

*Original Research Paper***Cutaneous Manifestations of Chikungunya Fever:  
An outbreak in North India****Chopra D\* Goel S\*\* Bansal S\*\*\* Arora N\*\*\* Singla A\*\*\***

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**Abstract:** Chikungunya (CKG) is acute viral arboviral disease transmitted by the bite of aedes aegypti and aedes albopictus mosquito. Recently, CKG is emerged in north India affecting large population. CKG is characterized by high grade fever, retro-orbital pain and severe joint pains. During current epidemic various mucocutaneous manifestations have been seen among patients. Pigmentation was the most common cutaneous manifestation followed by maculopapular rash. Other features include aphthous ulcer, urticarial wheals, petechiae and psoriasis vulgaris. These mucocutaneous features may help in differentiating various acute viral exanthems.

**Key Words:** chikungunya, mucocutaneous, pigmentation

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**Introduction**

Chikungunya fever is caused by an arbovirus transmitted by the bite of aedes aegypti and aedes albopictus mosquito.<sup>1</sup> It is characterised by acute febrile illness with moderate to severe joint pains. Other associated features include myalgia, headache, photophobia, retro-orbital pain and mucocutaneous lesions like erythematous maculopapular rash, pruritis and pigmentation.

Chikungunya was first reported from Tanzania in 1953. After that the epidemic of Chikungunya fever occurs cyclically over years or decades. It was first reported in India from Calcutta in 1963 followed by its epidemic in Tamil Nadu, Andhra Pradesh and Maharashtra in 1964-65.<sup>2</sup> In 1973 an outbreak was again reported from Sholapur district in Maharashtra. After that the CKG virus seemed to have disappeared from India. After a quiescence of 32 years, CKG epidemic re-emerged in some of the islands of Indian ocean – La Reunion, Seychelles and Mauritius in Feb 2005.<sup>2</sup> Simultaneously in Dec 2005, there was an explosive outbreak of CKG in South India affecting 13 states. Outbreaks occurred in Kerala in May 2006, 2007 and 2009.<sup>3,4</sup> An outbreak occurred in Tamil Nadu and Maharashtra in 2009-10.<sup>5</sup> In 2011 cases of CKG were reported from all over India except 3 states- Punjab, Lakshadweep and Dadra

and Nagar Haveli. We hereby, are reporting cutaneous manifestations of Chikungunya fever in Patiala, Punjab which is being reported for the first time from North India.

**Methods**

Patients attending the OPD of Department of Dermatology of a tertiary care hospital in Patiala with cutaneous manifestations of CKG during October-November, 2016 were included in the study. It was an observational study. Diagnosis of CKG was made clinically by the presence of fever with joint pains and other constitutional symptoms. It was confirmed by serology which was done in the Microbiology Department of the hospital. All other causes of acute febrile illness like Dengue, Malaria and Typhoid were ruled out.

**Results**

A total of 22 patients with cutaneous manifestations of Chikungunya were reported. The males (13) outnumbered the females (9). Mean age of the patient was 37 years. In these cases, clinical features other than fever included joint pains (100% cases), headache (77.27% cases), myalgia (81.81% cases) and vomiting (54.54% cases). Most common cutaneous manifestation was pigmentation that was present in 18 patients. Most common site of pigmentation was nose and most common pattern was freckle like. Erythematous maculopapular rash was seen

in 16 patients. Aphthae like ulcers in axilla and groin was seen in three patients. Urticarial wheals were seen in one case. Petechial lesions over shins were observed in three patients. One patient presented with lesions of new onset psoriasis vulgaris. Cutaneous manifestations mostly developed in the first week of illness. These were preceded by fever. Mucosal lesions and nail involvement were not seen in our study.

## Discussion

Chikungunya is an acute febrile illness with severe arthritis, constitutional symptoms and mucocutaneous manifestations.<sup>6</sup> It has re-emerged in India after a long quiescent period. The cause for its resurgence is not very clear. It may be due to increasing globalisation, multiplication and poor control of aedes mosquito, absent herd immunity and mutation of the CKGV.<sup>7</sup>

CKG can be seen in all age groups and both sexes. All of our patients were adults. There is a male preponderance in our study (13 males and 9 females) that has also been seen in most other studies.<sup>7,8</sup> One study reported equal sex ratio.<sup>9</sup> Vertical transmission from mother to fetus has been reported in an outbreak at La Reunion Island.<sup>6</sup> It was not observed in our study.

The most common manifestation in our study was pigmentation which was observed in 18 patients. It was the most common manifestation in study done by Inamadar et al<sup>8</sup> and second most common manifestation in study done by Riyaz et al.<sup>4</sup> Nose was the commonest site of pigmentation, same as in other studies<sup>10,11</sup> and macular freckle like pigmentation was the most common pattern observed. Other patterns observed were melasma like, diffuse and irregular pigmentation of face and flagellate pattern on trunk. Aggravation of pre-existing melasma was seen in two patients. Pigmentation developed on fourth- sixth day of illness in most cases. In study done by Riyaz et al<sup>4</sup> pigmentation developed two weeks after the rash. Mechanism of pigmentation may be the increased dispersion of melanin in the epidermis triggered by the virus.<sup>8</sup>

Erythematous maculopapular rash on trunk, extremities and face has been described as the most common cutaneous feature in CKG.<sup>2,7</sup> It was observed in 16 of our cases and was the second most common manifestation in our study. It was generalised in distribution involving trunk, extremities and face. It developed on second-

third day of illness in most of the cases and subsided within a week. Recurrent crops of the lesions occurred in four patients. It was accompanied by edema of hand and feet in 13 patients and desquamations of palms and soles in five patients. Morbilliform rash of upper limb was the most common cutaneous manifestation in study done by Bandyopadhyay et al.<sup>9</sup>

Aphthae- like ulcers in axilla and groin has also been seen in CKG fever.<sup>3,7,8,9</sup> It was seen in four male patients and was the third most common manifestation in our study. It developed in the second week. Ulcers were 1 - 1.5 cm in size, irregular in shape, discrete to confluent and were associated with pain. Smear for gram stain from the ulcer base was negative and culture revealed no growth.

Petechiae was observed on the shins in three patients. It has also been reported in the studies by Kannal et al<sup>3</sup> and Riyaz et al.<sup>4</sup> Urticarial wheals were reported in one patient. Aggravation of the pre- existing dermatosis like Psoriasis, Pemphigus, Lichen planus and precipitation of type 1 reaction in Leprosy has been documented in CKG.<sup>4,8</sup> though such cases were not seen in our study. One patient presented to us with new onset Psoriasis vulgaris on the 10<sup>th</sup> day after the onset of CKG fever which has never been reported in earlier studies.

Other cutaneous features of CKG like ecchymotic lesions and subungual haemorrhages has been described in Inamadar's series.<sup>8</sup> In paediatric cases vesicobullous lesions has been described in an outbreak at La Reunion islands<sup>12</sup> and various other studies.<sup>4,7</sup> Paediatric cases were not seen in our study. TEN like cutaneous erosions and EM like lesions has been described in study by Riyaz et al.<sup>4</sup>

Most of the cutaneous manifestations developed in the first week of illness in our study which is similar to the study done by Hochedez et al.<sup>1</sup> They reported 77% of cutaneous manifestations in first week which predominantly involved trunk and extremities, sparing the face. Facial involvement was seen in all of our patients. Patients complained of residual joint pain and stiffness. Most of the cutaneous manifestations subsided without any sequelae except pigmentation that took two-three months to resolve.

Serology ( IgM CKG ) was positive in 95.94% ( 21 cases). It was negative in one patient.

It may be because the blood samples were sent very early, before the appearance of antibodies. In CKG protective antibodies appear after three to five days of illness.<sup>9</sup> It was positive in 97% cases in study by Riyaz et al<sup>4</sup> and 40.13 % cases in study by bandyopadhyay et al.<sup>9</sup>

Pathogenesis of the cutaneous lesions induced by CKGV is not very clear. Initial manifestations in any viral disease is because of the viremia and dissemination of virus to various organs. Erythematous rash and vasculitic lesions may be because of the vasodilation and vascular endothelial damage caused by the virus. Vesicular lesions may be caused by the virus induced epidermal cell necrosis and ballooning degeneration.<sup>13</sup> It may also be responsible for apthae like ulcers in axilla and groin.

### Conclusion:

An epidemic of CKG had recently emerged in North India with varied cutaneous manifestations. The striking pigmentation of the nose and apthae- like ulcers in flexures were some of the interesting features observed and new onset Psoriasis vulgaris was seen in one patient which has not been reported in the previous studies, mostly from South India. CKG fever mimics other viral illness like dengue. Serology is the only reliable method to distinguish the two diseases. We are reporting the cases as the CKG epidemic recently occurred in North India with its peculiar cutaneous manifestations. There has been no previous case report on cutaneous manifestations of CKG fever from North India.

### Limitations:

There may be underreporting of the cases of CKG to skin opd. Biopsy and histopathological correlation was not done in our study.

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Chick SignL Freckle like pigmentation present over face and perinasal area



Aphthae like ulcers present over axilla

## Table

Table 1: Myriad spectrum of cutaneous manifestations of chikungunya

S.No	Age/Sex	H/O Fever and Joint pain	Cutaneous manifestations			Type of pigmentation	Serology (IgM CKG)
			Day 2-4	Day 4-6	Day 6-10		
1	48yr/M	present	Maculopapular rash	Pigmentation on nose	Apthae like ulcers in axilla and groin	Macular freckle like	Positive
2	35yr/F	present	Maculopapular rash	Pigmentation on nose and perineal region		Freckle like	Negative
3	20yr/M	present	Maculopapular rash	pigmentation on nose		Freckle like	Positive
4	36yr/F	present	Maculopapular rash				Positive
5	32yr/M	present	Maculopapular rash, Pigmentation on cheeks and preauricular region			Freckle like	Positive
6	62yr/M	present	Maculopapular rash		Apthae-like ulcers in axilla and groin		Positive
7	38yr/M	present	Petechiae on shins	Pigmentation in preauricular region		Melasma like	Positive
8	42yr/F	present	Maculopapular rash	Pigmentation on trunk		Flagellate pattern	Positive
9	40yr/M	present	Pigmentation on nose	Petechiae on shins		Freckle like	Positive
10	42yr/M	present	Maculopapular rash	Pigmentation on nose	Apthae like ulcers in axilla and groin	Freckle like	Positive
11	36yr/M	present	Maculopapular rash	Pigmentation on nose and central part of face		Freckle like	Positive
12	39yr/F	present	Petechiae on shins	Pigmentation on cheeks and preauricular region		Melasma like	Positive
13	29yr/M	present	Maculopapular rash	Pigmentation on nose		Freckle like	Positive
14	47yr/M	present	Maculopapular rash	Pigmentation on nose	Apthae like ulcers in axilla and groin	Freckle like	Positive
15	32yr/M	present	Maculopapular rash				Positive
16	29yr/F	present	Maculopapular rash	Pigmentation on nose		Freckle like	Positive
17	42yr/M	present		Diffuse pigmentation of face		diffuse	Positive
18	25yr/F	present	Maculopapular rash	Aggravation of pre-existing melasma			Positive
19	36yr/F	present	Maculopapular rash	Pigmentation on nose and central part of face		Freckle like	Positive
20	42yr/M	present	Urticarial wheals	Pigmentation on nose		Freckle like	Positive
21	30yr/F	present	Maculopapular rash	Aggravation of pre-existing melasma			Positive
22	35yr/F	present			New onset psoriasis vulgaris		Positive