ORIGINAL RESEARCH PAPER

Paediatrics

SYMPTOMATIC PATTERN IN PEDIATRIC COVID-19 IN GOVERNMENT MEDICAL COLLEGE SRIKAKULAM

KEY WORDS: Pediatric, symptomatic pattern, COVID-19

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ABSTRACT

BACKGROUND: COVID-19(corona virus disease 2019) caused by new novel corona virus SARS-CoV-2(severe acute respiratory syndrome corona virus 2),a pandemic which is major public health crises associated with significant morbidity and mortality. Children are affected fewer and milder relative to adults. But recently the trend has been changing, reports of children with COVID 19 are increasing. **OBJECTIVE:** To assess symptomatic pattern in pediatric COVID-19. **STUDY DESIGN:** A retrospective analysis using data of 32 children aged 1 month to 12 years diagnosed with COVID-19 between May1, 2020 and October 31, 2020 at Government General Hospital, Srikakulam, Andhra Pradesh, India. **RESULT:** All children under study have positive epidemiological history. Of which 24(24/32-75%) have positive family history of either affected person or health care worker with positive contact history, 20 of them(20/32-62.5%) were asymptomatic and been advised strict home isolation and managed under ambulatory basis. 37.5%- 12 children with mild disease, the presenting features - only fever 25%(3/12 children), only cough 33.3%(4/12 children), fever and cough 33.3% (4/12 children),fever with gastrointestinal symptoms 8.3%(1/12 children). Of which 8 children(8/32- 25%) were admitted,5 (5/32) had leukopenia, 2 (2/32) had thrombocytopenia. Infant and young children were more commonly affected than the older children .<1yr - 5(15.62%) ,1-5year -19(59.37%),5-12 year-8(25%). **CONCLUSION:** Pediatric COVID-19 is often family acquired. Most are asymptomatic and therefore the risk of propagation is high, hence it is essential to screen all the children with high index of suspicion .Prognosis is better in children with low fatality rate. Follow-up of all children were done till date and no adverse outcomes post COVID-19 were observed.

BACKGROUND

Corona virus disease 2019(COVID-19), a pandemic caused by severe respiratory syndrome corona virus 2(SARS-CoV-2). The outbreak was first identified in Wuhan,China which was thought to be originated from Bats and was transmitted to humans through unknown intermediary host[1]. SARS-CoV-2 is seventh member of enveloped ssRNA human corona virus[2]. At present the virus has affected >200 countries globally ,by october 31st,2020 45.24 million people were affected and deaths accounted to 1,183,788[3]. All age groups of people are susceptible to the virus,but data till now shows that pediatric age group is less often and less severely affected than adult[2]. Transmission of the disease is through inhalation of droplets of infected person or touching the surfaces, fomites contaminated with the virus. The incubation period ranges from 2 to 14 days with an average of 4-6 days. The pathophysiology of the disease occurs in 3 stages

1- Entry of the virus and replication
2- Spread to the lungs and other systems
3- Hyperimmune response phase

The virus attaches to the ACE2 (Angiotensin converting enzyme)receptors on epithelial cells and gain entry and start replication.ACE2receptors are more found in nasal , oral and gastrointestinal mucosa .So initially the infection starts as acute upper respiratory tract infection but can progress to multi organ involvement with unique and unusual clinical presentations based on distribution of ACE2receptors. Most common symptom in adults is fever , others include cough, shortnessof breath, loss of appetite, fatigue, sputum production, muscle and joint pains. Clinical picture is variable in children unlike adults with most cases being asymptomatic and are milder. Hyperimmune phase is not seen in all individuals , possibly related to an abnormal or variant host immune response[4].

OBJECTIVE

The objective of our study is to study the symptomatic pattern in pediatric COVID-19 cases.

MATERIAL AND METHOD: Our study is a retrospective analysis,which included 32 children aged 1 month to 12 years diagnosed with COVID-19 between 1st May 2020 and 31st October 2020 ,at Government general hospital, Srikakulam, Andhrapradesh. Inclusion criteria are children of age >1month and <12 years,children tested positive for RT-PCR at Government general hospital, Srikakulam,both groups of children who were advised home isolation and who were advised hosptial admission. Exclusion criteria are children <1 month age, >12 years ,children who could not make upto follow up.

DATA COLLECTION: The data regarding demographic, clinical, laboratory, radiological and therapeutic information has been obtained from medical records,the area of residence,the history of contact with positive cases or presence of health careworker who examined positive cases, the date of onset of illness in symptomatic cases were also recorded. Laboratory results include complete blood counts, blood biochemistry, inflammatory markers like c-reactive protein, procalcitonin,which were routinely done in all cases at time of diagnosis. IL-6, D-Dimers, coagulation profile were advised in hospitalized children . Routine x ray chest at the time of diagnosis. The need for CT imaging was not present during our study. Discharge was given after negative for RT-PCR and free of symptoms. Follow up of all children was made regularly once every 2 weeks.

RESULTS

DEMOGRAPHIC

All 32 children had positive epidemiological history, 24 out of 32 children had positive family history - 20 have history of positive family member and 4 had health Care worker who positive examined positive cases. 5 out of 32 are aged 1month

to 1 year,19 out of 32 are between 1 year to5 year and 8 out of 32 are above 5 year and <12 year . Among 32 children 17 are males and 15are females.

CLINICAL CHARACTERISTICS

In our study 20 out of 32 are asymptomatic, 12 are symptomatic of which only 8 were
Required hospital admission and rest of the 24 were advised strict home isolation and managed under ambulatory basis. Of 12 symptomatic children - with mild disease 3 children had only fever, 4 had only cough, 4 had fever with cough and 1 child had fever with gastrointestinal symptoms.

LABORATORY FINDINGS

Laboratory test in all cases who were advised home isolation were normal, no abnormalities were detected, of 8 admitted cases 7 had increased levels of c-reactive protein ,5 of them had leukopenia, 2 had thrombocytopenia . No other hematological abnormalities were recorded.

RADIOLOGICAL STUDIES

No radiographical abnormalities were noticed among all children who were advised home isolation as well as hospital admission.

Table 1: Brief view of the above statistical analysis

Characteristic	Number of children /total	Percentage(%)
Age	(Total children =32)	
1month- 1 year	5/32	15.62
1year -5 year	19/32	59.37
5 year- 12 year	8/32	25
Gender	(Total =32)	
Males	17/32	53.12
Females	15/32	46.87
Positive family history	24/32	75
Clinical findings		
Asymptomatic	20/32	62.5
Symptomatic	12/32	37.5
Fever only	3/12	25
Cough only	4/12	33.3
Fever with cough	4/12	33.3
Fever with GI s/s	1/12	8.3
Admitted cases	8/32	25
Laboratory findings	(Total children =32)	
Increased crp levels	7/32	21.87
Leukopenia	5/32	15.62
thrombocytopenia	2/32	6.25

DISCUSSION

From our study we found that relatively fewer children were affected over durationof 6 months which is mainly due to minimal exposure to outside , home isolation , healthy respiratory tract, minimal co-morbidities that decreased overall morbidity and mortality. All children had positive epidemiological history,most of the children affected have positive family history , thus suggesting that close contact within family is likely mode of infection in pediatric COVID-19 infection. So prevention and control of the disease in children mainly depends upon family efforts like strict isolation from children, well hygiene practices,repeated surface and fomite disinfection, which look very simple yet have a major role in prevention . Infants and young children are more commonly affected than older children as it is difficult for infants and toddlers to put on masks and have self-disciplined behaviour ,so parents should also focus on their child's safe practices along with their's.

More than half of the children in our study had no symptoms but were tested as a part of screening process due to positive contact within household, nearly one third of cases had symptoms of which most common are fever and cough followed by sneezing, rhinorrhea, vomiting, diarrhoea. No child had dyspnea, respiratory difficulty, fatigue, joint pains, muscle pain, abdominal pain, rash over body. This show that symptomatic pattern in pediatric covid19 greatly differs from that of adult in terms of severity of infection as well, because of qualitatively different immune response like 'immunosenescence' and ' inflammaging'. Thus we concluded that pediatric covid-19 is asymptomatic or a mild clinical illness. No child was identified to have chronic medical conditions like heart disease, lung disease CNS disease.

Laboratory studies in our study revealed that total leukocyte counts in almost all children were normal only few 5of 32 had leucopenia , CRP was elevated in 7 cases, all of them were admitted cases with mild disease,very rare finding of thrombocytopenia was identified in 2 children who were among admitted. No other hematological abnormalities were recorded, No child had radiological abnormality suggestive of pneumonia or any other LRTI and ultimately it shows that laboratoryand radiographical testing in children yields no specific result and offer no diagnostic or therapeutic support in pediatric covid-19.

Resolution of fever without use of antipyretics and improvement in respiratory symptoms and /or negative result of respiratory specimen for RT-PCR are considered as signs of recovery4. Follow up of children was carried out once every 2 weeks post discharge till date for identification of post COVID-19 complications like multisystem inflammatory syndrome, atypical kawasaki disease, or toxic shock syndrome usually occur after 30-45 days after infection as reported in some studies, but no reason is yet identified[5].

Recent studies have reported occurence of multisystem inflammatory syndrome in children (MSI-C) also known as pediatric inflammatory multisysytem syndrome, hyperinflammatory condition, a new disease assosciated with COVID-19 .

The asymptomatic children can also develop MIS-C in due course of time,3-4 weeks after infection ,when many children are negative for RT-PCR at time of evaluation and are positive for antibodies. Clinical signs and symptoms include multiple system involvement. Fever is seen in all cases, along with myalgia, fatigue, lymphadenoapthy ,gastrointestinal symptoms are vomiting, diarrhea, severe pain abdomen, loss of appetite, respiratory findings like dyspnea, shortness of breath, cough, rhinorrhea, nasal congestion, neurological like headache, dizzines, altered mental status, lethargy, fussy, dermatological like rash , edema of extremities , other like conjuctivitis, chelitis, tongue swelling, sore throat. Laboratory features consistent. with elevated multiple inflammatory markers, extremely elevated are procalcitonin, IL-6, troponin. Neutrophilia and lymphocytopenia are frequent,which progresses rapidly to shock and cardiorespiratory failure. So, prompt recognition and immediate management are necessary to prevent fatal outcomes as most children require ICU admisson. MSI-C have overlapping features with that of Kawasaki Disease and TSS Toxic shock syndrome, inflammatory storm in MSI-C is much more intense , can be differentiated by clinical findings like age , vomiting, diarrhea, and abdominal pain. Kawasaki disease is seen more in youngchildren < 5 years with prelidiction to asian males whereas there is no gender preference in MSI-C, with mean age being 9 years[6]

CONCLUSION

Here by we conclude from our study that pediatric COVID-19 often family aquired. Most are asymptomatic and therefore the risk of transmission is high ,hence all children with high index of suspicion are to be screened for COVID-19.Pediatric COVID-19 has better prognosis with relatively low morbidity and mortality compared to adults. Follow up of all children of our study till date had shown no adverse outcomes or post

COVID-19 complications .

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