The Nutritional Preponderance and Propensity to COVID-19 in Children

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ABSTRACT

Aims & Objectives: Nutrition plays a very important role in the Immunity and Immunoregulation in children. The risk of acquiring an infection is very high in malnourished and underweight children, which is what we venture out to find out in our study by researching the susceptibility for COVID-19 in children and comparing it with their nutritional status.

Materials & Methods: Our Tertiary Childrens hospital had 46 COVID positive children admitted in 2020, the nutritional status analysis, showed that there were four children 8.6% (n=4) in Obese category, 19.5%, nine (n=9) children were Overweight, 17.39 %, 8 children Underweight (n=8) and 25 children were 54.3% well nourished.

Results: This case series describes the various features in COVID-19 in children with and without co-morbidities primarily focusing on the nutritional profile. This is the first single centre case series globally on COVID-19. Our cohort showed no significant relation between COVID-19 and the nutritional status. We saw an equal distribution of COVID-19 in children irrespective of their nutritional status at admission.

Conclusions: We did not notice any statistical significance in the age group or the nutritional status in children infected with COVID-19

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Introduction

Covid19 was declared a pandemic by the WHO in 2020 and has led to major casualties worldwide both in the developed and developing nations alike. There have been wide major calamities in the old age and in people with co-morbidities. Lockdown was imposed in several parts of the world and this led to major setbacks in the economy and a severe burden to the health systems and panic was wide stricken. Major breakthroughs in the treatment have been implemented and researched but vaccines have made a stall to the spread of the disease and in breaking the chain. COVID-19 infection in children has always been a major concern and there have been multiple hypothesis in why children don't get infected as much as adults and have minor illnesses and are called as "super-spreaders". Ever since the WHO declared COVID-19 as a pandemic-pediatricians have been cautious and have been monitoring both the evolution of the virus and the disease to see how the speculated 3rd wave may affect children.

Background and Methods

It is estimated that approximately 36.6% of the Indian population is in the age group of 0-18 Years [1]. 3,91,256 people were tested positive for COVID-19 in India until the 9th September 2021 [2].The total number of cases diagnosed in the year 2020 were mounting to 10,23,856 among the general population and among this there were 0.5% children who tested positive [3]. We endeavored to find out if there was a correlation between children diagnosed with COVID-19 and their nutritional status.

Children show a wide panorama of symptoms from mild to severe manifestation of disease and it may range from mild respiratory illness to acute respiratory failure [4]. Apollo Childrens Hospital is a tertiary Children's Hospital in South India and deals with around 20,000 outpatients per year and our inpatient services range from medical, surgical, oncology including the care of sick neonates. We did a retrospective data analysis of all COVID positive children who were admitted as inpatients at Apollo Childrens Hospital Chennai and we looked at various parameters including their anthropometry, demography, co-morbid conditions, nutritional status as per WHO growth chart, COVID PCR results, CT value, admissions to intensive care and clinical outcomes among various other parameters. Our analysis included patients with diagnosis with MIS – C (Multi Inflammatory Syndrome in Children).

Methods

Data that was collected from the medical notes were analyzed using Microsoft Excel. Our center was a designated COVID care center for children where we handled about 46 COVID positive children in the calendar year 2020. Our total number of COVID positive children the 46 of which males were 30 (65.2%) and 16 (34.7%) were females. Our Major area of focus was the nutritional profile of children who presented with a diagnosis of COVID-19.

Results

Demographics

Out of the 46 children who were admitted 26 children were from Chennai and 20 children were from other states.

Nutritional analysis and Anthropometry

The mean weight of children was 23.73 kg and the mean height was 104.73 centimeters. The mean BMI score of children was 17.68 the mean Z score for weight what is-1.50 and the mean Z score for height was -2.29.The mean score for BMI was 0.14. (Table 1) The nutritional status analysis showed that there were four children 8.6% (n=4) in Obese category, 19.5%, nine (n=9) children were Overweight17.39 %, 8 children Underweight (n=8) and 25 children were 54.3% well nourished. (Figure 1)

Table 1: Showing the nutritional status in our cohort
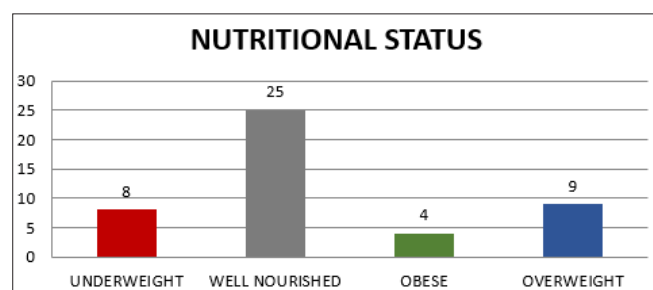
Co-Morbidities

Out of the total 46 patients who presented to us with a COVID positive diagnosis -16 (53.3%) of them had comorbidities. Among the 16 children with comorbidities, their disease spectrum varied from pre-existing heart disease, vesico-ureteric reflux, epilepsy, prematurity etc. Interestingly in our cohort-none of them had any pre-existing lung disease or were immuno-compromised or immunosuppressed. The major presenting feature of children in our cohort was fever34 children had fever, three (n=3) children presented with first episode of febrile convulsion and subsequently were diagnosed to be COVID positive and six children (N=6) presented with shortness of breath. Out of the six children three (n=3) children had pre-existing asthma and were on inhalers Budesonide and Salbutamol for their diagnosis of asthma.

Analysis of RT PCR Results

All COVID RT-PCR tests were conducted with the Taq Path Combo kit from Thermo Fisher [5]. USA, which is FDA approved-which claims a sensitivity and specificity of 100%.There was a total of 37 children who were tested positive for COVID-19 and the mean Ct (Cycle Threshold) value of these children was 23. The rest of the children (n= 4) had antibodies positive and had COVID before preceding the presentation of the current illness. Five children had equivocal results from the RT-PCR (n= 5).

Admission and Recovery

Out of the total 46 children were admitted as inpatients, the average length of stay (LOS) of the children were 3.3 days, the longest stay was recorded for a period of 26 days in a child who had a road traffic accident with multiple injuries and was incidentally found to be COVID positive and he had no recorded complications due to the COVID infection. Three children were admitted to Intensive care for various reasons and out of which three children received Remdesivir, (3/46),There were Four (n=4) children who were treated with methylprednisolone, aspirin and low molecular weight heparin.

Discussion

This is the first case series from India on COVID-19 in children from a single center. This series describes the various features in COVID-19 in children with and without comorbidities primarily focusing on the nutritional profile. Our cohort showed no significant relation between COVID-19 and the nutritional status. We saw an equal distribution of COVID-19 in children who were overweight, underweight and malnourished categorically. While there lot of studies connecting the effect of nutrition during and post COVID there are No studies that connect the risk of nutrition and susceptibility to COVID-19 in children. Although our cohort is small. Our study is the first to correlate nutrition and COVID-19 in children. We did not notice any statistical significance in the age group or the nutritional status in children infected with COVID-19.

References

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