

Original Research Article

A STUDY TO DETERMINE THE CLINICAL PROFILE AND OUTCOME OF COVID POSITIVE CHILDREN ADMITTED TO A TERTIARY CARE CENTER IN GARHWAL REGION OF UTTARAKHAND, INDIA.

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Abstract

Objectives: The present study examined the clinical profile of COVID-19, related morbidity and mortality in children at a tertiary care hospital in Uttarakhand. Understanding the clinical profile of the disease in this specific population is vital for better preparedness and targeted interventions to safeguard the health of children during future outbreaks. This is the first study from this region in this

Methods: The present study was a hospital based observational study carried out on patients aged 1 month-18 years who tested covid-19 positive and were admitted to Department of Pediatrics at a tertiary care center in Garhwal region of Uttarakhand during study period July 2020 to May 2023 after getting ethical clearance from Institutional Review Committee and informed consent from patient or patient relatives. Statistical testing has been conducted using R Studio Software version 4.

Results: A total of 51 patients with Covid-19 infection, tested positive by either rapid antigen test (RAT) or reverse transcriptase polymerase chain reaction (RTPCR) were admitted to our hospital during the study period. History of covid contact was positive in 11% patients. Comorbidities were seen in 10% patients. Respiratory system (41%) was most commonly involved followed by central nervous system (febrile seizures). Fever (70%) followed by cough (33%) were the most common symptoms. Raised ESR levels was the most common laboratory finding.

Conclusions: The infection in children is usually mild, with low mortality rate (2%). Respiratory system was most commonly involved and fever and cough were the most common symptoms.

Keywords: Covid-19, SARS COV 2, Children, Morbidity, Mortality

INTRODUCTION

A surge of pneumonia of unknown aetiology in Wuhan City, Hubei province in China emerged in December 2019. A novel coronavirus was identified as the causative agent and was later termed COVID-19 by the World Health Organization (WHO) ^[1].

In 2019 World Health Organisation (WHO) declared novel corona virus (2019-nCoV) sixth public health emergency of international concern ^[2]. COVID-19, emerged as a global health crisis in early 2020, affecting people of all age group. While the virus predominantly affected adults, children also became a key focus of research and public health efforts due to their unique vulnerability and potential role of transmission. Understanding the impact of COVID-19 in children is essential to develop effective strategies for prevention, management and ensuring their wellbeing.

Materials and Methods

This was a hospital based Observational study, carried out on all patients aged 1 month-18 years who tested covid-19 positive and fulfilled the inclusion criteria, admitted in the Department of Paediatrics at a tertiary care center in Garhwal region of Uttarakhand from July 2020 to May 2023.

Patients were evaluated based on their demographic parameters and presenting clinical features. Detailed clinical evaluation was performed and routine investigations were sent. The investigations were reviewed for relevant findings and clinical course was monitored. Patients were treated based on established treatment protocols according to the primary presenting condition and the associated comorbidities. Appropriate duration of treatment was provided and the final outcome was recorded.

Patient's attendants were counselled about the objectives of the study, and written consent obtained. Structured interviews were conducted at first contact with the patient's attendants. During hospital stay and at discharge, they were explained in detail about the nature of the patient's condition and counselled regarding further follow up.

Data collection tool was a pre-coded which was also translated in the local dialect. All the patient's details were followed till they were discharged/expired.

Selection Criteria

Inclusion Criteria

- All children aged 1 month-18 years who tested Covid-19 positive by RAT or RTPCR.

Exclusion Criteria

- Children who tested negative for Covid-19 by RTPCR.
- Population less than 1 month and above 18 years of age.

Statistical Analysis

Data was analysed using IBM SPSS ver20. Continuous variables were tested using Mann-Whitney U test. P value <0.05 was considered statistically significant.

Results

Table 1: Baseline characteristics of children with covid 19

Characteristic	Number (percentage)
Age	<1
1-5	8 (15%)
5-10	17 (33%)
>10	12 (23%)
	14 (27%)
Sex	
Female	20
Male	31
M: F Ratio	1.55
Contact with Covid-19 positive patient	6 (11%)
Comorbidities	
Seizure disorder	3 (6%)
Bronchial Asthma	1 (2%)
Nephrotic syndrome	1 (2%)
Systemic Involvement	
Central Nervous System	14 (27%)
Cardiovascular System	-
Respiratory System	21 (41%)
Gastrointestinal System	8 (16%)
Skin and Subcutaneous Tissue infection	2 (4%)
None	6 (12%)
Clinical Features	
Asymptomatic	6 (12%)
Fever	36 (70%)
Cough	17 (33%)
Difficulty breathing	10 (20%)
Seizures	14 (27%)
Vomiting	3 (6%)
Loose stools	4 (8%)
Pain Abdomen	4 (8%)
Headache	1 (2%)
Rash	1 (2%)
Neck Swelling	1 (2%)
SIRS Parameters	
Pulse Rate	16 (31%)
Respiratory rate	10 (20%)
TLC (<4000/>11000)	20 (39%)
Temperature (>101.3/<96.5)	36 (70%)
Outcome	
Discharged	50 (98%)
Expired	1 (2%)

Respiratory system (41%) was most commonly involved and fever (70%) was the most common symptom observed.

Table 2: Lab Markers of children

Variable	Minimum	Maximum	Mean	SD
Hemoglobin (g/dl)	6.7	14	10.7	1.7
Hematocrit (%)	18	44	31.8	5.2
TLC (Total leucocyte count) (/mm ³)	9700	27610	10398	5155
Platelet Count (/μl)	0.5	7.3	3.2	1.5
ESR	8	84	27	14
Urea (mg/dl)	10	98	27	15
Creatinine (mg/dl)	0.2	2	0.5	0.2
S. Bilirubin (mg/dl)	0.2	1.6	0.5	0.2
SGOT (U/L)	10	299	51	40
SGPT (U/L)	12	360	47	52
Sodium (meq/L)	129	159	139	5.2
Potassium (meq/L)	0.2	5.7	3.9	0.9
Calcium	0.8	1.3	1.1	0.1
Duration of hospital stay (days)	2	21	6	3

Table 3: Relation with covid contact

Lab Parameter	h/o covid contact		Proportion of children having abnormal values, n (%)
	Present	Absent	
Anemia	3 (11%)	25 (89%)	28 (55%)
Leukopenia	1 (2%)	2 (4%)	3 (6%)
Leukocytosis	1 (2%)	16 (13%)	17 (33%)
Thrombocytopenia	0	6 (12%)	6 (12%)
Thrombocytosis	2 (4%)	8 (16%)	10 (20%)
Raised ESR	36 (71%)	6 (12%)	42 (83%)
Deranged urea	1 (2%)	9 (18%)	10 (20%)
Deranged creatinine	0	2 (4%)	2 (4%)
SGOT	3 (6%)	26 (51%)	29 (57%)
SGPT	1 (2%)	13 (25%)	14 (27%)
Hyponatremia	0	6 (11%)	6 (11%)
Hypernatremia	0	4 (8%)	4 (8%)
Hypokalemia	1 (2%)	7 (14%)	8 (16%)
Hyperkalemia	3 (6%)	9 (18%)	12 (20%)

Table 4: District wise distribution of cases

District	History of covid contact		Total Cases
	Present	Absent	
Chamoli	-	15 (29%)	15 (29%)
Pauri	5 (10%)	12 (23%)	17 (33%)
Rudraprayag	-	8 (16%)	8 (16%)
Tehri	1 (2%)	10 (20%)	11 (22%)

Discussions:

The clinic-etiological profile of Covid-19 in children has been a subject of significant interest and scrutiny since the onset of the pandemic. This study sought to shed light on the clinical characteristics and outcome of Covid-19 cases among this particular population.

In our study the most common age group involved was from 1-5 years of age. Although most of the other studies included patients upto 12 years of age, age group commonly involved in them were consistent with our study. A study done by Sarangi B et al ^[3] found that children less than five years of age accounted for nearly half the cases. Jat KR et al ^[4] concluded that among all the children admitted due to covid-19 infection, median age was 7 years. A preliminary report on COVID-19 conducted in a tertiary care hospital in West Bengal found a median age to be 1 year ^[5]. In a study done by Pande N et al ^[6], the median age of presentation was 2year.

Males were more commonly affected than females in our study maybe because being in hilly regions, illness in males were sorted out earlier for treatment as compared to females or because of more exposure of males to others compared to females. The study by Jat KR also found more male to female ratio. Gosh T et al ^[7] conducted a study on clinical profile and in hospital outcome among adolescents and found similar gender involvement.

Respiratory system was most commonly involved followed by central nervous system, gastrointestinal system and skin and subcutaneous system in our study. Fever (70%) was the most common symptom followed by cough (33%), seizure (27%), difficulty in breathing (20%) in our study which was similar to other studies done in Covid-19 positive children. Asymptomatic cases were 12% in this study. Fever was the chief complain present in 34% of patient admitted in tertiary care hospital in Pune ^[3]. Fever was also the most common symptom in the study done by Jat KR. Fever (14.9%) and cough (14.9%) were the most commonly encountered symptoms in a study done in adolescents by Ghosh T et al. Fever (32%) was the most common symptom followed by cough (19%), rapid breathing (13%), diarrhea (10%) and vomiting (10%) in a study done by Nallasamy K et al ^[8]. Fever and cough were the most common symptoms according to a systematic review ^[9]. Asymptomatic infection in 19.3% ^[10] and 18% ^[11] children respectively was found in 2 systematic reviews. Most of the asymptomatic cases were not admitted and were isolated in special covid care centres, this can be the reason for reduced number of asymptomatic cases in our hospital. Other reason can be that asymptomatic cases were not tested and therefore might have remained undetected. As Covid-19 primarily involves respiratory system, fever and cough remain the most common symptoms associated with it.

10% of patients had underlying disease in this study, of which seizure disorder (6%) was the most common followed by Bronchial Asthma (2%) and Nephrotic syndrome (2%). Usually severe cases of Covid-19 are less common in children compared to adults and the outcome is usually favourable. The pattern of severity of illness in our study was similar to other studies. Majority of the patients admitted were mild cases. 2 patients had severe disease, 1 of which faced lamentable demise while the other who was a known case of steroid resistant nephrotic syndrome recovered successfully leading to discharge. Most of the patients had mild to moderate disease and only 4% had a severe or critical illness according to a systematic review and meta-analysis ^[12]. As a peripheral healthcare centre, it is possible that sick patients were

directly transferred to higher centres with more extensive facilities. Therefore, this data is based on the patients that were admitted to our hospital from this hilly region of Uttarakhand.

Mean duration of hospital stay was 6 days in our study. In a study done by Singh P et al mean duration of hospital stay was 8 days. Median days of hospital stay was 15 days in a study by Nallasamy K et al. Raised ESR was found in 83% of Covid-19 positive patients admitted to this hospital. 45% had CRP positive, anemia in 55% patients, leukopenia in 6% and leucocytosis in 33% patients, deranged SGOT and urea in 57% and 20% patients. Similar result was found in study done by Nallasamy K et al where elevated CRP was found in 43% patients. Patients with severe and fatal disease have significantly increased white blood cell (WBC) count, and decreased lymphocyte and platelet counts compared to non-severe disease and survivors^[13]. High baseline levels of CRP, ferritin and LDH and an NLR ratio of ≥ 3.5 along with hypo-albuminemia and deranged baseline creatinine, indicating severe COVID-19 related illness^[14]. In the study done by Singh P et al, two-third of the children had abnormal blood counts; leucocytosis (55%) was more commonly reported than leukopenia (12%).

Conclusions

The present study concluded that the infection in children is usually mild, with low mortality rate (2%). Respiratory system was most commonly involved and fever and cough were the most common symptoms.

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