CLINICAL PATTERNS OF COVID-19 AMONG CRITICALLY ILL CHILDREN ADMITTED TO THE PEDIATRIC INTENSIVE CARE UNIT OF ALEXANDRIA UNIVERSITY CHILDREN'S HOSPITAL

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Introduction

SARS-CoV-2, a beta coronavirus, primarily spreads through respiratory droplets and can cause mild to severe illness in children. It was first identified in Wuhan, China, in December 2019, leading to the global pandemic known as COVID-19.

In children, COVID-19 symptoms are usually mild, such as fever, cough, and gastrointestinal problems. Severe complications likeacute respiratory distress syndrome and multisystem inflammatory syndrome are rare but can happen, especially in children with existing health conditions. Anosmia and ageusia are uncommon symptoms in children.

Male gender, high inflammatory markers, and low lymphocyte counts are linked to poor outcomes such as death, PICU admission, critical illness, need for respiratory support, and prolonged hospital stay.

Children may have lower ACE2 expression, which could lessen the severity of infection. However, some children may still experience long-term effects such as mental health issues and long COVID syndrome. Early detection and intervention are essential, especially for high-risk children.

Aim of the Work

The aim of this study was to describe the clinical characteristics, laboratory parameters, treatment, and outcome of cases with COVID-19 admitted to the pediatric intensive care unit at Alexandria University Children's Hospital during the COVID-19 pandemic by putting forward specific predictors of unfavorable outcomes.

Patients and Methods

This retrospective study analyzed data from the NEPICU(Nawawy's Egyptian Program for Pediatric Intensive Care Unit) of 116 children, aged 1 month to 17 years, with confirmed SARS-CoV-2 infection admitted to the Pediatric Intensive Care Unit at Alexandria University Children's Hospital during the COVID-19 pandemic.

Data was collected on clinical characteristics, laboratory and radiological findings, complications, treatment, and outcomes. Cases were confirmed using RT-PCR or positive IgG/IgM antibodies. Predictors of poor outcomes were analyzed through univariate and multivariate analyses.

Results

Table 1: Univariate and multivariate Logistic regression analysis for the parameters affecting Mortality (n = 44 vs. 72)

	Univariate		#Multivariate	
	p	**OR (LL – UL 95%C.I)**	**p**	**OR (LL – UL 95%C.I)**
PIM 3 score	0.011*	1.023 (1.005 – 1.040)	0.947	1.001 (0.977 – 1.025)
PELOD score	<0.001*	1.159 (1.084 – 1.240)	<0.001*	1.191 (1.089 – 1.302)
Number of complications [≥ 5]	<0.001*	10.333 (2.926 – 36.490)	0.282	2.753 (0.436 – 17.385)
ARDS	0.031*	2.700 (1.095 – 6.658)	0.263	2.408 (0.516 – 11.226)
Heart Failure	0.019*	2.660 (1.177 – 6.011)	0.472	1.611 (0.439 – 5.910)
Leucopenia	0.022*	6.622 (1.309 – 33.499)	0.131	6.925 (0.561 – 85.404)
Thrombocytopenia	<0.001*	6.667 (2.592 – 17.146)	0.072	3.779 (0.886 – 16.110)
Coagulopathy	0.006*	2.990 (1.372 – 6.519)	0.181	2.239 (0.687 – 7.304)
Bacterial Co-Infection	0.004*	3.333 (1.483 – 7.494)	0.009*	4.998 (1.494 – 16.718)
MODS	<0.001*	5.204 (2.309 – 11.731)	0.490	1.708 (0.373 – 7.824)

During a 41-month study period from January 2020 to May 2023, we analyzed 116 COVID-19-positive patients. Of these patients, 62.07% were discharged, while 37.93% died. Among the cohort, 61.2% had comorbidities, with the most common being cardiac (30.98%), neurological (28.16%), and gastrointestinal (25.35%) conditions.

Symptoms most frequently observed included fever (52.59%), respiratory distress (45.69%), vomiting (30.2%), and cough (28.45%).

The most common complications were systemic (85.3%), respiratory (73.25%), and hematologic (70.6%).

Higher mortality was associated with higher PM3 and PELOD scores, five or more complications during PICU stay, ARDS, heart failure, leukopenia, thrombocytopenia, coagulopathy, bacterial co-infection, and Multi-Organ Dysfunction Syndrome.

Notably, the higher PELOD score and bacterial co-infection were independently significant factors for mortality, remaining relevant in both univariate and multivariate analyses.

Conclusion

COVID-19 pediatric patients, although mostly asymptomatic, may develop severe and fatal disease requiring admission to the PICU. To effectively manage these severe pediatric COVID-19 cases, it is crucial to focus on their underlying medical conditions, severity score upon admission, and any complications that may arise during the infection. Additionally, prompt diagnosis and adequate treatment of any co-infections are essential, with close monitoring for good follow-up care.