

Guidelines on Clinical Management of Chikungunya Fever



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Guidelines on Clinical Management of Chikungunya Fever

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Foreword



Chikungunya is an emerging vector-borne disease of high public health significance in WHO's South-East Asia Region. It has been reported from countries of South and East Africa, South Asia, South-East Asia and, in 2007, from Italy. In the South-East Asia Region, outbreaks have been reported from India, Indonesia, Maldives, Myanmar, Sri Lanka and Thailand. There have been

massive outbreaks of chikungunya fever in recent years in India, and also in the island countries of the Indian Ocean. Maldives reported outbreaks of Chikungunya fever for the first time in December 2006. Although not a killer disease, high morbidity rates and prolonged polyarthrititis lead to considerable disability in a proportion of the affected population and can cause substantial socioeconomic impact in affected countries.

The socioeconomic factors and public health inadequacies that facilitated the rapid spread of this infection continue to exist. As it is a new and emerging disease it has not received sufficient coverage yet in the medical curricula of Member States. Specific treatment is not available, and there is no vaccine for the prevention of chikungunya fever. It has therefore become imperative to develop guidelines, based on the limited clinical experience gathered from managing patients so far, for appropriate management of patients in communities and in health facilities. Experts engaged in managing patients with chikungunya fever in the Region were brought together by the WHO Regional Office for South-East Asia to outline guidelines for managing various situations and stages of the disease. This publication is the end result of that exercise and is intended to assist health-care providers in planning and implementing appropriate care to patients with chikungunya fever according to their actual clinical conditions.

I hope that these guidelines will be helpful to Member countries in the area of case management of patients suffering from this re-emerging disease.

A handwritten signature in black ink that reads "Samlee Plianbangchang".

Samlee Plianbangchang, M.D., Dr.P.H.
Regional Director

Acknowledgement

This guide was initially drafted by Dr. R. Sajith Kumar, MD, Ph. D, specialist in Infectious Diseases, Kottayam, Kerala, India. The original draft was peer reviewed extensively by a consortium of clinicians in various disciplines and public health workers as listed below at the peer-review meeting held in 7-8 August 2008 in the South-East Asia Regional Office of WHO in New Delhi. Further consultation was also obtained from Dr Kee Tai GOH, Associate Professor and Sr. Consultant at the WHO Collaborating Centre for Environmental Epidemiology, Ministry of Health in Singapore before the preparation of the final draft.

Acknowledgment is made to all the contributors and to the many patients who suffered the disease and allowed us this new knowledge so we could use it to try to alleviate the suffering of future patients.

List of participants in the Peer-review meeting held in 7–8 August 2008

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1. Introduction

Chikungunya fever (CF) is a viral illness caused by an arbovirus transmitted by the *Aedes* mosquitoes. The disease was documented first time in the form of an outbreak in Tanzania. The name is derived from the 'makonde' dialect which means 'that which bends up', indicating the physical appearance of a patient with severe clinical features.

1.1 Causative agent

Chikungunya fever is caused by virus of same name (CHIK virus in short) which is an RNA virus that belongs to the *Alphavirus* genus of the *Togaviridae*, the family that comprises a number of viruses that are mostly transmitted by arthropods. The virus was first isolated in 1952-1953 from both man and mosquitoes during an epidemic of fever that was considered clinically indistinguishable from dengue fever in Tanzania.

It is a single stranded RNA virus, heat labile and sensitive to temperatures above 58° Celsius. Three lineages with distinct genotypic and antigenic characteristics have been identified: two phylogenetic-groups from Africa and one from Asia. Chikungunya virus strains isolated in India during the 2006 outbreak are closely related to strains isolated that year from Réunion islands.

1.2 Vector

Aedes aegypti is the common vector responsible for transmission in urban areas whereas *Aedes albopictus* has been implicated in rural areas. Recent studies indicate that the virus has mutated enabling it to be transmitted by *Aedes albopictus*. The *Aedes* mosquito breeds in domestic settings such as flower vases, water-storage containers, air coolers, etc. and peri-domestic areas such as construction sites, coconut shells, discarded household junk items (tyres, plastic and metal cans, etc.). The adult female mosquito rests in cool and shady areas in domestic and peri-domestic settings and bites during day time.

There is no significant sex predilection and the virus causes illness in almost all age groups.

As this is an illness not sufficiently covered in medical curriculum, it has become necessary to develop new guidelines, based on the limited clinical experience from managing patients in the region.

3. Clinical management

3.1 Presentation

CHIK virus causes a febrile illness in the majority of people with an incubation period of **2-4** days from the mosquito bite. Viremia persists for upto 5 days from the clinical onset. Commonest presenting features (Table 1) are:

- Fever (92%) usually associated with
- Arthralgia (87%),
- Backache (67%) and
- Headache (62%).

The fever varies from low grade to high grade, lasting for 24 to 48 hours. Fever rises abruptly in some, reaching 39-40°C, with shaking chills and rigor and usually subsides with use of antipyretics. No diurnal variation was observed for the fever.

In the recent outbreaks many patients presented with arthralgia without fever. The joint pain tends to be worse in the morning, relieved by mild exercise and exacerbated by aggressive movements. The pain may remit for 2-3 days and then reappear in a saddle back pattern. Migratory polyarthritis with effusions may be seen in around 70% cases (Fig 1), but resolves in the majority. Ankles, wrists and small joints of the hand were the worst affected. Larger joints like knee (Fig 1) and shoulder and spine were also involved. There is a tendency for early and more significant involvement of joints with some trauma or degeneration.

Occupations with predominant overuse of smaller joints predisposed those areas to be affected more. (eg. interphalangeal joints in rubber tappers, ankle joints in those standing and walking for a long time eg. policemen). The classical

Figure 1: *Joint manifestations in Chikungunya fever*



bending phenomenon was probably due to the lower limb and back involvement which forced the patient to stoop down and bend forward.

Other clinical features

Transient maculopapular rash is seen in up to 50 % patients. The maculopapular eruption persisted for more than 2 days in approx. 10% cases. Intertriginous aphthous-like ulcers and vesiculobullous eruptions were noticed in some. A few persons had angiomatous lesions and fewer had purpuras. Stomatitis was observed in 25% and oral ulcers in 15% of patients. Nasal blotchy erythema followed by photosensitive hyperpigmentation (20%) was observed more commonly in the recent epidemic. Exfoliative dermatitis affecting limbs and

Table 1: *Clinical features in Chikungunya fever*

Common	Infrequent	Rare in adults but seen sometimes in children
Fever	Rash	Photophobia
Arthralgia	Stomatitis	Retro-orbital pain
Backache	Oral ulcers	Vomiting
Headache	Hyperpigmentation	Diarrhoea
	Exfoliative dermatitis	Meningeal syndrome
		Acute encephalopathy

face was seen in around 5% cases. Epidermolysis bullosa was an observation in children. Most skin lesions recovered completely except in cases where the photosensitive hyperpigmentation persisted.

Photophobia and retro-orbital pain have been observed. Although rare in adults, children, particularly neonates have developed vomiting and/or diarrhoea and meningo-encephalitis. Neurologic manifestations such as encephalitis, febrile seizures, meningeal syndrome and acute encephalopathy were reported. Neuroretinitis and uveitis in one or both eyes have also been observed. The main ocular manifestation associated with the recent epidemic outbreak of chikungunya virus infection in South India included granulomatous and nongranulomatous anterior uveitis, optic neuritis, retrobulbar neuritis, and dendritic lesions. The visual prognosis generally was good, with most patients recovering good vision.

Sequelae

Persistent arthralgic forms had been described in 1980 in South Africa, where a retrospective study has shown complete resolution in 87.9 %; 3.7 % had episodic stiffness and pain , 2.8% had persistent stiffness without pain and 5.6% had persistent painful restriction of joint movements. Enthesopathy and tendinitis of tendoachilles was observed in upto 53% of those who had musculoskeletal involvement. Neurological, emotional and dermatologic sequelae are also described.

3.2 Laboratory diagnosis

The confirmation of Chikungunya fever is through any of the followings:

- Isolation of virus
- PCR
- Detection of IgM antibody
- Demonstration of rising titre of IgG antibody

IgM antibodies demonstrable by ELISA may appear within two weeks. It may not be advisable to do the antibody test in the first week. In some persons it may take six to twelve weeks for the IgM antibodies to appear in sufficient concentration to be picked up in ELISA

No significant pathognomonic hematological finding is seen. Leucopenia with lymphocyte predominance is the usual observation. Thrombocytopenia is rare. Erythrocyte sedimentation rate is usually elevated. C-Reactive Protein is increased during the acute phase and may remain elevated for a few weeks. A small proportion of patients have tested positive for rheumatoid factor during and after clinical episode.

3.3 Differential diagnosis

Fever with or without arthralgia is a very common manifestation of several other diseases. CHIK fever may not have the typical manifestations or it may co-exist with other infectious diseases like dengue fever or non infectious diseases like rheumatoid arthritis. Some of the diseases which can be considered in differential diagnosis are:

- (1) Leptospirosis Severe myalgia localized to calf muscles with conjunctival congestion/ or subconjunctival haemorrhage with or without oliguria or jaundice in a person with history of contact to contaminated water might suggest Leptospirosis.
- (2) Dengue fever Severe backpain with purpuras or active bleeding might suggest dengue fever. Confirmatory laboratory diagnosis is possible.
- (3) Malaria Periodicity of fever and alteration of consciousness / seizures should prompt a diagnosis for malaria.
- (4) Meningitis High fever with neck stiffness or alteration of consciousness should prompt a thought about meningitis. All cases of meningo-encephalitis during an outbreak of CF must be suspected to have CF.
- (5) Rheumatic fever is more common in the children and presents with fleeting (migratory) polyarthritis predominantly affecting the large joints. Modified Jones criteria should be the basis for diagnosis. Raised ASO titre and a history of recurrent sore throat are other points to be noted.

3.4 Guiding principles of clinical management

Clinical Management of CF is discussed at two stages

- (1) Acute stage of the illness and
- (2) Sequelae.

Guiding principles of clinical management

- There is no specific antiviral drug against CHIK virus
- Treatment is entirely symptomatic
- Paracetamol is the drug of choice with use of other analgesics if paracetamol does not provide relief
- During the acute stage of the disease, steroids are not usually indicated because of the adverse effects.
- Aspirin is preferably avoided for fear of gastrointestinal and other side effects like Reye's syndrome.
- Mild forms of exercise and physiotherapy are recommended in recovering persons.
- Treatment should be instituted in all suspect cases without waiting for serological or viral confirmation.
- During an epidemic, it is not imperative that all cases should be subjected for virologic/serologic investigations.
- All suspected cases should be kept under mosquito nets during the febrile period.
- Communities in the affected areas should be sensitized about the mosquito control measures to be adopted in hospital premises and houses.

Guiding principles for managing acute stage

Clinical Management of CF during acute stage can be elaborated at four levels

- Domiciliary (Home care)
- At the primary level or point of first contact (PHC/CHC level)
- At the secondary level (District Hospital)
- At the tertiary level (Teaching hospital situations / infectious diseases specialists/advanced care centres.)

Domiciliary (Home based)

All cases of fever cared in their own homes should be advised on the following.

- Adequate rest in a warm environment; avoid damp surroundings. Heat may increase/worsen joint pain and is therefore best to avoid during acute stage.
- Refrain from exertion. Mild forms of exercise and physiotherapy are recommended in recovering persons.
- Cold compresses may help in reducing joint damage
- Consume plenty of water with electrolytes (approximately 2 litres of home available fluids with salt in 24 hours). If possible ensure a measured urine output of more than a litre in 24 hours.
- Take paracetamol tablets during periods of fever (up to two 500 mg tablets four times daily), in persons with no preexisting liver or kidney disease
- Avoid self medication with aspirin or other pain killers.

When to seek medical help?

- Fever persisting for more than five days
- Intractable pain
- Postural dizziness, cold extremities
- Decreased urine output
- Any bleeding under the skin or through any orifice
- Incessant vomiting

At the point of first contact (PHC/CHC level)

All fever cases must be seen by a medical officer and differential diagnoses of dengue fever, leptospirosis, malaria and other illnesses excluded by history, clinical examination and basic laboratory investigations.

All persons should be assessed for dehydration and proper rehydration therapy (preferably oral) instituted quickly.

Severe dehydration is characterized by two of these signs:

- abnormal sensorium, excessive sleepiness or lethargy
- sunken eyes
- poor fluid intake
- dry, parched tongue
- reduced skin turgor (very slow skin pinch taking more than 2 sec to retract)

Mild or Moderate dehydration is characterized by two of these signs:

- restlessness or irritability
- sunken eyes
- dry tongue
- excessive thirst
- slow skin pinch (less than 2 seconds to retract)

Collect blood samples for total leucocyte count, platelet count. The total leucocyte count is usually on the lower side (below 5000 cells / cu. mm). If it is more than 10 000 per cu mm, the possibility of leptospirosis has to be considered. A low platelet count (below 50 000 per cu. mm) should alert the possibility of dengue fever. The peripheral smear has to be examined for malarial parasite as well and if positive, treatment started as per national guidelines.

Treat symptomatically (Paracetamol 1g three to four times a day for fever, headache and pain, antihistamines for itching). Paracetamol must be used with caution in persons with preexisting underlying serious illnesses. Children may be given 50-60 mg per kg body weight per day in divided doses. Tepid sponging can be suggested.

If the case has already been treated with paracetamol/ other analgesics, start one of the NSAIDS (as per standard recommendations). Monitor for any adverse side effects of NSAIDS. Cutaneous manifestations can be managed with topical or systemic drugs.

If the person has hemodynamic instability (frequent syncopal attacks, hypotension with a systolic BP less than 100 mmHg or a pulse pressure less

than 30 mmHg), oliguria (urine output less than 500 ml in 24 hours), altered sensorium or bleeding manifestations, refer immediately to a higher healthcare centre. Refer persons not responding or having persistent joint pain or disabling arthritis even after three days of symptomatic treatment. It may be advisable to refer persons above sixty years and infants (below one year of age) as well.

Heat may increase/worsen joint pain and is therefore best to avoid during acute stage. Mild forms of exercise and physiotherapy are recommended in recovering persons. Patients may be encouraged to walk, use their hands for eating, writing and regular isotonic exercises. Cold compresses may be suggested depending on the response. Exposure to warm environments (morning and evening sun) may be suggested as the acute phase subsides.

At the secondary level (district hospital)

All fever cases with joint or skin manifestations must be evaluated by a physician.

Assess for dehydration and institute proper rehydration therapy, preferably by oral route (as above)

Collect blood samples for serology (IgM – ELISA). As an alternative, blood test for IgG may be done — to be followed by a second sample after two to four weeks.

Investigate the person for renal failure (urine output, serum creatinine, serum sodium and potassium), hepatic insufficiency (serum aminotransferases, bilirubin), cardiac illness (ECG), malaria (peripheral smear study), and thrombocytopenia. Consider CSF study if meningitis is suspected.

If the case has already been treated with paracetamol/ other analgesics, start an NSAID (as per standard recommendations). Monitor for adverse effects from NSAID use. Cutaneous manifestations can be managed with topical or systemic drugs.

Refer cases with any of the following to a higher healthcare centre: pregnancy, oliguria/anuria, refractory hypotension, bleeding disorders, altered sensorium, meningo- encephalitis, persistent fever of more than one week's duration, and extremes of age - persons above sixty years and infants (below one year of age). CURB 65 scoring system may be used for deciding on referrals.

CURB-65 is a clinical prediction rule that has been validated for predicting mortality in community-acquired pneumonia and infection of any site.

The score is an acronym for each of the risk factors measured. Each risk factor scores one point, for a maximum score of 5:

- **C**onfusion
- **U**rea greater than 7 mmol/l (Blood Urea Nitrogen > 19)
- **R**espiratory rate of 30 breaths per minute or greater
- **B**lood pressure less than 90 systolic or diastolic blood pressure 60 or less
- age **65** or older

Source: <http://en.wikipedia.org/wiki/CURB-65>

Encourage activities and advise regarding complications. Exercises like walking on level grounds, active hand movements and proper posturing of joints to avoid contractures must be suggested. Instruct about the activities mentioned above for further home care.

If a serologic test for IgG was done, remember to draw a second blood sample after a gap of 2-4 weeks.

At the tertiary care level (Teaching hospital situations/infectious diseases specialists/advanced care centres)

In cases referred to tertiary care centre,

- Ensure that all above-mentioned processes have been completed.
- Collect blood samples for serology/PCR/ genetic studies as early as possible, if facilities are available.
- Consider the possibility of other rheumatic diseases like rheumatoid arthritis (with the criteria for rheumatoid arthritis diagnosis being fulfilled), gout, rheumatic fever (with modified Jones' criteria) etc.. in unusual cases. Institute therapy with NSAIDS.

- Treat serious complications (bleeding disorders with blood components- platelet transfusions in case of bleeding with platelet counts of less than 50,000 cells per cu mm., fresh frozen plasma, or Vitamin K injections if prothrombin time INR is more than 2, hypotension with fluids/ inotropics, acute renal failure with dialysis, contractures and deformities with physiotherapy/surgery, cutaneous manifestations with topical or systemic drugs, and neuropsychiatric problems with specialist care and drugs). Patients with myopericarditis or meningoencephalitis may require intensive care with regular monitoring, inotropic support, ventilation etc. In cases with ophthalmic complications, standard practice guidelines may be obtained from the ophthalmologists.
- Use hydroxychloroquine 200 mg orally once daily or chloroquin phosphate 300 mg orally per day for a period of four weeks in cases where arthralgia is refractory to other drugs. Before using chloroquine or related compounds in these doses, the peripheral blood smear examination must be done at least twice to rule out malaria.
- If one IgG test only was done earlier, remember to draw a second blood sample after a gap of 2-4 weeks.
- Assess the disability and recommend rehabilitative procedures.

Guiding principles for managing chronic phase

Management of osteoarticular problems

The osteoarticular problems seen with Chikungunya fever usually subside in one to two weeks' time. In approximately 20% cases, they disappear after a gap of few weeks. In less than 10% cases, they tend to persist for months. In about 10 % cases, the swelling disappears; the pain subsides, but only to reappear with every other febrile illness for many months. Each time the same joints get swollen, with mild effusion and symptoms persist for a week or two after subsidence of the fever. Complement mediated damage and persistence of the virus in intracellular sanctuaries have been implicated in occasional studies. Destroyed metatarsal head has been observed in patients with persistent joint swelling.

Management of osteoarticular manifestations follow the general guidelines given earlier. Since an immunologic etiology is suspected in chronic cases, a short course of steroids may be useful. Care must be taken to monitor all adverse

events and the drug should not be continued indefinitely to prevent adverse effects. Even though NSAIDS produce symptomatic relief in majority of individuals, care should be taken to avoid renal, gastrointestinal, cardiac and bone marrow toxicity. Cold compresses have been reported to lessen the joint symptoms.

Disability due to Chikungunya fever arthritis can be assessed and monitored using one of the standard scales. As discussed above, proper and timely physiotherapy will help patients with contractures and deformities. Non-weight bearing exercises may be suggested.; e. g. slowly touching the occiput (back of the head) with the palm, slow ankle exercises, pulley assisted exercises, milder forms of yoga etc. Surgery may be indicated in severe and disabling contractures. The management plan may be finalized in major hospitals, but the follow-up and long-term care must be done at a domiciliary or primary health centre level.

Occupational assistance after detailed disability assessment needs to be provided.

Management of neurological problems

Various neurologic sequelae can occur with persistent chikungunya fever. Approximately 40% of those with CF will complain of various neurological symptoms but hardly 10% will have persistent manifestations. Peripheral neuropathy with a predominant sensory component is the most common (5-8%). Paresesthesias, pins and needles sensations, crawling of worms sensation and disturbing neuralgias have all been described by the patients in isolation or in combination. Worsening or precipitation of entrapment syndromes like carpal tunnel syndrome has been reported in many patients. Motor neuropathy is rare. Occasional cases of ascending polyneuritis have been observed as a post-infective phenomenon, as seen with many viral illnesses. Seizures and loss of consciousness have been described occasionally, but a causal relationship is yet to be found. Anti-neuralgic drugs (Amitriptyline, Carbamazepine, Gabapentin, and Pregnable) may be used in standard doses in disturbing neuropathies.

Ocular involvement during the acute phase in less than 0.5% cases as described above may lead to defective vision and painful eye in a small percentage. Progressive defects in vision due to uveitis or retinitis may warrant treatment with steroids.

Management of dermatological problems

The skin manifestations of Chikungunya fever subside after the acute phase is over and rarely require long term care. However worsening of psoriatic lesions and atopic lesions may require specific management by a qualified specialist. Hyperpigmentation and papular eruptions may be managed with Zinc oxide cream and/or Calamine lotion. Persistent non-healing ulcers are rare. Scrotal and aphthous- like ulcers on the skin and intertriginous areas may be managed by saline compresses, and topical or systemic antibiotics if secondarily infected.

Management of psycho-somatic problems

Neuro-psychiatric / emotional problems have been observed in upto 15% cases. These are more likely in persons with pre-morbid disorders and those with a family history of mood disorders. They may take different forms.

The emotional and psychosocial issues need individual assessment and have to be considered in the social context of the patient and community. Often patients have inadequate information regarding Chikungunya. Broadly, psychosocial support and reassurance may solve some of the problems. A well thought about plan for community support, occupational and social rehabilitation may hold the key for success.

4. Public health measures in the context of clinical case management

Background

The patient in this context becomes the reservoir of infection for others in the household and in the community. Therefore, public health measures to minimize the transmission of infection become imperative to prevent and control the outbreak from spreading.

Case definition

Though case diagnosis can only be made by laboratory means, Chikungunya should be suspected when epidemic occurs with the characteristic triad of fever, rash and joint manifestations.

The Chikungunya case definition here is adapted from that proposed by the European Centre for Disease Control (ECDC):

Clinical criteria: acute onset of fever $>38.5^{\circ}\text{C}$ 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:

- Virus isolation
- Presence of viral RNA by RT-PCR
- Presence of virus specific IgM antibodies in single serum sample collected in acute or convalescent stage.
- Four-fold increase in IgG values in samples collected at least three weeks apart

On this basis, cases are to be categorized as

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

(It may be noted that during an epidemic, all patients need not be subjected to confirmatory tests as above. An epidemiologic link may be enough. Clinical management as of now does not differ between a probable case and a confirmed case)

Minimizing transmission of infection: This can be done in the following ways:

- (1) Risk communication to the household members
- (2) Minimize the vector population
- (3) Minimize the vector-patient contact (Aedes mosquitoes bite during day time, mostly in the morning and late afternoon)
- (4) Reporting to the nearest public health authority/ or the DPMO

Risk communication to the household members

- Educate the patient and other members in the household about the risk of transmission to others and the ways to minimize the risk by minimizing vector population and minimizing the contact with vector

Minimizing vector population

- Intensify efforts to reduce larval habitats in and around the houses; remove stagnant water from all junk items lying around in the household and in the peri-domestic areas
- Stagnating water in flower pots or similar containers should be changed daily or at least twice weekly.
- Introduce larvivorous fish in aquaria, garden pools, etc
- Weeds and tall grasses should be cut short to minimize shady spaces where the adult insects hide and rest during hot daylight hours
- *Drain all water stagnating after rains*
- *Fogging and street sanitation with proper waste management (fogging does not appear to be effective, yet it is routinely implemented in epidemic situation*

Minimize the vector-patient contact

- At household level:
 - Have the patient rest under bed-nets, preferably permethrin-impregnated nets
 - Have infants in the house sleep under similar bed nets
 - Insecticide sprays: bed rooms, closets and crevices, bathrooms, kitchens, nooks and corners; alternatively, coils, mats, vaporizers, etc
 - Have the patient as well as other members of the household wear full sleeves to cover extremities, preferably bright coloured clothes
 - Wire-mesh/ nets on doors and windows

Reporting to the nearest public health authority/or the DPMO

Occurrence of the case in the community needs to be communicated immediately to the nearest public health official for identification of clusters by person, place and time and for expansion of the control measures in the community and district levels.

5. Further reading

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As Chikungunya Fever is a new and emerging disease it has not received sufficient coverage yet in the medical curricula of Member States. Specific treatment is not available, and there is no vaccine for the prevention of chikungunya fever. It has therefore become imperative to develop guidelines, based on the limited clinical experience gathered from managing patients so far, for appropriate management of patients in communities and in health facilities. Experts engaged in managing patients with chikungunya fever in the Region were brought together by the WHO Regional Office for South-East Asia to outline guidelines for managing various situations and stages of the disease. This publication is the end result of that exercise and is intended to assist health-care providers in planning and implementing appropriate care to patients with chikungunya fever according to their actual clinical conditions.



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