Pediatric presentation of COVID-19. – Case Series

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ABSTRACT : This paper is about 7 patients who were either tested positive or heavily suspected of COVID-19 infection. Patients complained mostly of fever, fatigue malaise and sharp pain in lungs. Analysis showed that the pulmonary infiltrates were present in 3/7 patients, of which one was ground glass pattern. Isolation measures have been taken to prevent further spreading of the disease. We found that treatment with cephtriaxone proved very effective in treating superinfections. Oxygen support was required in 4/7 cases. Lymphopenia was absent in all cases. We support, that children suffer from mild forms of COVID-19 as no patient was in critical condition. However, we recommend that all children with COVID 19 infection be placed in isolation under supervision for the possibility of developing severe COVID-19 infection.

KEYWORDS. COVID-19, SARS-CoV-2, adolescent, severe, oxygen support

I.   INTRODUCTION

In December 2019 in Wuhan city, world was startled by a novel coronavirus named severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) which usually causes mild flu-like symptoms such as fever, fatigue, cough, dyspnea, sore throat, myalgia or arthralgia and headache. (1,2) Severe forms of coronavirus disease 2019 (COVID-19) include acute respiratory disease syndrome (ARDS), sepsis, shock, multiorgan failure or even death (2,3) and usually are presented in adults in advanced age and with following comorbidities, hypertension, type 2 diabetes mellitus, cardiovascular disease, chronic respiratory disease, chronic kidney disease, immune compromised status, cancer, smoking and obesity.(4)This case presents a severe case of adolescent COVID-19 with obesity and bronchitis as risk factors.

II.   CASE SERIES

In this study we analyzed the reports of 7 patients suffering from COVID-19 infection. Of these, 5 patients had confirmed COVID-19 infection while other 2 had a parent with COVID-19 and presented with a pneumonia. Average age of the patients was 9.4 years. Patients were admitted due to fever, malaise, dyspnea and lung pain. Routine blood examination showed on average: C-reactive protein 30.3 (2-111), erythrocytes 4.77×10^{12}/L (4-5.46), hemoglobin 129 g/L (77.5-152), hematocrit 0.40 (0.34-0.47),MCV 84.47(77.5-97),MCH27.7(26-28), MCHC333.74(318-361) RDW 13.91 (12-15.5), leukocyte 6.1×10^9/L (4-13), neutrophile ratio 43.4%, lymphocyte ratio 30.91%, monocyte ratio 6.77%, thrombocyte 230×10^9/L. Average oxygen saturation (SpO_2) at the time of admission was 89%. Chest x-ray (CXR) showed bilaterally pulmonary infiltrationin 43% (3/7) patients. Ground glass opacity, typical of COVID was observed in only one patient (Figure1).
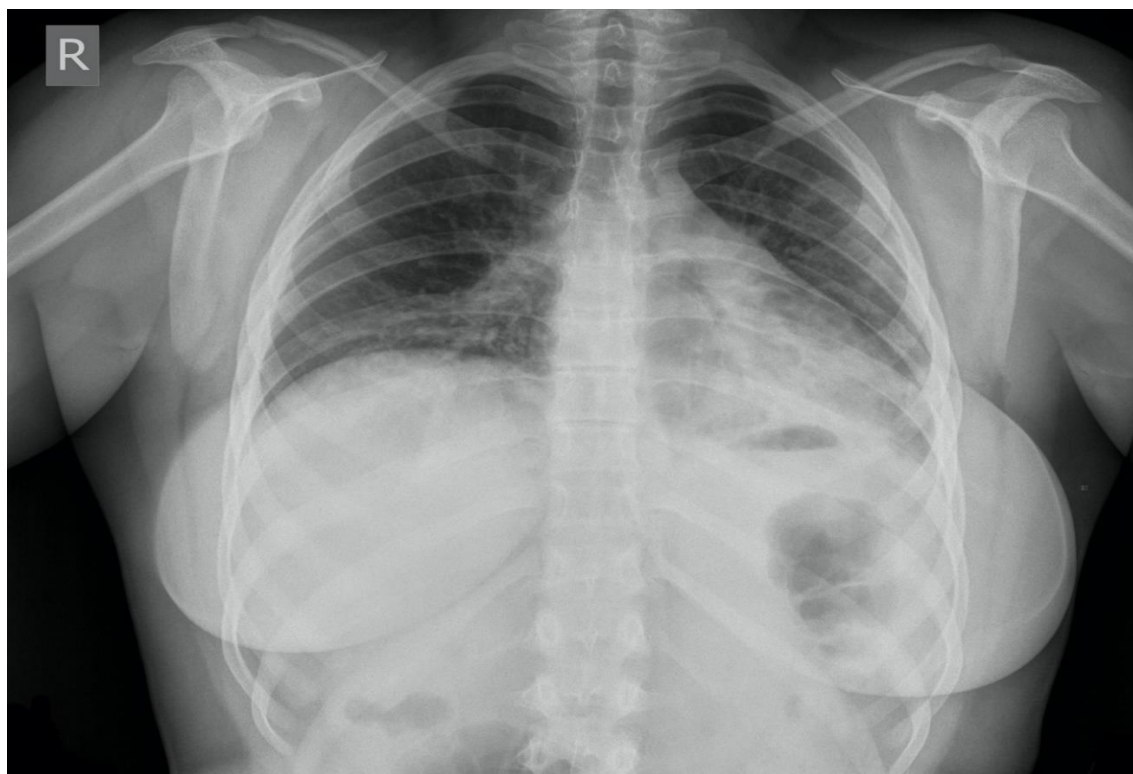
Figure 1. Chest X ray (CXR) on thedayofadmissonin general hospitalshowedbilaterally pulmonary infiltration more to the left and basally

CT scan of the same patients is shown as well (Figure 2).Chest CT imageaftertheadmissionshowedmultiplepatchy consolidations bilaterally, more to the left, bilaterally more to the posterior section, and basally, per type ground glass opacification.
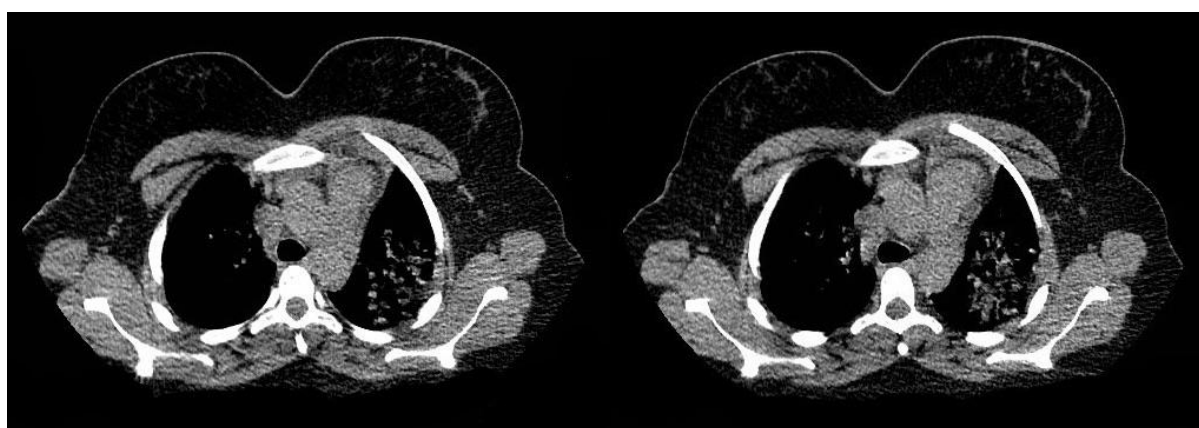

Figure 2. Chest CT image

Patients were put in isolation and were treated mostly by ceftriaxone 85% (6/7), and one patient did not receive medication at all. Other prescribed medications were montelukast, midecamycin, heparin, vancomycin, azithromycin and vitamin C supplementation. Oxygen support was administered to 57% (4/7) patients. One patient required high flow of oxygen 20 L/min 43% 3/7 patients did not require oxygen at all.Inferential statistics showed, that most parameters correlate according to age and inflammation, however, there were no significant correlations between the lymphocyte number, CRP and temperature. Temperature correlated with leukocytes and thrombocytes but not with the monocyteslymphocytes (Table 1).Please note no statistical significance between lymphocyte percentage, monocyte and thrombocyte percentages and CRP.

Table 1. Correlations between examined parameters.

		CRP	Leukocytes	Neutrophiles	Lymphocytes	Monocytes	Thrombocytes
Spearman Correlations							
Age	Correlation Coefficient	.036	-.109	.667	-.377	.551	-.072
	Sig. (2-tailed)	.938	.816	.148	.461	.257	.878
	N	7	7	6	6	6	7
Temperature	Correlation Coefficient	.445	-.845*	-.464	.493	.464	-.937**
	Sig. (2-tailed)	.317	.017	.354	.321	.354	.002
	N	7	7	6	6	6	7
CRP	Correlation Coefficient	1.000	-.027	.257	.086	-.029	-.306
	Sig. (2-tailed)	.	.954	.623	.872	.957	.504
	N	7	7	6	6	6	7
Leukocytes	Correlation Coefficient	-.027	1.000	.812*	-.522	-.145	.955**
	Sig. (2-tailed)	.954	.	.050	.288	.784	.001
	N	7	7	6	6	6	7
Neutrophiles	Correlation Coefficient	.257	.812*	1.000	-.543	-.029	.714
	Sig. (2-tailed)	.623	.050	.	.266	.957	.111
	N	6	6	6	6	6	6
Lymphocytes	Correlation Coefficient	.086	-.522	-.543	1.000	-.257	-.600
	Sig. (2-tailed)	.872	.288	.266	.	.623	.208
	N	6	6	6	6	6	6
Monocytes	Correlation Coefficient	-.029	-.145	-.029	-.257	1.000	-.143
	Sig. (2-tailed)	.957	.784	.957	.623	.	.787
	N	6	6	6	6	6	6
Thrombocytes	Correlation Coefficient	-.306	.955**	.714	-.600	-.143	1.000
	Sig. (2-tailed)	.504	.001	.111	.208	.787	.
	N	7	7	6	6	6	7
. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).							

III. DISCUSSION

Clinical manifestations of COVID-19 are divided in mild, moderate, severe and critical form. (5) Most Patients with COVID-19 develop mild flu-like symptoms such as fever, fatigue, cough, dyspnea, sore throat, myalgia or arthralgia and headache. (1,2) and rarely progress to severe forms which include acute respiratory disease syndrome (ARDS), sepsis, shock, multiorgan failure or even death. (3,4) Patients with comorbidities such ashypertension, type 2 diabetes mellitus, cardiovascular disease, chronic respiratory disease, chronic kidney disease, immune compromised status, cancer, smoking and obesity are at a greater risk for severe forms of the disease. Data regarding children and adolescents COVID-19indicate that they mostly develop mild clinical and radiological symptoms (6) and rarely progress to severe of critical forms, which is in accordance to our results. Interesting to note is observation, that while temperature did correlate with the number of leukocytes, monocytes and thrombocytes as can be expected, we noted no correlation between any parameters and lymphocyte fraction. It has been established, that lymphopenia is an important prognostic factor, predictive of bad outcome (7,8) and all of our patients had normal fraction of lymphocytes.There are a few risk factors in this population that could indicate the severity of the disease such as congenital heart disease, bronchial pulmonary hypoplasia, respiratory tract anomaly, abnormal hemoglobin level or immunocompromised status. (9) Obesity as a great COVID-19 severity risk factor in adults, could also be applied in obese children and adolescents. There is lack of data regarding this risk factor and further studies should be conducted to assess the association between the entities.

IV. CONCLUSION

Even though, children and adolescents, usually develop mild clinical symptoms and show no pneumonia on imaging modalities, special focus should be placedonchildren and adolescents with other chronic illnesses particularly pertaining torespiratory system. If these children and adolescents test positive for COVID-19, they should be under careful surveillance and immediate quarantine. This study lacks the sample size, and so, it is necessary to research the inflammatory response of more children, with focus on their lymphocytes count. In addition, we recommend further research including more parameters of inflammation such as IL-6 and TNF-alpha.

Conflictofinterest: The authorshavedeclared no conflictofinterest.

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