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Morbidity And Mortality Profile Of Pediatric Patients Admitted With SARI(During Covid-19 virus Pandemic) At A Tertiary Care Hospital, North India (Punjab)

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Abstract

Background: SARI(severe acute respiratory illness) defined as an acute respiratory illness with history of fever or body temperature >38°C, cough, difficulty in breathing with onset within last 10 days and requires hospitalization Severe acute respiratory illness (SARI) is one of the major causes of morbidity and mortality in young children especially in developing countries. Despite advances in child health care, the impact of acute respiratory illness remained marked. Burden of disease is more in patients with underlying co-morbidities., Because of lockdown during this Covid-19 pandemic, all the people were forced to stay home. This leads to overcrowding at homes, which made the children with co-morbid conditions more vulnerable to infections. As Covid -19 virus infected adult patients were admitted with presenting features of SARI, but Covid-19 virus infection presentation in children was not much clear. Thus, the present study is conducted at a tertiary care hospital in North India, to know the various causes of SARI in pediatric population during Covid-19 pandemic.

Methods: The data of pediatrics patients admitted with SARI from March 2020 to February 2021 was analyzed retrospectively. A semi-structured questionnaire was used to collect information on demographics (e.g. age, sex), pre-existing morbid conditions (e.g. diagnosed lung or heart disease, any other illness), history of present respiratory illness (e.g. sudden onset fever, cough, sore throat, shortness of breath during the preceding week to 10 days. Data was analyzed on SPSS software, p value of less than 0.05 is considered significant.

Results: A total of 104 pediatric patients were admitted with SARI from March 2020 to February 2021. Majority of the patients 42 (41.3%) were above 11years of age. Fever, cough and fast breathing/respiratory distress (RD) were the chief presenting complaints. Majority of patients with RD along with fever and cough stayed for more than 5 days in hospital (p=0.00). Symptoms like fever, cough, oxygen inhalation, admission to intensive care unit, age less than 5 years and hospital stay of more than 5 days were significantly associated with RD (p=0.00). 6 (5.8%) were RTPCR positive for Covid-19 virus .Majority of them were more than 11 years age group(Adolescents) (P=0.00). Mortality was more in these children and with underlying co-morbidities.

Conclusion: SARI was the chief presenting features of Covid -19 virus infections in children who were above 11 years of age group(Adolescents). Mortality was more in these children. Patients with co-morbidities were more vulnerable to develop severe illness, so early intervention in these patients can be lifesaving. While dealing with SARI patients our focus should not be only on respiratory system and Covid-19 virus disease but other systemic involvement should also be viewed properly.

Keywords: Morbidity, SARI (Severe acute respiratory illness Respiratory distress) , Mortality, DKA (diabetic ketoacidosis),Covid positive(RTPCR test positive for covid-19 virus) ,ICU(Intensive Care Unit),CHD(Congenital Heart Disease).

INTRODUCTION

SARI(severe acute respiratory illness) defined as an acute respiratory illness with history of fever or body temperature >38°C, cough, difficulty in breathing with onset within last 10 days and requires hospitalization (9). Severe Acute respiratory illnesses are one of the major causes of morbidity and mortality in young children especially in developing countries. . The SARI definition aims to capture both the influenza-related pneumonias and influenza-related exacerbations of chronic illnesses such as asthma or heart disease. In countries where the burden of influenza has been carefully studied, a proportion of influenza-related hospitalizations and deaths receive other diagnoses than pneumonia (10,11). The World Health Organization (WHO) estimates that acute respiratory infections (ARI) cause annual deaths around 4 million, at a rate of more than 60 deaths/100,000 populations [10]. Viruses are responsible for 30-70% of ARI where respiratory syncytial virus (RSV), influenza virus, parainfluenza virus (PIV), human Bocavirus, human metapneumovirus (hMPV), adenovirus, rhinovirus, enterovirus and Coronaviruses account for the majority of these cases [1, 2]. Seasonality is one of the features of respiratory viruses and geographical variations related to temperature, rainfall, and relative humidity have been identified in epidemiological studies. Infrequent hand washing and poor respiratory hygiene (e.g. not covering mouth when sneezing and coughing), (12) limited access to health care, lack of awareness of antiviral treatment and its availability, a huge shortage of influenza vaccines early in the pandemic, and a high prevalence of malnutrition(13) may have worsened the pandemic in low-income countries such as Bangladesh(14). In general, the rate of hospitalization associated with seasonal and pandemic influenza in low-income tropical and subtropical countries remains largely unknown. Influenza cases presenting with SARI has a high burden of disease and mortality worldwide, especially among groups at increased risk for complications, such as children under 5 years, elderly people, pregnant women, and individuals with chronic medical conditions (1,6). A substantial proportion of SARIs are caused by influenza viruses [12], which circulate across India in varied seasonal patterns governed by latitude and environmental factors (9). In 2004, the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR) initiated influenza surveillance among children aged less than 5 years in urban areas of Dhaka. During 2004–2007, the incidence of laboratory confirmed influenza infection among children aged less than 5 years was estimated at 10.2 per 100 people per year, seeking care at ambulatory clinics (15). In April 2007, the Government of Bangladesh and ICDDR initiated national hospital-based influenza surveillance with a network of 12 surveillance hospitals throughout the country to provide nationally-representative data from all age groups. Although this national surveillance system helped to establish the seasonality of influenza, which typically occurs during the monsoon season from May to September (16), the incidence of influenza could not be estimated because people in hospital catchment areas sought care not just in hospitals but in other facilities as well and data on the population at risk, needed for the denominator, were not available.

The 2009 influenza pandemic had highlighted the need for more global data on severe influenza disease, so the WHO recommended conducting surveillance for hospitalized severe acute respiratory infection (SARI), as well as influenza-like illness (ILI) in outpatients [3]. SARI surveillances are now conducted in many countries around the world. A plan was designed to help countries prepare for influenza virus pandemics like the ones experienced in 2009, when timely detection of the emergent virus failed, impeding the effectiveness of mitigation measures (8). One result of this experience was the development of an active surveillance network to monitor admitted patients with severe acute respiratory infections (SARI) in sentinel hospitals

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that includes appropriate sampling, laboratory testing, and early online reporting. The SARI surveillance network (SARInet) has been operating in various countries in Latin America and the Caribbean since 2011. In Chile, it includes six hospitals in different geographic regions (north, central, and south). Ongoing efforts to strengthen surveillance are focused on, 1- detection of new emerging respiratory viruses; 2- analysis of the circulation of different influenza types and subtypes; 3- facilitation of vaccine composition; and 4- evaluation of vaccine and antiviral therapy's effectiveness to help prevent death or complications (11). Knowledge gained from pandemics in the past led to the development of the World Health Organization (WHO) Global Pandemics Preparedness Plan at the beginning of the 21st century (7). During Covid-19 SRS virus pandemic, most of the Covid-19 virus positive adult patients were admitted with SARI, but presenting features of covid nfection in pediatrics population were not much known. Because of non-availability of much data about Covid-19 virus presentation in pediatrics population, the present study was designed to identify morbidity and mortality factors among pediatrics patients admitted with SARI(Covid-19 RTPCR negative), during Covid-19 Pandemic, at a tertiary care hospital in North India

METHODOLOGY-

Study setting

A retrospective study was conducted, amongst pediatrics patients admitted with SARI(Covid-19 RTPCR negative) at GMC,Rajindera Hospital ,Patiala, Punjab, from March 2020 to February 2021 (Covid-19 virus Pandemic period 1st wave). Since SARI is the most common presentation of COVID-19 virus infection in adult patients. Because of this, all the pediatric patients who were admitted either through emergency, Flu corner or referred from peripheral hospitals, with World Health Organization (WHO) definition of SARI and ILI were shifted to the pediatrics isolation ward as COVID-19 virus infection suspect/case. Immediate implementation of IPC measure was done at first contact of entry to hospital, either at Flu corner or pediatrics emergency or at isolation ward. All the patients admitted through Pediatrics emergency/ Flu corner or referred from outside with WHO's definition of SARI, were given surgical masks to cover mouth and nose and directed to isolation ward meant for Covid-19 suspects/positive patients. All the admitted patients were kept at 1m distance from each other. Standard precautions were applied in all areas of health care facility which includes hand hygiene and use of personal preventive equipment (PPE) when in direct or indirect contact with these patients.

Within 4-6 hrs of admission, Nasopharyngeal (NP) and Oropharyngeal (OP) samples were obtained from all the patients by trained personnel using standard IPC measures as prescribed by WHO (2019). Both NP & OP sample swabs were placed in 15ml falcon tube containing 2ml of viral transport medium (VTM) and were properly packed to keep temperature at 4°C by packing in icebox containing 4 ice packs and sent to VRDL of institute for Conventional or real-time reverse transcriptase-polymerase chain reaction (RT-PCR) study.

Depending upon RT-PCR test result, Covid-19 negative patients were shifted out of isolation ward either to general ICU or Pediatrics ward and investigated for other causes of SARI(Non-Covid). Depending upon clinical presentation patients were catogerised into different groups . **(See Box 1).**

Data collection

A semi-structured questionnaire was used to collect information on demographics (e.g. age, sex), history of present respiratory illness (e.g. sudden onset fever, cough, sore throat, shortness of breath during the preceding week to 10 days. Further data was also captured on progress during hospital stay, length of hospital stay and outcome of these patients. Presence of chronic pre-existing medical illness(es),Chronic respiratory diseases like Bronchial asthma, Tuberculosis, Diabetes.,Chronic cardiac disease,Chronic neurological or neuromuscular disease, Haematological disorders, Immunodeficiency, including Human Immunodeficiency Virus (HIV)were also recorded.

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Box 1: Classification of children with SARI

Mild illness	- cough, fever, sore throat, nasal congestion, nausea, vomiting
Pneumonia	-cough and fast breathing Respiratory Rate 2 months - 11 months >60/min 01 yr -05 yrs >40/min 06 yr-10 yrs >30/min 11 yr -15 yr >20/min
Severe Pneumonia	cough, fast breathing and chest retractions and with any one of the danger signs i.e. loss of consciousness, convulsions, vomiting everything
ARDS	Severe chest retractions/ signs of respiratory failure/ central cyanosis/ spO2 <92% at room air/ bilateral infiltrates on CT chest.
Sepsis	Suspected or proven infection >2 age based systemic inflammatory response syndrome criteria, of which one must be abnormal temperature >38.5°C (101.3°F) or <36°C (96.8°F) or Abnormal leukocyte count or >10% band cells. Tachycardia or bradycardia (if <1 year) or Tachypnea or mechanical ventilation (related to an acute process)
Severe Sepsis	Criteria (Sepsis + ≥ 1 following Dysfunction Criteria) Organ Dysfunction Criteria. Septic Shock Criteria (Sepsis + Cardiovascular Dysfunction).Cardiovascular dysfunction despite adequate fluid resuscitation OR ARDS OR ≥ 2 other organ dysfunction i.e. Acute Kidney Injury, Acute Liver Injury as Hepatic Encephalopathy, CNS insult as Encephalitis
Septic Shock	Any hypotension (SBP < 5th centile or > 2 SD below normal for age) or two or three of the following: altered mental state; tachycardia or bradycardia (HR < 90 bpm or > 160 bpm in infants and HR < 70 bpm or > 150 bpm in children); prolonged capillary refill (> 2 sec) or feeble pulse; tachypnoea; mottled or cool skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia (21).

Data Analysis

Data was analyzed by SPSS software. A value of $p<0.05$ was considered as significant. Logistic regression model was used to examine the association of respiratory distress with independent co-variables like age, length of hospital stay where as dropping oxygen inhalation and ICU care. In this logistic regression technique, the effect of each independent variable was assessed keeping the first and the last category as reference and all the independent variables were entered in the model. The odd ratio (OR) along with its 95% CI and corresponding p-value was reported.

Ethical standards -Prior to study initiation, the study protocol was reviewed and approved by Institutional ethical committee.

RESULTS;

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Study participant characteristics- A total of 104 patients were admitted with SARI from March 2020 to February 2021. Majority of children were between 12-15 years of age (40.4%) and 37.5% were less than 5 years of age, In study population 60(57.6%) were males and 44(42.3%) were females.

Fever and cough and fast breathing were present in all children. Respiratory distress was present 82.7% children.Oxygen therapy was given to 79(76%) patients. Some children improved but 69(66.3%) children were shifted to Intensive Care Unit due to one or the other serious conditions. Majority 31(73.8%) of ICU admissions were between 12-15 yrs of age and were male children. only 12(52.2%) was between 6-11 years. Out of total ICU admissions, 8(7.7%) patients were diagnosed with AKI, 7 patients amongst them had sepsis and septic shock also. 4 (3.8%) patients were admitted with deranged LFT's and features of Hepatic encephalopathy. 10(9.6) patients were diagnosed with encephalitis .6 (5.8%) children had RTPCR positive for covid-19 virus. Hospital stay of more than 5 days was there in 24(61.5%) children in less than 5 years age group and this was statistically significant (p=0.000).

Table 1: Demographic profile and clinical features

		Frequency	%
Age	0-5 years	39	37.5
	6-11 years	23	22.1
	12 years and above 12 years	42	40.4
Age in years (Mean±SD)			8.09±7.48
Length of stay in study hospital (in days)	0-5	51	49.0
	5 and above	53	51.0
Length of stay in days (Mean±SD)			5.09±4.33
Gender	Male	60	57.7
	Female	44	42.3
Fever	Yes	104	100.0
	No	0	0.0
Cough+Fast breathing	Yes	104	100.0
	No	0	0.0
Respiratory distress	No	18	17.3
	Yes	86	82.7
Oxygen inhalation	No	25	24.0
	Yes	79	76.0
ICU care	No	35	33.7

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	Yes	69	66.3
Congenital Heart disease(CHD)	No	100	96.2
	Yes	4	3.8
Congenital anomalies(CA)	No	102	98.1
	Yes	2	1.9
Septic shock	No	97	93.3
	Yes	7	6.7
Sepsis	No	97	93.3
	Yes	7	6.7
Acute kidney injury(AKI)	No	96	92.3
	Yes	8	7.7
Hepatic Encephalopathy	No	100	96.2
	Yes	4	3.8
Encephalitis	No	94	90.4
	Yes	10	9.6
HIV	No	103	99.0
	Yes	1	1.0
TB	No	99	95.2
	Yes	5	4.8
Bronchial Asthma	No	99	95.2
	Yes	5	4.8
Severe Anemia	No	96	92.3
	Yes	8	7.7
Pain Abdomen	No	103	99.0
	Yes	1	1.0
Sore Throat	No	100	96.2
	Yes	4	3.8
Ventilator Support	No	94	90.4
	Yes	10	9.6
Expired	No	98	94.2
	Yes	6	5.8
Covid -19RT-PCR Positive	No	98	94.2
	Yes	6	5.8

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Diabetic Keto Acidosis(DKA)	No	103	99.0
	Yes	1	1.0

All the patients had fever and cough and fast breathing. Respiratory distress (RD) was observed in 86(82.7%) of children and it was more 37(94.7%) in less than 5 years of age group . Oxygen therapy was given to all the patients admitted with RD, and oxygen requirement was more in less than 5 years of age group. This is statistically significant (p=0.00%). **(Table 2)**

Table 2: Age-wise distribution of symptoms

	0-5years		6-11 years		12 years and Above		Total	
	N	%	n	%	n	%	N	%
Fever	39	100.0	23	100.0	42	100.0	104	100.0
Cough	39	100.0	23	100.0	42	100.0	104	100.0
Respiratory distress	37	94.9	15	65.2	34	81.0	86	82.7
Oxygen inhalation	33	84.6	13	56.5	33	78.6	79	76.0
ICU care	26	66.7	12	52.2	31	73.8	69	66.3
CHD	4	10.3	0	0.0	0	0.0	4	3.8
CA	1	2.6	0	0.0	1	2.4	2	1.9
Septic shock	3	7.7	0	0.0	4	9.5	7	6.7
Sepsis	3	7.7	0	0.0	4	9.5	7	6.7
Acute kidney injury	4	10.3	0	0.0	4	9.5	8	7.7
Hepatic encephalopathy	2	5.1	1	4.3	1	2.4	4	3.8
Encephalitis	2	5.1	0	0.0	8	19.0	10	9.6
HIV	0	0.0	0	0.0	1	2.4	1	1.0
TB	0	0.0	0	0.0	5	11.9	5	4.8
Bronchial Asthma	0	0.0	1	4.3	4	9.5	5	4.8
Severe Anemia	8	20.5	0	0.0	0	0.0	8	7.7
Pain Abdomen	0	0.0	1	4.3	0	0.0	1	1.0
Sore Throat	3	7.7	1	4.3	0	0.0	4	3.8
Ventilator	2	5.1	0	0.0	8	19.0	10	9.6
Expired	2	5.1	0	0.0	4	9.5	6	5.8
Covid-19 RT-PCR positive	1	2.6	2	8.7	3	7.1	6	5.8
DKA	0	0.0	0	0.0	1	2.4	1	1.0

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Length Of hospital stay	0-5 days	15	38.5	14	60.9	21	50.0	50	48.1
	5 and above days	24	61.5	9	39.1	20	47.6	53	51.0

Table 3: Gender-wise distribution of symptoms

	Male		Female		Total	
	n	%	n	%	N	%
Fever	60	100.0	44	100.0	104	100.0
Cough	60	100.0	44	100.0	104	100.0
Respiratory distress	51	85.0	35	79.5	86	82.7
Oxygen inhalation	45	75.0	34	77.3	79	76.0
ICU care	37	61.7	32	72.7	69	66.3
Congenital Heart disease	2	3.3	2	4.5	4	3.8
Congenital anomalies	2	3.3	0	0.0	2	1.9
Septic shock	4	6.7	3	6.8	7	6.7
Sepsis	4	6.7	3	6.8	7	6.7
acute kidney injury	4	6.7	4	9.1	8	7.7
Hepatic encephalopathy	3	5.0	1	2.3	4	3.8
Encephalitis	4	6.7	6	13.6	10	9.6
HIV	1	1.7	0	0.0	1	1.0
TB	0	0.0	5	11.4	5	4.8
Bronchial Asthma	5	8.3	0	0.0	5	4.8
Severe Anemia	5	8.3	3	6.8	8	7.7
Pain Abdomen	0	0.0	1	2.3	1	1.0
Sore Throat	3	5.0	1	2.3	4	3.8
Ventilator	6	10.0	4	9.1	10	9.6
Expired	5	8.3	1	2.3	6	5.8
Covid -19 RT-PCR Positive	3	5.0	3	6.8	6	5.8
DKA	0	0.0	1	2.3	1	1.0
Length of stay 0-5 days	30	50.0	20	45.5	50	48.1
Length of stay 5 and above days	30	50.0	23	52.3	53	51.0

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Co-Morbid conditions- In study population,5(4.8%) female children more than 12 years of age were having Tuberculosis. Bronchial Asthma exacerbation was there in 5(4.8%) children and these were male patients more than 5 years of age. Severe anemia was in 8(7.7%%) children who were less than 5 years of age group, amongst them 5 were male and 3 were female. Out of these eight children, 3 patients were admitted with features of congestive heart failure. 4(3.8%) children with congenital heart disease (CHD) were below 5years of age, 2 females and 2 were male. 2(1.9%) patients were having other congenital anomalies 1 with Down's syndrome and other with anomalies of spine. One female 15 years of age was diagnosed with Diabetic ketoacidosis. (**Table 3)**

Clinical course and Outcome:- 69 children were shifted to ICU and out of this, 10(9.6%) patients required ventilator support due to severe respiratory difficulty and features of ARDS .Majority 63(60.5%) patients were shifted to pediatrics ward after initial stabilization and discharged in satisfactory conditions.

Average duration of hospital stay was from 5 days to 21 days. Majority 53(50.9%) patients stayed in hospital for more than 5 days, were less than 5 years of age group and it was statistically significant (p=0.000). Out of total ICU admissions, 6(5.7%) children expired within 24-72 hours of admission. Out these 6 patients, 4 patients were between 12-15 years of age . **(Table 4)**

Table 4.Outcome of patients in the study population

Outcome	N (%)
Improved without oxygen inhalation and shifted to ward	25(24%)
ICU admission	69(66.3%)
Ventilator support	10 (9.6%)
Discharged	95(91.3%)
Referred	3(2.8%)
Death	6(5.8%)

There was significant association between RD and other symptoms .Children with age less than 5 years of age, had hospital stay of more than 5 days and it was statistically significant. Oxygen inhalation was there in all the children who had RD and were admitted to ICU, this association was statistically significant. (**Table 5)**

Table 5: Association of respiratory distress with other symptoms

		N	Rate of respiratory distress	95% CI		Chi-squae value	p-value
				Lower	Upper		
Age of the child	0-5 years	37	94.9	87.9	101.8	9.04	0.00**
	6-11 years	15	65.2	45.8	84.7		
	12 years and above	34	81.0	69.1	92.8		

Gender of the child	Male	51	85.0	76.0	94.0	0.53	0.46
	Female	35	79.5	67.6	91.5		
Length of Hospital stay	0-5 days	34	68.0	55.1	80.9	14.2	0.00**
	5 and above days	51	96.2	91.1	101.4		
Fever	No	0	-	-	-	-	-
	Yes	86	82.7	75.4	90.0		
Cough	No	0	0	0	0	-	-
	Yes	86	82.7	75.4	90.0		
Oxygen inhalation	No	7	28.0	10.4	45.6	68.78	0.00 **
	Yes	79	100.0	100.0	100.0		
ICU care	No	17	48.6	32.0	65.1	42.9	0.00 **
	Yes	69	100.0	100.0	100.0		
CHD	No	82	82.0	74.5	89.5	0.87	0.35
	Yes	4	100.0	100.0	100.0		
CA	No	84	82.4	75.0	89.8	0.43	0.51
	Yes	2	100.0	100.0	100.0		
Septic shock	No	79	81.4	73.7	89.2	1.57	0.21
	Yes	7	100.0	100.0	100.0		
Sepsis	No	79	81.4	73.7	89.2	1.57	0.21
	Yes	7	100.0	100.0	100.0		
Acute kidney injury	No	78	81.3	73.4	89.1	1.81	0.18
	Yes	8	100.0	100.0	100.0		
Hepatic Encephalopathy	No	82	82.0	74.5	89.5	0.87	0.35
	Yes	4	100.0	100.0	100.0		
Encephalitis	No	76	80.9	72.9	88.8	2.32	0.13
	Yes	10	100.0	100.0	100.0		
HIV	No	85	82.5	75.2	89.9	0.21	0.65
	Yes	1	100.0	100.0	100.0		
TB	No	81	81.8	74.2	89.4	1.09	0.29
	Yes	5	100.0	100.0	100.0		
Bronchial	No	82	82.8	75.4	90.3	0.03	0.87

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Asthma	Yes	4	80.0	44.9	115.1		
Severe Anemia	No	78	81.3	73.4	89.1	1.81	0.18
	Yes	8	100.0	100.0	100.0		
Pain Abdomen	No	85	82.5	75.2	89.9	0.21	0.65
	Yes	1	100.0	100.0	100.0		
Sore Throat	No	83	83.0	75.6	90.4	0.17	0.68
	Yes	3	75.0	32.6	117.4		
Ventilator support	No	76	80.9	72.9	88.8	2.32	0.13
	Yes	10	100.0	100.0	100.0		
Expired	No	80	81.6	74.0	89.3	1.33	0.25
	Yes	6	100	100.0	100.0		
Covid-19 positive	No	80	81.6	74.0	89.3	1.33	0.25
	Yes	6	100.0	100.0	100.0		
DKA	No	85	82.5	75.2	89.9	0.21	0.65
	Yes	1	100.0	100.0	100.0		

**p<0.01 level and *p<0.05

Multiple regression models was applied and it showed that hospital stay of 5 days and more than 5 days was the only significant product of RD among SARI children.The Odd ratio was also higher in children who stayed in hospital for 5 days or more than 5 days. Based on preliminary assessment oxygen inhalation and ICU care were excluded from final regression model.(**Table 6)**

Table 6: Effect of determinants on respiratory distress using multiple logistic regressions

		Odd ratio (OR)	p-value	95% C.I	
				Lower	Upper
Age	0-5 year	3.95	0.11	0.74	21.21
	6-11years	0.48	0.26	0.14	1.71
	12 and above (Reference category)	-	-	-	-
Length of stay	0-5 days(Reference days)	-	-	-	-
	5 and above days	10.73	0.00**	2.25	51.1
Constant		1.96	0.13		

**p<0.01 level

Dependent variable : Respiratory distress

Independent variables: Age and Length of stay, whereas dropping oxygen inhalation and ICU care

Discussion: This Covid-19 virus pandemic affected every walk of life. To contain the virus spread, lockdown was enforced, which lead to overcrowding in houses. People lost their jobs which means loss of healthy food and compromised in health. Due to lockdowns, chronic disease patients lost their follow ups. All these factors further added to increase in disease burden. The burden of disease is more in children less than 5 years of age group, and highest in less than 1year of age children. With the severity of disease, days of hospital stay also increases. With the prolonged hospital stay, mortality rate increased. In our study, children in less than 5 years age group had hospital stay of more than 5 days. Respiratory distress (RD) was also observed more in this age group. Oxygen therapy was given to all the patients admitted with RD, and oxygen requirement was more in less than 5 years of age group. Hatem et al reported that children less than 5years of age represented 83% of patients of SARI. Majority of patients were less than 1 years in a Study from Egypt by Amani et al (6).But in our study population, majority of children were above 11 years of age group.

Majority of children in our study were males. This was in contrast to a study by Ashraf Hatem from Egypt where 53% patients of study population were females and 47% were males (3). Similar results were obtained from Chile where 56.1% of study population was comprised by females and only 53.9% were males (2).

Some patients present with only ILI symptoms only. In present study, 20 patients (19.2%) were diagnosed as having mild illness and 15 patients (14.4%) were diagnosed with pneumonia. But Alberto Fica et al in their study, SARI from Influenza virus in Adult patients in Chile, in 2015, reported that Pneumonia was the most frequent clinical manifestation, occurring in 57.0%. In contrast to our study, Zhibin Peng in a study, Clinical characteristics of hospitalized severe acute respiratory illnesses (SARI) in children and risk factors analysis of severe illness from China, observed that 97.7% was having mild illnesses, and 2.3% were with severe illnesses.

Children who were admitted with Respiratory distress and signs of ARDS needs Intensive Unit Care and ventilator support . In our study,69 children were shifted to ICU and only 10 (9.6%) patients required ventilator support due to severe respiratory difficulty and features of ARDS . Alberto Fata et al observed that 26.7% patients occupied Critical care beds and 19.5% patients needed ventilator assistance.

Because of this association of respiratory distress with other symptoms was done by using upper and lower values of CI**,** Chi-square value and p-value, $p<0.05$ was considered as significant. Logistic regression was used to examine the association of respiratory distress with independent co variables like age, duration of hospital stay where as dropping oxygen inhalation and ICU care. In this logistic regression technique, the effect of each independent variable was assessed keeping the first and the last category as reference and all the independent variables were entered in the model. The odd ratio (OR) along with its 95% CI and corresponding p-value was reported. Similar data analysis was used by Ashraf Hatem,and similar results were observed in a study surveillance from Egypt (3)

Severe form of disease was observed in children with underlying co-morbid conditions .In present study only 16(15.3%) of patients had co-morbidities like, severe anemia with signs of CHF , acute severe bronchial asthma , pulmonary tuberculosis , diabetic ketoacidosis and HIV positive,Congenital anomalies(Down's syndrome) and CHD(VSD). In a study from Egypt these co-morbidities included chronic respiratory disorders (asthma, COPD, bronchiectasis, and immotile cilia syndrome), cardiac disorders (heart failure congenital heart diseases, and cardiomyopathy), neuromuscular disorders (epilepsy, cerebral palsy, and myopathies), hematological disorders (thalassemia), endocrine disorders (diabetes mellitus, hypothyroidism, and morbid obesity), renal disorders (end-stage renal disease), and liver disorders (liver cirrhosis and hepatic failure)were reported . But in contrast to this, in a study from china, the proportions of severe illness and mild illness with at least one chronic medical condition were 32.3% (21/65) and 8.4% (240/2 872) (χ^2 = 45.03, $P < 0.001$). (8)

Mortality was more in children with co-morbid conditions.In present study mortality was 5.8%. All these children were admitted in ICU and required ventilator support. All were having one or the other underlying co-morbid conditions . Out of this, two patients were RTPCR positive for Covid-19 virus.

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But study from Egypt showed overall mortality in SARI patients was (2.2%) 24 out of 1,075. Overall, only 2 (8%) were adults, while 22 (92%) were children. Amongst children, 18(75%) were aged <5 years. Overall, two-thirds (16/24) had co-morbidities. All patients who died were admitted to the ICU and were mechanically ventilated (3). Similar results were obtained by Amanie, et al ,where 21 patients (5.5%) died, 16 of whom were admitted to the PICU and were on ventilator. Fifteen of the patients who died had an underlying chronic illness (71.4%). All the patients who died were under one year of age (6). In contrast to this in our study majority of the patients who died were between 12-15years of age.

Conclusion: SARI is not the chief presenting features of Covid -19 virus infections in peadiatrics age group**.**

There are other co-morbid conditions which present with SARI like features, so while dealing with SARI patients our focus should be not only on respiratory system but other systems involvement should also be viewed properly. Patients with co-morbidities are more vulnerable to severe disease , so early diagnosis and timely treatment can be life saving for these children.

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