

Prevalence And Diagnosis Of Febrile Illnesses In Children Under Five Before And During The COVID 19 Pandemic

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Abstract

Introduction: Febrile illnesses are a common concern among children under five. Whilst prevalence and diagnostic investigations for febrile illnesses in this age group have been extensively studied globally, understanding its specific context in Ghana is crucial, particularly in the face of COVID 19 pandemic which also associated with fever. Incidentally, they contribute significantly to the burden of disease among children in low- and middle-income countries. In Ghana, febrile illnesses are a major health issue among children, leading to a substantial number of outpatient visits, hospital admissions, complications and death. Therefore, understanding true prevalence and diagnostic investigations is important.

Methods: This was a descriptive cross-sectional study with retrospective review of records using complete census of all children under five who had febrile illnesses and visited the Family Health

Hospital within the period of 1st January 2019 to 31st December 2020.

Results: Prevalence of febrile illnesses in 2020 was 825 out of 3,703 attendances of children under 5 representing 22.28% and this was lower than that of 2019 which registered 3,705 febrile illnesses cases out of 6,047 total attendances (61.27%). Malaria, Gastroenteritis, Rhinitis, Enteric Fever and Otitis media were the top five prevalent conditions in both 2019 and 2020 with malaria forming 40.19% and 40.52% for 2019 and 2020 respectively. Referral for diagnostic investigations prior to diagnosis and treatment was high for both 2019 and 2020 representing 77.52% and 75.52% respectively.

Conclusion: The study found the prevalence of COVID 19 was higher in 2019 than 2020. Education of caregivers and early treatment intervention can be undertaken to reduce risk of infection and mitigate adverse health outcomes.

Keywords: Febrile illnesses, COVID 19, descriptive cross-sectional study, complete census, prevalence.

Introduction

The World Health Organization (WHO) had announced on May 5th, 2023, that COVID-19 was no longer a public health emergency of global concern.¹

Though the pandemic is over, certain nuances of its effect such as patronage of health services and delivery of standard care to people, especially to children under the age of five who need a special level of care, have to be explored. One such area is the management of fever-related conditions during the

COVID 19 season. This emanates from the fact that the pandemic had fever as one of its key symptoms. According to Laurence et al., a temperature of over 37.5°C is defined as fever.² The expressions fever, fever-related conditions and febrile illnesses are used interchangeably in this study. This is because they essentially refer to the same thing albeit fever talks about the symptom or sign the patient presents with whilst fever-related conditions or febrile-illnesses more or less are diagnoses which have fever as key components. It is worth emphasizing that even before the onset of the pandemic, the World Health Organization in 2017 had stated that febrile illnesses are a significant public health concern, particularly in low- and middle-income countries where they contribute to a substantial burden of disease among children.³ Similarly, Roddy et al published a study in 2019 which stressed that Severe-Febrile-Illness (SFI) is a common cause of morbidity and mortality across Sub-Saharan Africa (SSA) and that burden of SFI in SSA is currently unknown and its estimation is fraught with challenges.⁴ This is due to a lack of diagnostic capacity for SFI in SSA. In West Africa, the high prevalence of febrile illnesses, including malaria, respiratory tract infections, and diarrheal diseases, pose significant challenges to the healthcare systems.⁴

Furthermore, the Ghana Health Service stated in its 2018 Survey that malaria, which is a major cause of fever, accounts for approximately 30% of all outpatient visits and 20% of all hospital admissions in children under five in Ghana.⁵ One in five children under five (20%), according to the Ghana Statistical Service (2014) had a fever in a survey conducted that same year.⁶ According to Ghana Demographic and Health Survey (2008), fever is most common among children age 12–23 months (26%). Among children who had fever, more than half (51%) were taken to a health facility or provider; 43% took antimalarial drugs; and 25% took antibiotic drugs. Children are most likely to be brought to a health facility in the Upper East region (76%) and least likely in the Central region (32%). Children in the wealthiest households are twice as likely to be brought to a

health facility compared with children living in the poorest households (80% versus 41% respectively). Seeking treatment for children with fever is higher in urban areas and increases with a mother's education.⁷

In a study published in 2022 after a scoping review was conducted from searching through different databases (Medline, Google Scholar, etc.) for original articles published between December 2019 and September 2021, it was revealed that there was a general reduction in the use of health services during the COVID 19 season. It was concluded that the impact of the pandemic on use of primary care services, were unmet health needs and inequalities in access.⁸

Methods

This study was a retrospective review of febrile cases reported in 2019. The data was obtained from the Hospital Automation Management System (HAMS) of the Family Health Hospital (FHH). The period of the study was between 1st January and 31st December 2019 representing the first batch of data for the period before COVID 19 whilst the second batch of data was between 1st January and 31st December 2020 which was during the COVID 19 pandemic seasons. The study site was Family Health Hospital, a private health facility located at Teshie, Accra-Ghana.

The study population comprised of all children whose ages were less than 5 years, attended the Family Health Hospital and had been diagnosed with at least one febrile illness within the study period. Their attendance was by virtue of referral, OPD attendance or emergency. Patients with missing or incomplete data were excluded. Also, patients who reported more than once with the same febrile condition during the period of the illness had their second and subsequent visits excluded, since all the cumulative visits were technically seen together as a single visit.

A complete census of the study population was used to enhance generalizability. A total of 9,752 consisting of 6,047 in year 2019 and 3,705 in 2020 were used for the study. A data abstraction form

was developed from Microsoft Excel purposely to extract the relevant information with the following sub-headings: demographic data such as age, sex, residential location, referral for investigations, and principal diagnosis.

Results

Prevalence of febrile illnesses in 2020 was 825 out of 3,703 attendances (22.28%), which was significantly lower than that of 2019 which had 3,705 cases out of 6,047 total attendances (61.27%)(Figure 1). Malaria, Gastroenteritis, Rhinitis, Enteric Fever and Otitis media were the top five prevalent conditions in both 2019 and 2020 with malaria forming 40.19% and 40.52% for 2019 and 2020 respectively (Table 1). Referral for diagnostic investigations prior to diagnosis and treatment was high for both 2019 and 2020 representing 77.52% and 75.52% respectively.

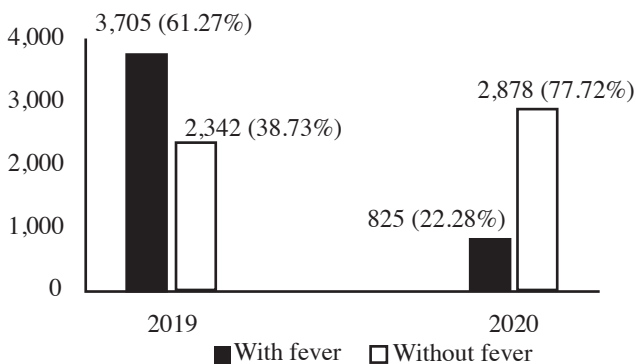


Figure 1 Distribution of prevalence of febrile illnesses among children under 5 for 2019 and 2020

Table 1 Prevalence of febrile illnesses by specific/principal diagnosis

Principal diagnosis	2019 Freq	%	2020 Freq	%
Malaria	2,303	40.19	436	40.52
Gastroenteritis	788	13.75	135	12.55
Rhinitis	745	13.00	88	8.18
Enteric Fever	379	6.61	46	4.31
Otitis media	244	4.26	91	8.46
Acute bronchitis	205	3.58	7	0.65
Sepsis	182	3.18	58	5.39
Urinary tract infection	192	3.35	25	2.32
Bronchopneumonia/chest infection	170	2.97	22	2.04
Tonsillitis	165	2.88	24	2.23
Sepsis	144	2.51	59	5.48
Conjunctivitis	82	1.43	10	0.93
Pyrexia	39	0.68	39	3.62
Otitis externa	33	0.58	17	1.58
Others	59	1.03	19	1.77
Total	5,730	100	1,076	100

Abbreviation: freq, frequency; %, Percent

Table 1 shows the most prevalent febrile illnesses presented at the Family Health Hospital in the years 2019 and 2020. “Others” include diverse diagnoses that appeared relatively less number of times. In 2019, some of the diagnoses in the other session were septic wounds, septic arthritis, parotitis, impetigo, folliculitis, skin sepsis, teething syndrome, pharyngitis, and sinusitis. In 2020, some of the conditions in the “other” category were, acute pharyngitis, skin sepsis, vulvovaginitis, urethritis, and teething syndrome.

Table 2 Referral for diagnostic investigations both years at FHH

	2019 cases	%	2020 cases	%
Number of patients referred for investigations	2,872	77.52	623	75.52
Number of patients not referred for investigations	833	22.48	202	24.48
Total febrile illnesses	3,705	100	825	100

This table shows all subjects who were diagnosed with febrile illnesses with our without confirmation by investigations. In 2019, it was found that 2,872 cases out of total 3,705 febrile illness cases were referred for diagnostic investigations and that represented 77.52%. In 2020, it was also realized that 623 cases out of 825 febrile illness cases representing 75.52% were referred for investigations before final treatment.

Discussion

This current review found that the prevalence of febrile illnesses in 2020 was 22.28% of all attendances, a decrease from 2019, which had 61.27%. Malaria was a significant contributor to these cases. General attendance at Family Health Hospital 2020 was 39% lower than that of 2019. This finding is similar to another study conducted in the UK by Aldridge et al which showed a decline in paediatric emergency by 34%,⁹ Meher et al., also reported a decline in outpatient attendance and indoor pediatric admissions of 60% and 49.8% respectively in India,¹⁰ and Chelo from Cameroun found a decline by 52% in general hospital attendance.¹¹ In Ghana, there was a decline in admissions at the Tamale Teaching Hospital (TTH) by 12% reported by Abdul-Mumin et al.¹² Perhaps, since TTH is a teaching hospital in the Northern region of Ghana and receives more emergencies and referrals from different hospital in the region, the drop was not as high as the 39% drop seen in this study at Family Health Hospital, a private hospital in the Greater Accra region, the southern part of Ghana.

Total prevalence of all forms of febrile illnesses was 61.27% and 22.28% for the years 2019 and 2020 at Family Health Hospital. The prevalence in 2020 declined almost three times that of 2019. The quantum of decline in the number of febrile illnesses far outstripped the drop in attendance in the year 2020. This could be accounted for by the fact that fever was one of the case definitions of the COVID-19, the rest being cough or difficulty in breathing. Parents of the children would prefer to stay home with their children who could be having fever and resort to other means of treatment such herbal or patronage of services from pharmacies as against coming to a hospital where they could contract the disease itself. Another assertion that gives credence to the decline in attendance is the fact that those cases that shared the similar symptoms with COVID 19 such as malaria, bronchopneumonia, rhinitis, and acute bronchitis had dropped. Acute bronchitis declined drastically than bronchopneumonia; perhaps as a result probably it presenting with features that mimicked COVID 19 disease in the perception of many people. Therefore, there was a paradoxical drop, albeit they could have been diagnosed as pneumonia and put on treatment if they sent such children to the hospital. All of that confirmed the report by Assefa et al., which revealed disruptions in access to health facilities and delays in fever diagnosis and treatment as due to fear of COVID 19 exposure.¹³ Other reasons that may be attributable to the decline in the prevalence could stem from morbid fear of getting diagnosed with the COVID 19 disease which would not only be dreadful but the treatment protocol which included quarantine for several weeks could obviously be a nightmare.

In addition, contracting COVID-19 gradually gained notoriety for stigma and name-calling in some communities in Ghana. Another possible reason could be as a result of increased handwashing practices, mask wearing and personal hygiene protocols that were trumpeted by the President of Ghana, heralded by the health agencies and the protocol subsequently integrated into public and private service points to reduce spread of COVID 19. A study by, Breman et al., reported that the prevalence of febrile illnesses contributed to 50% to

childhood morbidity in sub-Saharan Africa.¹⁴ This may be explained by the fact that Breman's study was an average figure from general reports of febrile illnesses in some selected Sub-Saharan African Countries. In other words, it is fair to infer that extremes of low and high cases of febrile illnesses in the various countries were making up the figure of 50% childhood morbidity and not necessarily specific to all countries, including Ghana. In another study conducted in 2023, the prevalence of febrile illnesses involving Sub-sahara African countries was stated as 40.1%.¹⁵ However, with this study, public facilities were the most frequently visited, accounting for 68.1%. A similar reason could be assigned to Dalaba's report published in 2021 which placed prevalence of febrile illnesses at 21%.¹⁶ This is because Kassena-Nankana District in the Northern Region of Ghana, where the study was conducted, has a low socioeconomic dynamics and that may account for low health seeking behaviour.

Malaria, gastroenteritis, rhinitis, enteric fever and otitis media were the top 5 febrile illnesses for both 2019 and 2020. There were not much changes in the diagnoses that came out as a result of febrile illnesses for both studies. Other diagnoses that had relatively lower frequencies however varied between the two years. Malaria was three times as high as gastroenteritis, the second commonest, in both 2019 and 2020. This may be explained by the endemicity of malaria in Ghana and other Sub-sahara Africa countries as corroborated by Kiemde et al., whose study placed malaria first, followed by diarrhoeal conditions.¹⁷ Though Kiemde's study was done in Burkina Faso, Ghana's neighbouring country. This is also not too different from a study by Mensah whose laboratory study in Ghana placed malaria as the main prevalent febrile illness.¹⁸ Perhaps similar febrile conditions exist between the two countries as a result of similar sociocultural and economic circumstances in Ghana and the neighboring country. Both 2019 and 2020 had similar high referral rates for investigation (77.52% and 75.52%

respectively) but lower than that of Prah et al.,¹⁹ who reported 84%. It was, however, higher than the figure quoted by Adorka et al.,²⁰ whose report stated that 17% were always sent for microscopic identification before prescribing antibiotics and 32% of samples were always sent for culture sensitivity tests. These differences could be explained by the fact that Prah's study was on the use of rapid diagnostic testing which could be done by doctors, nurses and other prescribers alike resulting in a higher figure. Even so, only 9% reported complete reliance on the results. This was significantly different from that of the results of this study which showed prevalence rates that emanated from different diagnostic forms. For a example, this most likely restricted medical consultation to trained prescribers whose propensity to request for investigations can be said to be evidence-based. The results were further limited by the fact that only 4 hospitals in Ghana, as well as 100 prescribers were selected for the study in Prah's publication and therefore it raised an issue of generalizability.

Conclusion

In conclusion, the study found the prevalence of febrile illnesses in children under 5 before COVID-19 pandemic was high in 2019 and markedly low in 2020; and this can be attributable to the pandemic which reduced attendance in health facilities for febrile illnesses globally. However, both 2019 and 2020 exhibited a high rate of referral for diagnostic investigations prior to final diagnosis and subsequent treatment, a clear demonstration of commitment to evidence-based medicine.

Conflict of Interest

The authors declare that they have no competing interest.

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