

ORIGINAL ARTICLE

Dengue and chikungunya infections in children

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ABSTRACT:

Background: In tropical nations, viral infections spread by Aedes mosquitoes continue to pose a serious threat to public health. Dengue is a global endemo-epidemic illness. The present study was performed to evaluate dengue and chikungunya infections in children. **Materials & Methods:** 85 children age ranged 10-16 years of both genders were selected. Five milliliters of blood were drawn in total to assess the biochemical and hematimetric variables. Rapid diagnostic methods based on immunochromatography were used to detect IgM/IgG antibodies and the NS1 antigen in dengue. Viral RNA from DENV, CHIKV, and ZIKV was found molecularly utilizing the reverse transcription-polymerase chain reaction (RT-PCR) technique. **Results:** Age group 10-12 years had 20, 12-14 had 43 and 14-16 years had 22 children. CHIKV was detected in 21, DENV in 40 and DENV- CHIKV in 24 cases. The difference was significant ($P < 0.05$). Common symptoms seen in CHIKV, DENV and DENV- CHIKV patients were headache in 87%, 90% and 55%, nausea in 74%, 62% and 43%, oedema in 69%, 76% and 37%, abdominal tenderness in 72%, 82% and 42% and myalgia in 24%, 75% and 64%, cough in 80%, 62% and 61%, diarrhea in 54%, 67% and 54%, rash in 90%, 82% and 67% respectively. A non-significant difference was observed ($P > 0.05$). **Conclusion:** Dengue virus infection was the most common infection among kids, followed by chikungunya virus infection. Most cases were observed in the 12–14 age range.

Key words: Children, chikungunya, dengue

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INTRODUCTION

In tropical nations, viral infections spread by Aedes mosquitoes continue to pose a serious threat to public health. Dengue is a global endemo-epidemic illness.¹ The chikungunya virus (CHIKV) has long been known to exist in Asia and Africa. More than 2 million cases of the virus have been documented in the continent of America since its discovery in 2013.^{2,3} While dengue virus (DENV) belongs to the Flavivirus genus and chikV to the alphavirus genus of the Togaviridae family, both cause comparable fever syndromes and share many signs and symptoms, particularly in children, which can result in misdiagnosis. Patients have reported rash, back discomfort, severe myalgias that could progress to severe joint pain, arthralgia/arthritis, and a fever that is greater than that of a DENV infection.⁴

Most likely, a number of arboviruses are significant and becoming more well-known, as evidenced by a rise in the number of cases reported and the spread of diseases like dengue.⁵ Furthermore, it's possible that malaria has received too many diagnoses in many regions of the world. The majority of arbovirus infections do not cause any symptoms, but they can

also have a wide range of effects, from a vague flu-like illness to serious consequences.^{6,7} The present study was performed to evaluate dengue and chikungunya infections in children.

MATERIALS & METHODS

The present study comprised of 85 children age ranged 10-16 years of both genders. All parents gave their written consent for the study.

Demographic profile of each subject was recorded. Five milliliters of blood were drawn in total to assess the biochemical and hematimetric variables. Rapid diagnostic methods based on immunochromatography were used to detect IgM/IgG antibodies and the NS1 antigen in dengue. The UMELISA Dengue IgM Plus was used to measure IgM levels for dengue, and the Capture IgG Elisa kit was used to identify high-affinity IgG antibodies against the virus. Viral RNA from DENV, CHIKV, and ZIKV was found molecularly utilizing the reverse transcription-polymerase chain reaction (RT-PCR) technique. Results were studied statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Age group (Years)	Number	P value
10-12	20	0.09
12-14	43	

14-16	22	
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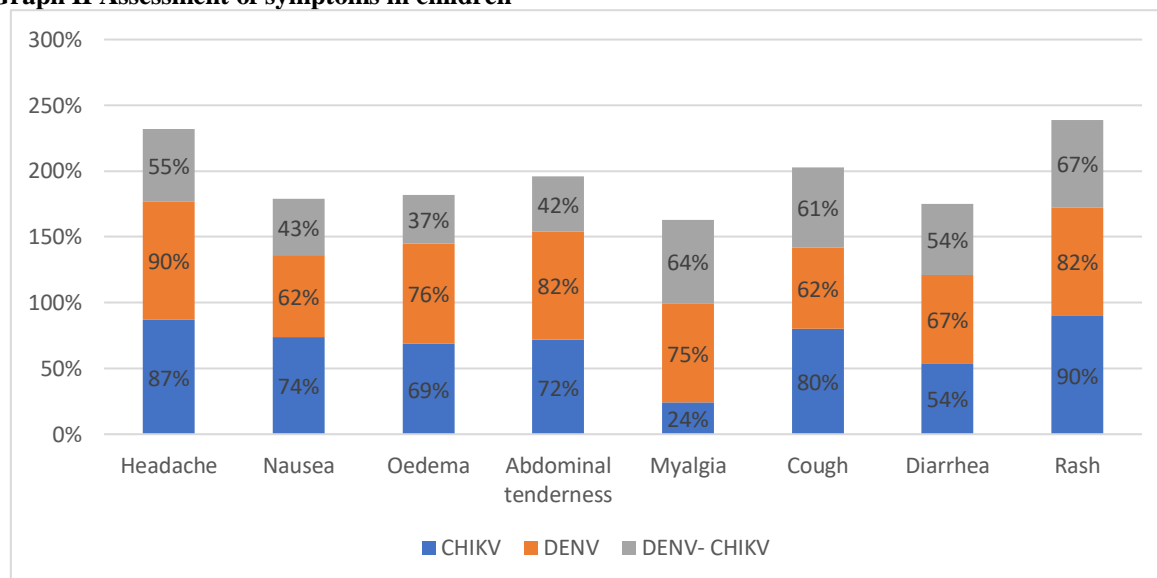
Table I shows that age group 10-12 years had 20, 12-14 had 43 and 14-16 years had 22 children. The difference was non-significant ($P > 0.05$).

Table II Type of viral infection

Viral infection	Number	P value
CHIKV	21	0.05
DENV	40	
DENV- CHIKV	24	

Table II shows that CHIKV was detected in 21, DENV in 40 and DENV- CHIKV in 24 cases. The difference was significant ($P < 0.05$).

Graph II Assessment of symptoms in children



Graph I show that common symptoms seen in CHIKV, DENV and DENV- CHIKV patients were headache in 87%, 90% and 55%, nausea in 74%, 62% and 43%, oedema in 69%, 76% and 37%, abdominal tenderness in 72%, 82% and 42% and myalgia in 24%, 75% and 64%, cough in 80%, 62% and 61%, diarrhea in 54%, 67% and 54%, rash in 90%, 82% and 67% respectively. A non-significant difference was observed ($P > 0.05$).

DISCUSSION

Due to their ongoing spread and escalating epidemic activities throughout the majority of the world's tropical and subtropical regions, dengue and chikungunya pose serious health risks to people worldwide.⁸ Dengue fever outbreaks have been documented on a regular basis for several decades in most tropical and sub-tropical regions of the world, while chikungunya outbreaks have spread globally in the last ten years.^{9,10} However, large-scale dengue and chikungunya fever epidemics have only recently emerged as a phenomenon in Africa.¹¹ The present study was performed to evaluate dengue and chikungunya infections in children.

We found that age group 10-12 years had 20, 12-14 had 43 and 14-16 years had 22 children. CHIKV was detected in 21, DENV in 40 and DENV- CHIKV in 24 cases. Awando et al¹² assessed the level of exposure and to possibly identify the epidemiologic and clinical factors of seropositive participants. They administered a questionnaire and used indirect elisa to test for the presence of denv-2 antibodies in febrile outpatients (n=422). The prevalence of denv-2 serocomplex

antibodies was 8.5% by indirect elisa and 1.2% by prnt. Using bivariable analysis, age ($p < 0.0001$), headache (or, 3.4 (1.6-7.4); $p = 0.002$), retro-orbital pain (or, 3.1 (1.2-7.7); $p = 0.015$), muscle ache (or, 2.6 (1.3-5.2); $p = 0.007$), jointpain (or, 3.5 (1.7-7.3); $p = 0.001$) and abdominal pain (or, 9.5 (2.44-37.24); $p = 0.001$) were significantly associated with denv-2 seropositivity. This study confirms that there is an existence of dengue virus 2 circulating in regions. Age, headache, retro-orbitalpain, muscle ache, joint pain and abdominal pain were associated with increased denv-2 seropositivity.

We observed that common symptoms seen in CHIKV, DENV and DENV- CHIKV patients were headache in 87%, 90% and 55%, nausea in 74%, 62% and 43%, oedema in 69%, 76% and 37%, abdominal tenderness in 72%, 82% and 42% and myalgia in 24%, 75% and 64%, cough in 80%, 62% and 61%, diarrhea in 54%, 67% and 54%, rash in 90%, 82% and 67% respectively. Van et al¹³ in their study potential risk factors for dengue infection were measured by questionnaire and IgM antibodies against dengue were detected by an enzyme-linked immunosorbent assay.

The role of landscape as a risk factor was studied using land cover maps and a geographic information system. Logistic regression identified risk factors for dengue seropositivity. Spatial patterns of seropositive cases were determined by cluster analyses. Six percent of the study population was seropositive. Risk factors for dengue seropositivity differed per site, demonstrating variation in local infection patterns. In the periurban site, seropositivity depended on human behavior and factors related to housing quality rather than environmental factors. In both rural sites, older persons had a higher risk of seropositivity and persons living in houses surrounded by natural and agricultural land covers had a lower risk of seropositivity.

CONCLUSION

According to the study's findings, dengue virus infection was the most common infection among kids, followed by chikungunya virus infection. Most cases were observed in the 12–14 age range.

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