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ORAL MANIFESTATIONS OF CHIKUNGUNYA FEVER IN CLINICALLY DIAGNOSED CHIKUNGUNYA CASES(CDCG)-A PURPOSIVE STUDY

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ABSTRACT

Aim and objective: The present study was undertaken to study the oral manifestations in clinically diagnosed Chikungunya cases which has recent epidemic breakdown in India after 43 years. **Methods:** This study was conducted in patients consulted for/ admitted in Government and private hospitals in epidemic regions of Chitoor and Nellore districts of Andhra Pradesh, India for clinically diagnosed Chikungunya from January 2010 to March 2010. A total of 200 persons having the signs and symptoms of clinically diagnosed Chikungunya were examined. Those with the history of systemic illness in the past two years were eliminated and thus a final sample of 112 patients was taken for this study. Blood samples were drawn and sent to National Institute of Virology, Pune for the serological confirmation of the Chikungunya fever after following the set protocols. Serum analysis was not done on two patients due to insufficient sera so the statistical analysis was done for 110 patients only. **Results:** The results showed that clinically oral manifestations were present in 95% of the patients. Females seem to be more affected than males. A significant difference is observed in the different age groups for symptoms. In clinically diagnosed Chikungunya patients higher age group (> 50 years) were found with higher rate of severity and symptoms than lower age group (< 20 years). **Conclusion**: The oral signs and symptoms in affected patients is clinically significant as opposed to previous studies which were conducted during previous epidemics. The authors propose to introduce the new term **"Gunya stomatitis"** to this oral signs and symptoms observed in this patients

KEY WORDS : **Chikungunya, oral signs and symptoms, Gunya stomatitis**.

INTRODUCTION

Chikungunya is a rare form of viral fever caused by a single stranded RNA virus of the genus *Alpha virus* in the family *Togaviridae* and transmitted to human by the bite of *Aedes aegypti* mosquito.[1] The name 'Chikungunya' is derived from the Makonde word meanings "that which bends up" in reference to the stooped posture which develops as a result of arthritic symptoms of the disease.[2] Chikungunya virus is of African origin and is maintained among non-human primates on that continent by *Aedes* mosquito of subgenera *stegomyia*. Disease is endemic in rural area of Africa.[2]

The disease was first described by Marion Robinson and W.H.R. Lumsden in 1955, following an outbreak on the Makonde Plateau, along the border between Tanganyika and Mozambique in 1952.[3] Chikungunya virus is not a stranger agent for India. It had caused two major outbreaks, one in Calcutta in 1963 and another in Madras and Vellore cities of Chennai state in 1964. Both the epidemics were short lived.[4] In India there is resurgence of the disease after 40 years[2,5]. In India a Chikungunya fever outbreak started in December 2005 when the country experienced more than 13 lakhs of Chikungunya infected patients.[6,7] There are no definite clinical signs and symptoms of this viral fever. The fever is clinically diagnosed by certain criteria set by World Health Organisation.[8](Table1)

Objective: Many studies were conducted during epidemics about the systemic involvement of clinically diagnosed patients of Chikungunya (CDCG).[9-13] Most of them concentrated on the symptoms like fever[9,10], arthralgia[9,10], retinal involvement[11], neurological involvement[12], mucocutaneous rashes[13] etc.. Review of the literature shows very scanty data is available on the oral manifestations of Chikungunya. A case of Chikungunya associated with candida has been reported.[14] Many of the clinically diagnosed Chikungunya (CDCG) patients suffer with several oral signs and symptoms.[9,10]

The objective of the present study is to set criteria to make the diagnosis of "**Gunya stomatitis"** which is a new term to be proposed based on certain oral manifestations in CDCG patients.

Table.1 Criteria for diagnosis of Chikunguniya[8]

Clinical criteria	Acute onset of fever > 38.5°C and severe Arthralgia/arthritis not explained by other medical conditions
Epidemiological criteria	Residing or having visited epidemic areas, having reported transmission within 15 days prior to the onset of symptoms
Laboratory criteria	At least one of the following tests in the acute phase: 1. Virus isolation; 2. Presence of viral RNA by RT-PCR 3. Presence of virus specific IgM antibodies in single serum sample collected in acute or convalescent Stage. 4. Four-fold rising of IgG titers in samples collected at least three weeks apart
Case definition for surveillance	**Possible case:** a patient meeting clinical criteria **Probable case:** a patient meeting both the clinical and epidemiological criteria **Confirmed case:** a patient meeting the laboratory criteria, irrespective of the clinical presentation

Material and Methods

Information about the epidemics of the Chikungunya in the Districts of Nellore and Chittoor of Andhra pradesh was obtained from the concerned Government officials and blood samples were collected from those suspected to suffering from the clinically diagnosed Chikungunya patients.[8] Suspected patients of Chikungunya were identified based on the clinical symptoms guidelines provided by the NICD [15]. A total of 200 patients were selected for screening the oral manifestations. A pre-tested questionnaire developed by authors was used for the survey. Purposive sampling method was adopted targeting clinically diagnosable Chikungunya patients. Whenever such a case was found, the questionnaire having information about their personal data such as name, age, sex, location and date of onset of illness, medical history and general/systemic examination features were filled up. Along with case history taking, general and systemic examination were carried out to clinical confirm the diagnosis of the Chikungunya. Exclusion criteria included any systemic disease in the last two years, and drug history of taking the medicines for more than six months. Out of the 200 patients 88 patients were eliminated following the exclusion criteria as described above. A total of 112 patients were selected after elimination. After explaining the purpose and after obtaining informed consent, blood (8-10 ml) was withdrawn from each of the 112 patients. These patients were examined for oral manifestations before sending the blood samples for serological analysis. Serum was separated by centrifuge and the samples were sent to National Institute of Virology (NIV), Pune for detection of CHIK virus IgM antibodies by ELISA method.[10]

The following oral signs and symptoms were evaluated in CDCG patients, Mucopyrosis (burning sensation to mouth), Dysphagia/ pain on swallowing, Distaste, ulcerations, Erythema (mucositis), Trismus (restricted mouth opening or pre-auricular pain even on slight opening), Gingivitis, lymphadenopathy and Non specific conditions. The following criteria (Table-2) are set for each of this signs and symptoms. A questionnaire and clinical examinations were carried out on these patients. The examination is carried out by single examiner who is a qualified dental surgeon.

Results: sera samples for two patients out of 112 patients cannot be processed due to insufficient quantity. The data collected during the study was tabulated and analysed for the remaining 110 patients**.** Data analysis was done using the statistical package GRAPHPAD to derive the values of probability, (P value) Chi-square (x^2) at one degree of freedom.

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Discussion.

Oral cavity is the gateway to the systemic health and condition of a person. The present study is reflection of the above statement. In the present study, in almost all the CDCG patients there is definite involvement of the oral mucosa in one form or the other(Table 3 and Table 4). Oral manifestations were present in 95.46% of the CDCG patients. Out

of the 110 patients that were serologically analyzed 37 patients (33.63%) were tested positive. Five patients were without any oral manifestations. Incidentally these five patients tested serologically negative. The data was analyzed according to the age groups and gender wise. There seems to be a slight predilection for females. Out of the 110 CDCG patients females (63) has a slight predilection over

Table.2. Criteria for oral manifestations of Chikunguniya

Mucopyrosis	The burning sensation of whole or any part of the mouth 1-2 days before or after the onset of clinical symptoms of CDCG.
Erythema (Fig.1)	Any change in colour of any part of oral mucosa diet-1-2 days before or after the onset of clinical symptoms of CDCG.
Ulcerations	Single or multiple ulcerations at different site/sites of oral cavity 1-2 days before or after the onset of clinical symptoms of CDCG. The place of anatomical occurrence is noted in correlation to erythema.
Dysphagia	Any difficulty in swallowing the normal consistent diet that is being taken daily
Distaste	Sudden dislike for the intake of normal diet 1-2 days before or after the onset of clinical symptoms of CDCG.
Trismus (Fig.2)	Pre-auricular pain on normal mouth opening or restricted mouth opening of less than 20mm. of interincisal distance.
Gingivitis	Any change in colour, texture, consistency or bleeding of gums that is coincident with 1-2 days before or after the onset of clinical symptoms of CDCG
Lymphadenopathy	Swelling and tenderness of sublingual and submandibular lymphnodes
Other symptom	Any other sign and symptom that is not explained above and is clinically observed or that is obtained from patients' questionnaire.

males (57). The same trend is reflected in serological diagnosis with 19 patients of females testing positive as against 18 male patients. This is in accordance with study conducted in kerala[9] but in contradiction to the findings of the earlier study conducted in Maharasthra.[10] There is tendency for oral mucosal lesions to increase with the age. The burning mouth as expressed in patient's words is the common symptom in almost all the sero-positive patients . Most of the patients were not able to recollect whether it is prodromal symptom associated with fever or not. The second most common sign and symptom is erythema (average of 95%) or change in the colour of the mouth and tongue (as in patient's words) before the burning sensation. The lips, tongue,floor of the mouth, palate were involved in the order. Wide spread ulcers were also noted in the oral cavity in 75 -90% of the patients. In earlier studies oral ulcers are reported in 63% of patients.[9] No part of the oral cavity seems to be immune to oral ulcers. Oral ulcers slightly bigger than apthous ulcers were noted. Multiple ulcers were noted in most of the patients and solitary ulcer is not noted in any single case. The ulcers on the soft palate are common followed by hard palate, tongue and floor of the mucosa. The labial mucosa and buccal mucosa were beefy red in colour with or without ulcers. The palatal erythema was invariable associated with the multiple ulcers. This may be the cause of dysphagia noted in these patients. The dysphagia noted in individual age groups (57-75%) is statistically significant. In the younger age group (< 20 years) TMJ arthralgia is associated with all the seropositive patients. In earlier studies of CDCG patients arthralgia was polyarticular [9,10,16] associated with pain and 35 patients (39.7%) had test results positive for IgM antibodies to chikungunya virus[16]. The joints in the extremities were commonly involved in earlier studies. But in our study the involvement of TMJ which is non weight bearing joint is noted. The TMJ arthralagia is clinically significant in our study in seropositive patients. This needs to be reevaluated in the light of immunology as all the patients in the younger age group were tested seropositive. The interdental gingiva is commonly involved in majority of patients with bulbous swelling. Bleeding of the gingiva is also reported in the younger age groups. The other non specific findings included the peeling of interdental mucosa, operculitis, pericoronitis which may be coincident with the onset of viral infection which are not statistically significant.

CONCLUSION

The appearance of oral lesions in Chikungunya is similar to other viral infections in many aspects such as erythema, ulcerations and burning sensation of the mucosa. The presence of the signs and symptoms of TMJ arthralgia, dysphagia and ulcerations is statistically significant in sero positive cases. Hence we propose to introduce the term '**Gunya stomatitis'** that involves the signs and symptoms of TMJ involvement associated with

generalized mucosal erythema and ulcers of the oral cavity with accompanying dysphagia. The limitations for the present study is that it is a retrospective study and a prospective and study has to be conducted targeting the patients with suspected chuken guniya which is prevalent only during epidemics. The drawback of the present study is that we were not able to assess the cause of oral lesions whether it is due to virus-Host interaction or a part of drug therapy. The cause for non sero conversion of the majority of the clinically diagnosed patients has to be crtically examined in view of the viral structure and immunology. Another limitation is that we were not able to assess whether oral manifestations are prodromal symptoms or a part of systemic involvement of the viral fever. If the oral manifestations are prodromal symptoms proper precaution and care can be taken to prevent the Chikungunya from crippling the patient due to its systemic involvement.

Table3. Comparison of oral manifestations among various groups in clinically diagnosed Chikungunya patients (n=110)

Oral manifestations -Signs and symptoms	Percentage of Signs and symptoms			
	Age in years			
	1-20 (n=16) 14.54%	21-35 (n=22) 20%	36-50 (n=30) 27.27% .	>50 (n=42) 38.18%
Oral manifestations absent	6.25	4.54	3.33	2.38
Mucopyrosis(burning sensation of mouth)	93.25	95.46	96.330	97.62
Erythema(mucositis)	87.50	90.9	93.33	95.23
ulcerations	62.50	72.7	76.66	71.40
Dysphagia/ pain on swallowing	12.00	22.7	36.66	83.33
Distaste	31.25	31.8	73.33	85.75
Trismus (restricted mouth opening or preauricular pain even on slight opening)	81.25	63.6	53.30	47.60
Gingivitis	75.00	81.82	83.33	71.42
Lymphadenopathy	93.25	81.82	73.33	71.42
Non specific	12.5	9.99	6.66	4.76

Table.4 Comparison of oral manifestations among various groups in serologically diagnosed Chikungunya patients(n=37)

Oral manifestations -Signs and symptoms	Percentage of Signs and symptoms			
	Age in years			
	1-20 (n=4)	21-35 (n=7)	36-50 (n=10)	>50 (n=16)
Mucopyrosis(burning sensation to mouth)	100.00	100.00	100.00	100.00
Erythema(mucositis)	100.00*	85.71	90.00	93.75
ulcerations	75.00*	85.71*	90.00*	87.5*
Dysphagia/ pain on swallowing	75.00*	57.14*	70.00*	75.00**
Distaste	75.00*	57.14*	70.00	75.00**
Trismus (restricted mouth opening or preauricular pain even on slight opening)	100.00*	85.71*	70.00**	88.88*
Gingivitis	75.00	71.42**	80.00	75.00
Lymadenopathy	100.00	85.71	80.00	75.00
Non specific	5.00	14.28	10.00	6.25

Chi-square values at 1 degree of freedom * P< 0.0001-statistically extremely significant: ** P<0.001- statistically significant: Other values not statistically significant.

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Fig.1 Erythema involving the lower lips

Fig.2.Restricted mouth opening

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