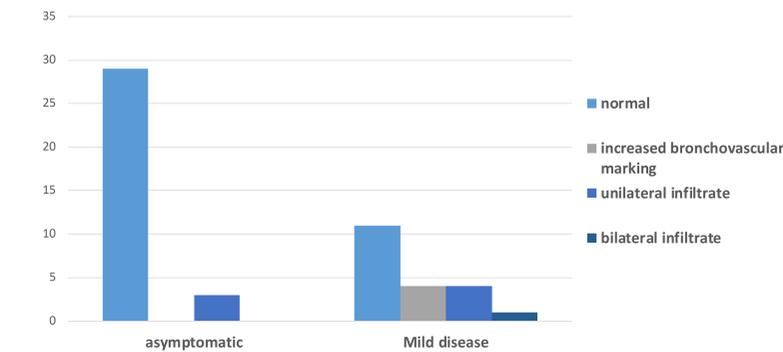


Results

Table 2: Laboratory investigation done at hospital admission

	Asymptomatic (n= 91)	Mild Disease (n= 43)	p-value
WBC (n= 128) (median, IQR)	7.7 (6-9)	7.1 (5.3-9.5)	0.621
Lymphopenia (n, %)	5 (5.8%)	6 (14%)	0.597
Neutropenia (n, %)	7 (8.2%)	7 (16.2%)	0.224
Elevated CRP (n, %)	2 (3.8%)	7 (26.9%)	0.005
Elevated PCT (n, %)	3 (4.6%)	7 (20.6%)	0.029
Coagulation Profile (n=77)			
INR (median, IQR)	0.99 (0.94-0.99)	0.96 (0.92-0.96)	0.173
PT (median, IQR)	13 (12.6-13)	13 (12.4-13)	0.958
aPTT (median, IQR)	31.9 (30-31.9)	31.5 (29.4-31.5)	0.503
Liver Enzymes			
ALK, (n= 128) (median, IQR)	196 (147-196)	169 (142-169)	0.215
ALT, (n= 126) (median, IQR)	16 (13-16)	16 (13-161)	0.878
AST, (n= 122) (median, IQR)	27 (20-27)	24 (20-24)	0.766
Albumin (n= 129) (median, IQR)	41 (38-41)	40 (38-40)	0.762
Creatinine (n=127) (median, IQR)	37 (30-37)	37 (27-37)	0.657

Figure 3: Distribution of chest radiograph findings among patients



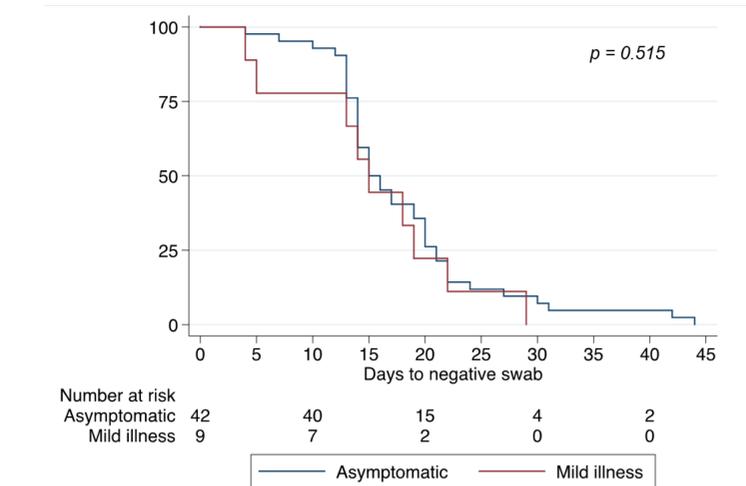
- 11 patients received antibiotics, and only one patient had microbiologically-confirmed bacterial infection (urine culture grew *K. pneumoniae*).
- One asymptomatic patient with abnormal CXR received a course of antibiotics (ceftriaxone).

Table 3: Predictors of symptomatic infection

Variable	OR	95% CI
Elevated CRP	9.4	1.8 – 49.2
Elevated PCT	5.3	1.3 – 22.3
Abnormal Chest X-ray	7.9	1.8 – 34.7

Results

Figure 3: Kaplan-Meier estimates of proportion positive RT-PCR from upper respiratory specimen



Conclusion

- Laboratory factors that were associated with symptomatic COVID-19 were high CRP, high PCT, and abnormal chest radiograph.
- Viral shedding as detected by RT-PCR did not differ according to symptoms, lasting for a median of 15.5 and 15 days in asymptomatic and symptomatic children, respectively.
- During in-hospital follow-up of a median of 14 days, two-thirds of patients were asymptomatic and none required respiratory support

Ethical consideration

This study was approved by the ethics committee of the Ministry of Health in Kuwait (reference no. 2020/1452).

Contact information

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