Pattern of childhood illnesses seen before and during COVID-19 pandemic at children out-patient clinic of a tertiary health facility in Enugu, South-East Nigeria: An observational study

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Abstract

The COVID-19 pandemic is a worldwide threat. Currently, all attention is focused on defining the disease, its presentation, treatment, and prevention, with little thought given to the impact of this disease on the prevalence and pattern of other diseases that pose health challenges. This study was a retrospective and observational study of the pattern of cases presenting at the Children Out-Patient (CHOP) Clinics of Enugu State University Teaching Hospital Parklane (ESUTHP) from five months before COVID detection to five months after COVID detection (COVID era). Clinical data from the clinic register, including age, gender, and diagnosis, was retrieved and recorded in an excel sheet before being transferred to SPSS version 20 for analysis. A total of 9377 children attended CHOP Clinics (6094 in the pre-COVID-19 era and 3283 in the COVID-19 era), representing a significant decrease in total clinic attendance in the COVID-19 era. During the study period, there was a 50% reduction in the number of cases (diseases and follow-ups) documented from children attending clinics (pre-COVID-19 era, 4596 and COVID-19 era, 2367), indicating a significant reduction in the prevalence of these cases during the COVID-19 period. The prevalence of cases seen during the COVID-19 era was significantly lower than in the pre-COVID-19 era. This observed reduction could be attributed to COVID-19 control measures implemented in the hospital during the COVID-19 era. As a result, it is recommended that these measures be maintained in order to further reduce the prevalence of these cases even after COVID-19.

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Informed consent: Written informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article.

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Introduction

Coronavirus disease, also known as COVID-19, is one of the most common communicable diseases currently ravaging the world, with disastrous consequences for health, education, the economy, and tourism.

COVID-19 is caused by a novel virus, SARS-CoV-2, and is primarily transmitted through respiratory droplets from direct contact with infected people or through contact with contaminated objects and surfaces.[1-4] It typically manifests as flu-like symptoms such as fever, cough, sneezing, sore throat, and headache.

In December 2019, the disease was first reported in Wuhan, China. Following the first few reported cases, the SARS-CoV-2 virus infection quickly spread across the globe, prompting the World Health Organization (WHO) to declare it a global pandemic on March 11th, 2020.[5] Over 235 million confirmed cases and more than 4.8 million deaths have been reported worldwide, with the USA having the highest number of viral infections and COVID-19-related deaths, followed by Brazil and India.[5] The ongoing vaccination against the SARS-CoV-2 virus around the world is a welcome development because it has been shown to significantly reduce the severity of the disease, hospitalization rates, and deaths among fully vaccinated individuals.[6]

The first COVID-19 case reported in Africa was in Lagos,

Nigeria, in March 2020. The infection quickly spread to several other states across the country. In response, all states imposed a lockdown or curfew to prevent the virus from spreading. Except for those on essential duties, all citizens were told to stay at home and practice good hand washing hygiene; local and international travel was restricted; businesses, offices, public gatherings, schools, and universities were closed; and public and private sports were canceled.[7] Although hospitals were open during this time, most of them limited their services to non-emergency situations. The goal of this strategy was to reduce the additional burden of health challenges that this pandemic would have imposed on citizens. A review of previous COVID-19 studies in Nigeria revealed that most of the studies focused on the clinical presentation of COVID-19 affected children without determining the impact of the pandemic on the prevalence of other communicable and non-communicable diseases, which have previously been the common health challenges confronting the survival of children in developing countries such as Nigeria.[8,9] Most health facilities' material and human resources were largely channeled toward containing the COVID-19 pandemic, leaving one to wonder what happened to the pattern of diseases that had always been a threat to the survival of children in our environs. The purpose of this study was to examine the pattern of cases in CHOP before and after COVID, as well as to see if there was any significant variation in the distribution of cases between these periods.

Materials and Methods

Study area

The Children Out-Patient (CHOP) Clinics of Enugu State University Teaching Hospital Parklane (ESUTHP) Enugu in Enugu State, South East Nigeria, were used for this study. ESUTHP is a tertiary health facility that serves Enugu state and its surrounding areas. It is a major referral center that provides comprehensive tertiary health care at subspecialty levels in a variety of medical fields. It also serves as a training facility for the National and West African Postgraduate Medical Colleges, where resident doctors in various fields of medicine, including pediatrics, are trained. Children's Out-Patient Clinics provide clinical services to children who present with non-emergency conditions. It is also used for cold case follow-up and subspecialty clinics for consultants. It is open from 8:00 a.m. to 4:00 p.m., Monday through Friday. Each clinic day is staffed by a Consultant(s), Resident doctors training with the unit, nurses, and other support personnel.

Study design

This is a retrospective, observational, and analytical study of the pattern of various clinical cases that presented at the ESUTHP children's out-patient clinics from five months before COVID-19 detection (*i.e.*, 1st October 2019 to 28th February 2020) and five months after COVID-19 detection (COVID-19 era, *i.e.*, 1st April 2020 to 31st August 2020). The retrospective epidemiological data on the various clinical cases that presented at CHOP were compiled using an excel sheet. The data was gathered from the daily Clinic attendance summary book, which is usually completed by Clinic Nurses. The variables collected include age (years), gender, date of clinic visit, and clinical diagnosis as recorded in the attending doctor's case files. A paid research assistant collected the data. The data was analyzed with SPSS Version 20 to show the period of presentation (pre-COVID and COVID era), age distribution, and clinical case distribution within the study period.

Results

During the study period, a total of 9377 children presented to CHOP clinics [pre-COVID-19, 6094 (70%) and COVID-19, 3283 (30%)], representing a significant decrease in total clinic attendance in the COVID-19 era as documented in the Nurses' attendance register (p = 0.006). A similar significant reduction was observed across all age groups (p 0.001; Table 1).

A total of 4596 cases (diseases and follow-up) were attended to from the 6094 children who presented during the pre-COVID era, as documented by the medical team. The remaining 1,498 cases lacked records. Among the 3283 cases that presented during the COVID era, the medical team attended to a total of 2367 cases. The remaining 916 cases had no records. Thus, the number of cases seen prior to COVID was reduced from 4596 to 2367 during the COVID era, a reduction of approximately 50% (Table 2). Upper respiratory tract infection (28.1%), malaria (24%), gastroenteritis (6.0%), refractive errors (4.8%), and follow-up were the most common cases seen at CHOP prior to COVID. Urinary tract infection (1.7%), scabies (1.5%), ottitis (1.4%), tonsillitis (1.4%), dermatitis (1.3%), and impetigo (1.0%) were the next most common. lower respiratory tract infection (0.6%), bronchial asthma (0.6%), atopic dermatitis (0.8%), helminthiasis (0.7%), conjuctivitis (0.9%), sickle cell anaemia crisis (0.2%), sepsis (0.3%), umbilical hernia (0.2%), lipoma (0.1%), inguinal hernia (0.1%), cellulitis (0.2%), and atopy (0.8%) were less than. It is worth noting that pre-COVID cases such as anal fissures, malnutrition, and cardiac arrhythmias were almost non-existent. During the COVID

Table 1. Distribution of clinical attendance by gender and age at pre-COVID-19 and COVID-19 era.

Variables	Pre-COVID-19 n (%)	COVID-19 n (%)	X^2	p-value
Gender				
Male	3148 (66.3)	1598 (33.7)	7.59	0.006*
Female	2946 (63.6%)	1685 (36.4)		
Age (years)				
< 1	1486 (70.7)	617 (29.3)		
1-3	974 (72.3)	374 (27.7)		
4-5	533 (54.4)	447 (45.6)	136.52	<0.001*
6-12	1009 (61.4)	633 (38.6)		
13-18	637 (58.8)	447 (41.2)		

*=Statistically significant at p<0.05.

era, a similar pattern of cases was observed, though at a lower proportion. Upper respiratory tract infection (11.1%), malaria (23.8%), gastroentritis (2.5%), refractive errors (10.8%), and follow-up (36.1%) were also major cases during this time period. Ottitis (1.4%), tonsilitius (1.4%), conjuctivitis (1.3%), and impetigo (1.1%) followed. Bronchial asthma (0.2%), dermatitis (0.7%), helminthiasis (0.1%), sepsis (0.6%), umbilical hernia (0.2%), cellulitis (0.5%), and atopy (0.9%) accounted for less than 1% of cases in this era. LRTI, malnutrition, atopic dermatitis, SCA crisis, lipoma, hydrocele, inguinal hernia, anal fissures, and cardiac arrhythmias were not observed during the COVID era.

Figure 1 depicted a sharp decline in clinic attendance at CHOP from February 2020 to a low point in May 2020, after which attendance gradually increased but never returned to pre-COVID levels during the study period. As shown in Figure 2, the mean number of URTI cases fell sharply from February 2020 to the lowest level ever recorded in May 2020. Following that, it gradually began to rise, though not to pre-COVID levels.

Figure 3 depicted the disposition of cases who came to CHOP for follow-up visits during the study period. It fell steadily beginning in December of 2019, reaching its lowest point in March of 2020, after which it gradually increased but fell short of the peak pre-COVID level.

Discussion

The COVID -19 pandemic has had a significant impact on the health, social, and economic lives of people all over the world.

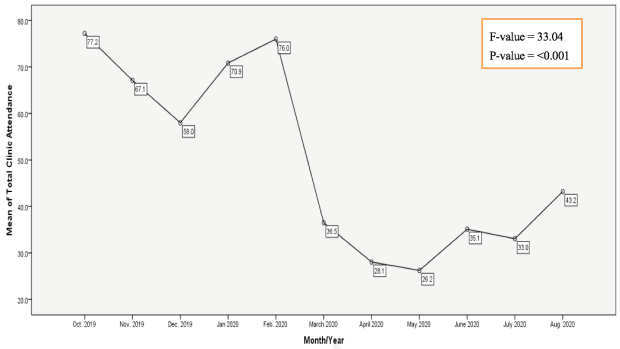

Figure 1. Mean plot of clinic attendance from October, 2019 to August, 2020.

Table 2. General distribution of diseases at pre-COVID-19 and COVID-19 era.

Variables	Pre-COVID-19		COVID-19		Overall		P value
	N	%	N	%	N	%	
URTI	1293	28.1	263	11.1	1556	22.3	<0.001*
LRTI	27	0.6	0	0.0	27	0.4	<0.001*
Malaria	1101	24.0	563	23.8	1664	23.9	0.875
Malnutrition	1	0.0	0	0.0	1	0.0	*1.000*
Bronchial Asthma	28	0.6	5	0.2	33	0.5	0.022*
Dermatitis	58	1.3	17	0.7	75	1.1	0.037*
Gastroenteritis	275	6.0	60	2.5	335	4.8	<0.001*
Atopic dermatitis	39	0.8	1	0.0	40	0.6	<0.001*
Helminthiasis	34	0.7	2	0.1	36	0.5	<0.001*
Ottits	65	1.4	33	1.4	98	1a.4	0.946
Conjunctitis	41	0.9	30	1.3	71	1.0	0.140
Refractive Error	221	4.8	256	10.8	477	6.9	<0.001*
SCA Crisis	10	0.2	0	0.0	10	0.1	*0.002**
Sepsis	16	0.3	15	0.6	31	0.4	0.090
Scabies	67	1.5	54	2.3	121	1.7	0.013*
Impetigo	44	1.0	26	1.1	70	1.0	0.576
Umbilical hernia	9	0.2	4	0.2	13	0.2	*1.000*
Lipoma	4	0.1	0	0.0	4	0.1	*0.307*
Hydrocoele	2	0.0	0	0.0	2	0.0	0.551
Inguinal hernia	4	0.1	0	0.0	4	0.1	*0.307*
Anal fissures	2	0.0	0	0.0	2	0.0	*0.551*
UTI	76	1.7	116	4.9	192	2.8	<0.001*
Cellulitis	9	0.2	12	0.5	21	0.3	*0.025**
Cardiac arryth	1	0.0	0	0.0	1	0.0	*1.000*
Atopy	39	0.8	22	0.9	61	0.9	0.732
Tonsilitis	63	1.4	34	1.4	97	1.4	0.825
Follow-ups	1067	23.2	854	36.1	1921	27.6	<0.001*
Total	4596	100.0	2367	100.0	6963	100.0	

*=Statistically significant at p<0.05; Italicized p-values are Fisher's Exact. Upper Respiratory Tract Infection; LRTI=Lower Respiratory Tract Infection; UTI=Urinary Tract Infections; SCA=Sickle Cell Anemia.

COVID-19 spreads primarily between people who are in close contact with each other, typically within 1 m, and a person can become infected when inhaled aerosols or droplets containing the virus or come into direct contact with the eyes, nose, or mouth.[10,11] As a result, global, federal, state, and local measures were implemented to halt the virus's spread. In our own environment, containment measures included school and workplace closures, bans on religious and social gatherings, cancellation of public events, curfews, movement restrictions, and suspension of interstate and international travel.[12] The importance of public education on the importance of social distancing, hand washing, and the use of hand sanitizers was also emphasized. Emerging reports from other parts of the world show that, in addition to limiting COVID-19 spread, the above containment measures have had an effect on the rate of presentation of other cases in hospitals, particularly communicable diseases.[13-16] This study was conducted against this backdrop to assess how the COVID-19 pandemic and its preventive measures have affected the pattern and distribution of cases seen at clinics.

This study found a significant decrease in the prevalence of communicable diseases. Diseases like URTI, LRTI, Dermatitis, Gastroenteritis, Helminthiasis, Scabies, UTI, and Cellulitis were significantly reduced during the COVID era. As part of preventive measures to contain the virus, the use of face masks, hand washing, and improved hygiene practices may have indirectly contributed to the reduction in the spread of organisms implicated in these communicable diseases. Also, school closures during the COVID era forced children to stay at home, protecting them to some extent from communicable diseases that are known to be prevalent in schools due to their close contact with one another.

This study also demonstrated that the impact of the COVID-19 pandemic and its containment measures extends beyond communicable diseases. The prevalence of non-communicable diseases such as bronchial asthma and SCA crises was found to be significantly lower during the COVID era in this study. This decrease could be attributed to a hospital policy implemented during the COVID era that prohibited emergency cases from being treated. The lack of available protective wears required by the medical team to attend to critically ill children without infecting themselves led to the adoption of this strategic hospital policy.

Surprisingly, the prevalence of refractive errors in children increased during the COVID era. The reason for this increase is unknown. Travel restrictions imposed during the COVID era, as well as the economic downturn experienced during that period, were expected to prevent caregivers and their children from accessing this hospital facility during that period, only to discover that cases of Refractive errors increased during the COVID era. It could also be attributed to the fact that caregivers of these children with refractory errors were confident that their children's complaints bore no resemblance to the common symptoms of COVID-19 and thus readily presented their children to the health facility knowing that they would not be labeled a COVID case and stigmatized.[17-19]

This study had several limitations that were identified. Seasonal variations in some communicable diseases may explain the decrease in some of the cases seen during this period, but this was not taken into account in this study. This study would have been better done as a prospective study rather than a retrospective study, allowing researchers to ask caregivers how much of the COVID-19 preventive protocols they used at home in order to properly determine the role of these COVID-19 preventive measures in containing the infection. This, however, should be researched further.

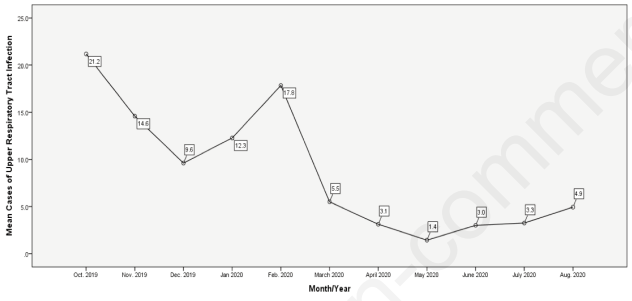

Figure 2. Mean plot of upper respiratory tract infection from October, 2019 to August, 2020.

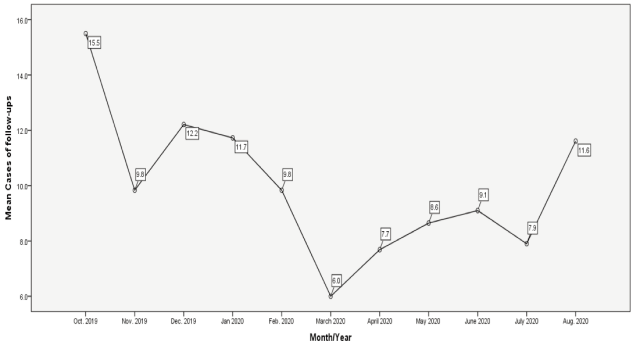

Figure 3. Mean plot of Follow-ups from October, 2019 to August, 2020.

Conclusions

The prevalence of cases seen during the COVID-19 era was significantly lower than in the pre-COVID-19 era. This observed reduction could be attributed to movement restrictions and changes in hospital services during the COVID-19 era. However, it appears that other preventive measures, such as the use of face masks, hand washing, and social distancing during this period, not only slowed the spread of COVID-19 infection, but also slowed the spread of other communicable diseases. Maintaining these preventive measures will thus help to reduce the prevalence of communicable diseases even after COVID-19.

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