




Assessing the clinical manifestations, laboratory and radiological findings of hospitalization of pediatrics patients with COVID-19 in pediatric Hospital of Amirkola, Babol

Mohsen Mohammadi ¹, Parisa Ebrahimzade mojavari ^{2*}, Farzin Sadeghi ³, Abazar Pournajaf ⁴, Ali Mohammadpour Mir ¹, Hanie Esfandiar ¹, Rahmatollah Najafi ¹

¹. Assistant Professor of Infectious Disease, Non-Communicable Pediatric Disease Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran,

². MSc in Microbiology, Non-Communicable Pediatric Disease Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, IR Iran.

³. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

⁴. Department of microbiology, faculty of medicine Babol university of Medical Sciences, Babol, Iran

Article Info

Article type:

Research Article

**Received: 27 March
2022**

Revised: 17 May 2022

**Accepted: 20 June
2022**

ABSTRACT

Background and Objective: Variant Omicron was discovered as a newest severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first emergence of the omicron variant was detected in November 2021. In this study, we investigated the clinical manifestation, laboratory and radiological findings and responding to treatment of 70 pediatric patients with positive RT-PCR COVID-19 in Omicron peak. We described 20 criteria associated with efficacy, such as demographic data, clinical manifestation, laboratory and radiological findings. All of the patients received Remdesivir that 5.7% of patients responded to the treatment. No patients were given Intravenous Immunoglobulin (IVIG). This is the first study aimed at assessing symptoms clinical manifestation among hospitalization pediatrics patients in pediatric Hospital of Amir kola, Babol. The findings of this study can be effective in preventing and controlling disease transmission among children.

Keywords: Covid-19, Omicron variant, Pediatrics, Real time PCR

Cite this article : Mohammadi, et al. Assessing clinical manifestations of hospitalization of pediatrics patients with COVID-19. *Current Research in Medical Sciences*. 2022; Vol. (5.3): pages.1-6



© The Author(s).

Publisher: Babol University of Medical Sciences

Introduction

Coronavirus disease is a zoonotic virus, first emerged from December 2019 in Wuhan, china (1). Up to now, several variants of SARS Cov-2 were discovered. The first case of covid-19 in children was reported from Shanghai china. This is a 7-years-old boy who admitted to hospital because of fever (2). The most recent identification of the variant of SARS Cov-2 was discovered omicron in Botswana in early November (3). SARS COV-2 (Sever acute respiratory syndrome coronavirus-2) infection rapidly spreading in worldwide and led to life threatening disease among children and adults (1, 4). Varied clinical presentations are reported but lung involvement with sever acute respiratory is the most important

*Corresponding Author: Parisa Ebrahimzade mojavari

manifestation (5). Some studies described complications like Kawasaki's disease, toxic shock syndrome in children (4). The most important role to reduce of morbidity rate of disease is notice to clinical course, treatment. It is reported that there is an association between individual characteristics and severity of disease (6).

Since limited data is available about the Omicron infection particularly in pediatric, the objective of this study investigates of clinical manifestation of disease by Omicron variant among hospitalization pediatrics with serious disease Cause in pediatric Hospital of Amir kola, Babol.

Methods

This Cross-sectional descriptive study was conducted in pediatric hospital of Amirkola, Babol. 70 hospitalization pediatrics patients with covid-19 participated in our study. The age of participants ranges from less than 1 year to more than 1 year with positive RT-PCR covid-19 by a throat swab test in Omicron Peak between December 2021 and 20 March 2022.

We collected data on demographic, Clinical manifestation, laboratory and radiological findings and also responding to treatment from medical records of hospitalization patients. This study was confirmed by the ethics committees of Babol University of medical sciences. Statistical analysis of the study participants was implemented using SPSS (Statistical Packages for the Social Sciences) version 16.0 (SPSS Inc).

Results

70 hospitalization pediatrics patients with positive Covid-19 participated in this study, among them, 40 (62.95) were male. The age range of participants was from less than 1 year to more than 1 year. In our study fever (n= 59, 84.3%), cough (n= 38, 54.3%), vomiting (n=30, 42.9%), diarrhea (n= 12, 17.1%), decreased appetite (n=12, 17.1) were detected as the most clinical manifestations (Table 1).

Additionally, anemia (n=48, 68.6%), thrombocytopenia (n=10, 14.3%), hyponatremia (n= 57, 81.4%), C-reactive protein (CRP) values (n=18, 25.7%) were reported the most frequent laboratory abnormalities among participants. Leucopenia and leukocytosis were detected in 6 (8.6%) and 7(10.0%) of patients respectively. Calcium and potassium were reported normal in 44(62.9%) and 57(81.4%) of patients and Hypocalcemia and Hypercalcemia were reported among 8(11.4%) and 5(7.1%) of pediatrics hospitalizations and also hypopotassemia and hyperpotassemia were demonstrated in 3 (4.3%) and 5 (7.1%) of pediatrics hospitalizations respectively (table 2).

All hospitalization patients were received chest- x- ray and lung CT scan. Pulmonary findings in chest- x- ray positive among 8 (11.4%) of patients and Pulmonary findings in lung CT images were demonstrated in 4 (5.7%) of patients.

50 (71.4%) patients were given antibiotics treatment. in additional, all of the patients were received Remedisivir and no one were received Intravenous Immunoglobulin Therapy (IVIG). Among patients who received Remedisivir, 4 (5.7%) patients responded to treatment.

Conclusion

Variant Omicron was discovered as a newest severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (7). The first emergence of the omicron variant was detected in November 2021(8). In this study, we reported the main clinical manifestation, laboratory and radiological findings and treatment of hospitalization pediatrics patients who involvement due to Covid-19 in Omicron peak. We demonstrated

that the most significant manifestation in pediatrics were included fever and cough. In addition the main gastrointestinal symptoms were vomiting and diarrhea. It was consistent with the systematic review by Yasuhara et al findings showing the main clinical manifestation were including fever and cough (9). There were no observed sever of disease or deaths. Similarly, Li Zhu et al reported no patients had severd complications and no one admitted to ICU. (6) Some studies regarding to covid-19 among children have been reported that clinical symptoms are milder than adults. In generally, clinical course in pediatric no reported of severe complications (10-12).

In present study all patients with Covid-19 were given Remedisivir that only 5.7% of them were treated and no one were received Intravenous Immunoglobulin (IVIG). According to Previous studies, Remdesivir mitigated and declined mild symptoms SARS-CoV-2 infected (13). Several studies have been reported antiviral drugs are effective for Delta variant or other variants. But our findings about the efficacy antiviral drugs against Covid-19 is not sufficient and it needs to more studies (3).

In our study, the most frequent laboratory findings were described such as anemia, thrombocytopenia, hyponatremia, C-reactive protein (CRP) values among participants. Some of our laboratory findings are opposite to another studies It can be related to being different in sample size (6).

In our analysis, we have been reported the main radiological traits in pediatrics with Covid-19. These findings were consistent/ inconsistent to a systematic review that was performed in this field (9).

In conclusion, this is the first study describing Covid-19 in Omicron peak among hospitalization pediatrics with covid-19. knowing clinical manifestations of children with covid-19 conceiving of the role of pediatric patient population in transmission, subsequently prevention of becoming infected is so important to control the spread of infection and epidemic among children during outbreak of covid-19 or respiratory tract infection.

Variables	Total (n=70)
Age	
<1	17 (24.3%)
>1	53 (75.7%)
Female	30 (42.9%)
Male	40 (57.1%)
Fever	59 (84.3%)
Runny. nose	16 (22.9%)
Cough	38 (54.3%)
Barking	11 (15.7%)

Shortness of Breath	8 (11.4%)
Wheezing	1 (1.4%)
Rales	1 (1.4%)
Stridor	6 (8.6%)
Sore. Throat	1 (1.4%)
Nausea	9 (12.9%)
Vomiting	30 (42.9%)
Abdominal Pain	4 (5.7%)
Diarrhea	12 (17.1%)
Constipation	1 (1.4%)
Decreased. Appetite	12 (17.1%)
cardiac involvement	1 (1.4%)
Fatigue	11 (15.7%)

Table 1. Demographic and clinical manifestation of patients with Covid-19

Variables		Total (n=70)
WBC ($\times 10^9$ / L)	Lymphopenia	6 (8.6%)
	Normal	56(80.0%)
	Leukocytosis	7(10.0%)
	Missing system	1 (1.4%)
Hb(g/dl)	Anemia	48 (68.6%)
	Normal	21(30.0%)
	Missing system	1 (1.4%)
PLT($\times 10^9$ / L)	Thrombocytopenia	10 (14.3%)
	Normal	54 (77.1%)
	Thrombocytosis	5(7.1%)

	Missing system	1 (1.4%)
CRP (mg/L)	High	18(25.7%)
	Normal	47(67.1%)
	Missing system	5(7.1%)
Ca	Hypocalcemia	8(11.4%)
	Normal	44(62.9%)
	Hypercalcemia	5(7.1%)
	Missing system	13(18.6%)
Na	Hyponatremia	57(81.4%)
	Missing system	13(18.6%)
K	Hypopotassemia	3 (4.3%)
	Normal	57 (81.4%)
	Hyperpotassemia	5 (7.1%)
	Missing system	5 (7.1%)
Lung.CT		4 (5.7%)
CXY		8 (11.4%)

Table2. laboratory and radiological finding of patients with covid-19 positive

Acknowledgment

The authors greatly thank all the individuals who consented to participate in this study.

Financial Support

This study was supported by Babol University of medical science.

Conflict of Interest

None.

Authors' Contribution

Obtaining the data and statistical analyses, Hanie Esfandiar, Rahmatollah Najafi, laboratory working, Farzin Sadeghi, Abazar pournajaf, writing and revising manuscript, Mohsen Mohammadi, Parisa Ebrahimzadeh mojaveri, Ali mohammad pour mir.

References

- 1.Samidoust P, Nikoupour H, Hemmati H, Samidoust A. Clinical Manifestations and Characterization of COVID-19 in Liver Transplant Recipients: A Systematic Review of Case Reports and Case Series. *Ethiopian Journal of Health Sciences*. 2021;31(2).
- 2.Cai J, Wang X, Ge Y, Xia A, Chang H, Tian H, et al. First case of 2019 novel coronavirus infection in children in Shanghai. *Zhonghua er ke za zhi= Chinese journal of pediatrics*. 2020;58(2):86-7.
- 3.Mohiuddin M, Kasahara K. Investigating the aggressiveness of the COVID-19 Omicron variant and suggestions for possible treatment options. Elsevier; 2021. p. 106716.
- 4.Khan A, Chakravarty A, Jain A, Harish R, Naqishbandi R, Ishani T. Clinical spectrum of neurological manifestations in pediatric Covid-19 illness: a case series. *Journal of Tropical Pediatrics*. 2021;67(3): fmab059.
- 5.Xu J, Zhao S, Teng T, Abdalla AE, Zhu W, Xie L, et al. Systematic comparison of two animal-to-human transmitted human coronaviruses: SARS-CoV-2 and SARS-CoV. *Viruses*. 2020;12(2):244.
- 6.Zhu L, Wang J, Huang R, Liu L, Zhao H, Wu C, et al. Clinical characteristics of a case series of children with coronavirus disease 2019. *Pediatric pulmonology*. 2020;55(6):1430-2.
- 7.Thomas E, Delabat S, Carattini YL, Andrews DM. SARS-CoV-2 and variant diagnostic testing approaches in the United States. *Viruses*. 2021;13(12):2492.
- 8.Dächert C, Muenchhoff M, Graf A, Autenrieth H, Bender S, Mairhofer H, et al. Rapid and sensitive identification of omicron by variant-specific PCR and nanopore sequencing: paradigm for diagnostics of emerging SARS-CoV-2 variants. *Medical Microbiology and Immunology*. 2022:1-7.
- 9.Yasuhara J, Kuno T, Takagi H, Sumitomo N. Clinical characteristics of COVID-19 in children: a systematic review. *Pediatric pulmonology*. 2020;55(10):2565-75.
- 10.Cao Q, Chen Y-C, Chen C-L, Chiu C-H. SARS-CoV-2 infection in children: Transmission dynamics and clinical characteristics. *Journal of the Formosan Medical Association*. 2020;119(3):670.
- 11.Mogharab V, Pasha AMK, Javdani F, Hatami N. The first case of COVID-19 infection in a 75-day-old infant in Jahrom City, south of Iran. *Journal of the Formosan Medical Association*. 2020;119(5):995.
- 12.Covid C, Team R, Covid C, Team R, Bialek S, Gierke R, et al. Coronavirus disease 2019 in children—United States, february 12–april 2, 2020. *Morbidity and Mortality Weekly Report*. 2020;69(14):422.
- 13.Group A-S. Remdesivir for the treatment of Covid-19: final report. *N Engl J Med*. 2020;383(19):1813-26.