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Comparitive evaluation of different systems of medicines and the present scenario of chikungunya in Kerala

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ABSTRACT

Objective: To identify the chikungunya outbreaks in both indoor and outdoor patients in some selected hospitals in our locality and the burden and magnitude of the disease, to compare different system of medicines (allopathic, Ayurvedic, homeopathy etc) and to explore the knowledge, attitude and practices of pharmacists and other health care professionals in the treatment of chikungunya. **Methods:** A six-month study was carried out. Detailed history was taken from the case history, personal interview of doctors and suspected cases. Personal data such as name age, sex, location, date of onset of illness, medical history, general/systemic examination features, drugs used (allopathy, Ayurveda, homeopathy, or traditional) for the treatment, etc. were noted down. A simple questionnaire was prepared and distributed to various doctors practicing various systems of medicines. **Results:** A total of 209 suspected cases were identified from July to December, 2009. People in the age group of 20–40 years were more affected. The study revealed that females were more affected than males. The Grade–III (58.73%) population was more prone to chikungunya than Grade–II (38.75%) and Grade–I (2.87%). It showed that fever, pain in muscles, and sleeping disturbances were the intense symptoms of chikungunya. Myocarditis and arthritis were concomitant diseases which worsened chikungunya symptoms. It also indicated the effective medicine for compliance is nonsteroidal antiinflammatory drugs (NSAIDs). **Conclusions:** From our study we found that in some places there is no proper documentation, even though there are proper guidelines framed by the relevant authorities. It can be concluded from the study that all the systems of medicine are equally important for the management of chikungunya. Additional effort in promoting the guidelines at local level and proper documentation helps to achieve the goal of curbing the chikungunya. It is high time to increase our effort and promote these messages at grassroot level which benefits the society/ community as a whole.

1. Introduction

Chikungunya fever (CHIK) outbreak was observed in India in December 2005. Phylogenetic analysis of the isolated virus showed a central–east African strain that was closely related to the strain from the Reunion Islands[1]. Historically, the first outbreak of CHIK was reported in 1963 in Kolkata, and the last reported outbreak occurred in 1973 in Maharashtra. The reemergence of the virus may have been facilitated by human population migrations in the Indian Ocean region. Chikungunya wave spread to tropical part of Africa, America and Asia[2]. In India first outbreak was recorded in Kolkata in 1963 followed by east coastal area like Chennai, Pondichery, Vellore

and Vishakapattanam in 1964. Later it was recorded in 1965 in central part of India, i.e., Rajmundri, Kakinada and Nagpur Since December 2005, cases of CHIK were reported from several Indian states including Andhra Pradesh, Maharashtra, Karnataka, TamilNadu, and Madhya Pradesh[3]. With one of the best healthcare systems in India Kerala's status has received a severe blow in the past one year due to the outbreak of chikungunya viral fever in the state. Last year, more than 100 people died during the outbreak of the mosquito-borne viral fever in the coastal districts of Alappuza, Kollam and Ernakulam. The present outbreak, which has seen more than 40 people die in the past two weeks in the south and central districts of Kollam, Pathanamthitta, Kottayam and parts of the capital city has raised questions about how good Kerala's healthcare system really is[4]. According to sources, more than 100 000 people are down with fever in the south and central districts of the state and the disease is now spreading to the northern districts as well chikungunya, is caused by an arbovirus

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and transmitted by *Aedes aegypti* (*A. aegypti*) mosquito[5].

Chikungunya virus (CHIKV) is a mosquito-transmitted Alphavirus belonging to family Togaviridae. It was isolated for the first time from a Tanzanian outbreak in 1952[6]. It is responsible for an acute infection of abrupt onset, characterized by high fever, arthralgia, myalgia, headache, and rash. Poly-arthralgia, the typical clinical sign of the disease, is very painful. Symptoms are generally self-limiting and last 1–10 days. However, arthralgia may persist for months or years. In some patients, minor hemorrhagic signs such as epistaxis or gingivorrhagia have also been described. CHIK-V is geographically distributed in Africa, India, and South-East Asia. In Africa, the virus is maintained through a sylvatic transmission cycle between wild primates and mosquitoes such as *Aedes luteocephalus*, *A. furcifer*, or *A. taylori*[7]. In Asia, CHIK-V is transmitted from human to human mainly by *A. aegypti* and, to a lesser extent, by *A. albopictus* through an urban transmission cycle. Since the 1952 Tanzania outbreak, CHIK-V has caused outbreaks in East Africa (Tanzania and Uganda), in Austral Africa (Zimbabwe and South Africa), in West Africa (Senegal and Nigeria), and in Central Africa (Central African Republic and Democratic Republic of the Congo). The most recent epidemic re-emergence was documented in 1999–2000 in Kinshasa, where an estimated 50 000 persons were infected[8]. Since the first documented Asian outbreak in 1958 at Bangkok, Thailand, outbreaks have been documented in Thailand, Cambodia, Vietnam, Laos, Myanmar, Malaysia, Philippines, and Indonesia. The most recent epidemic re-emergence was documented in 2001–2003 in Java, after 20 years. In both Africa and Asia, the re-emergence was unpredictable, with intervals of 7–8 years to 20 years between consecutive epidemics[9]. Since the end of 2004, CHIKV has emerged in the islands of the south-western Indian Ocean. Between January and March 2005, more than 5 000 cases were reported in Comoros. Later in 2005, the virus has circulated in the other islands, i.e. Mayotte, Seychelles, Re´union, and Mauritius. Starting in December 2005, the rainy season gave rise to a renewed epidemic circulation of the virus. Since January 1, 2006, several thousands cases were reported in each of Mayotte, Mauritius, and Seychelles islands[10]. The most affected island is Re´union (total population:770 000), with an estimated 244 000 cases (16 April, 2006). More recently, circulation of the virus has also been documented in Madagascar and in India. In Re´union Island, the first documented cases were patients coming back from Comoros in March 2005. More than 3 000 cases were reported from March to June[11]. Transmission was limited (50–100 cases per week) during the winter season of the southern hemisphere, and a major upsurge was observed from mid-December, with an estimated 12 400 cases in 2005 and an estimated 231 600 cases in 2006 (16 April, 2006). The peak incidence in 2006 was observed during the second week of February, with more than 45 000 cases. The number of cases has now decreased, with an estimated 3 000 cases during the second week of April. Since March 2005, 123 patients with a confirmed CHIKV infection have developed severe clinical signs (neurological signs or fulminant hepatitis) that justified hospitalization in an intensive care unit[12].

The name, chikungunya comes from the Swahili which means “bends up”, reflecting the physique of a person

suffering from the disease. It resembles Dengue and is reported mainly from Africa, South-East Asia including India and Pakistan. It occurs principally during the rainy season. Chikungunya outbreaks typically result in large number of cases but deaths are rarely encountered. The human infections are acquired by the bite of infected *Ae. aegypti* mosquitoes, which are day biters and epidemics are sustained by human-mosquito-human transmission[13]. These mosquitoes usually breed in clean water collections in containers, tanks, disposables, junk materials in domestic and pre-domestic situations. Symptoms of infection generally last for three to seven days after the patient has been bitten by the infected mosquito. After an incubation period of 4–7 days, there is a sudden onset of flu-like symptoms including fever, chills, headache, nausea, vomiting, severe joint pain (arthralgia) and rash. Rash may appear at the outset or several days into the illness; its development often coincides with defervescence, which takes place around day 2 or day 3 of the disease. The rash is most intense on trunk and limbs and may desquamate. Migratory polyarthritis usually affects the small joints. The joints of the extremities in particular become swollen and painful to the touch. Although rare, the infection can result in meningoencephalitis (swelling of the brain), especially in newborns and those with pre-existing medical conditions. Pregnant women can pass the virus to their fetus[14]. Haemorrhage is rare and all but a few patients recover within 3–5 days. Residual arthritis, with morning stiffness, swelling and pain on movement may persist for weeks or months after recovery. A full blown disease is most common among adults, in whom the clinical picture may be dramatic. Severe cases of chikungunya can occur in the elderly, in the very young (newborns) and in those who are immuno compromised[15].

Recent outbreak of chikungunya in some southern states of India, Kerala in particular is alarming. The number of chikungunya cases in Kerala, India has followed an increasing trend since 2005. Outbreak of chikungunya began for the first time in 2006 affecting nearly 70 000 persons from 14 districts and in May 2007, another outbreak surfaced affecting almost all districts. Hence an attempt was made to understand the burden of chikungunya in our locality based on different factors.

2. Materials and methods

Oral consent was obtained from the authorities of various hospitals and individuals prior to study. The criteria for selection of the districts were based on the confirmed cases reported by Kerala state health authorities. Recently more cases were reported from northern part of Kerala than southern states which prompted us to undertake the study in northern parts of Kerala, where our AL Shifa College of Pharmacy is located. Assessibility to the hospitals made our work easier. Suspected cases of chikungunya were identified based on the clinical symptoms guidelines given by state health authorities. Personal data such as name age, sex, location, date of onset of illness, medical history, general/systemic examination features, drugs used (in Allopathic, Ayurveda, Homeopathy, Traditional) for the treatment etc were noted down. We undertook the study to analyze

the burden and magnitude of chikungunya in both indoor and outdoor patients in various primary health center, government hospitals and private hospitals in our locality. This was a six month descriptive study and 209 suspected cases were identified from July to December 2009. During these six months detailed history was taken from the case history, and personal interview of doctors and suspected cases.

Kerala being very strong in traditional systems of medicines like Ayurveda, Unani and Siddha and since we have plenty of herbal medicines in our basket, we undertook the study to explore the knowledge of doctors in various system of medicines and to understand the different drugs used in these systems for the treatment of chikungunya. A simple questionnaire was prepared and distributed to various doctors practicing various systems of medicines. A close ended, simple to understand, and comprehensive question format was deliberately designed to keep away any inadvertent bias interpreting specific responses. Each questionnaire had all questions with two options. Since it was an open ground survey, the doctors were asked to fill details such as name qualification, consulting address. Doctors were clearly informed that the survey was a formal assessment and not related to their final grade. Only descriptive analysis was recorded.

Intensity of chikungunya was determined on the basis of frequency of symptoms in patients. Those symptoms with more than 80% were considered with mark 3 intensity, those having more than 70% but not more than 80% were considered as mark 2 intensity. Symptoms with 50% to 70% cases were considered as mark 1 intensity. Symptoms less than 50% are excluded.

Finally all the data were critically analyzed and tabulated.

3. Results

In this study, out of 209 suspected cases, 99(47.36%) were in the age group of 20–40 years, 77(36.84%) were in the age group of 40–60 years, 17 (8.13%) were in the age group of 60–80 years, 13 (6.22%) were in the age group of 10–20 years and 3(1.43%) in the age group of 80 and above. A total of 144(68.69%) patients were females and 65 out of 209(31.11%) were males. The study revealed that females were more affected than males. A total of 150 (71.77%) were from rural area and 59 (28.23%) were from urban area. The Grade–III (58.73%) population were more prone to chikungunya than Grade–II (38.75%) and Grade–I (2.87%). It showed that fever, pain in muscles, sleeping disturbances were the intense symptoms of chikungunya. Rashes were intense symptoms with 2 mark intensity. Unilateral ankle pain and pain in wrist joints were symptom with one mark intensity (Figure 1).

Myocarditis and arthritis were concomitant diseases which worsen chikungunya symptoms. In the present study arthritis worsen the condition in 6.69% of patients and myocarditis 0.47%. It also indicated that the effective medicine for compliance is nonsteroidal antiinflammatory drugs (NSAIDS) (pain killers) and most doctors prefer NSAIDS for the treatment of chikungunya rather than steroid preparations (Figure 2). It revealed that 66.5% took more than one month for recovery, 19.13% took two months period and 8.61% took 1–2 weeks and 5.74% recovered within one week.

And the maximum case 98% were found in outdoor patients.

The drugs used in treatment and prevention of chikungunya with homeopathy were Eupatorium, Pyrogen, China, Nuxvomica, Gelsimium, Rhus Tox., Arnica, Belladonna, Bryonia, and Ars alb. In systematic homeopathy, Rhustoxid, Ledumpal –qid, Balladonna–qid, Bryonia–qid were used for acute cases, and rhusto×200 bid, Ledumpal 200 bid were used in prevention for 7 days. And 70–80% were relieved in 5 days. The drugs used in treatment and prevention of Chickungunya by ayurvedic method of medication were Amruthadiguggulu (1 gm tds), Rasnaeranda kwatha churna (15 mL tds), Vanathulasi patra, Beruenna(oil), Vilwadi gulika (tab), Sudarshana tablet, Vettumaran gulika., and Amruthotharam kashayam. Five doctors consulted assured the prevention of chickengunya by homeopathy and ayurveda, and they were of the opinion that homeopathy treatment and ayurveda were more effective than modern medicine. All doctors were aware about the efficacy and adverse effects of drugs used in ayurveda, and 60% were aware about homeopathy.

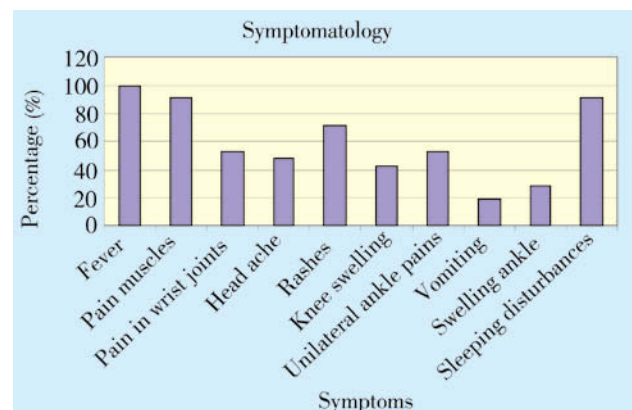


Figure 1. Symptomatology of chikungunya.

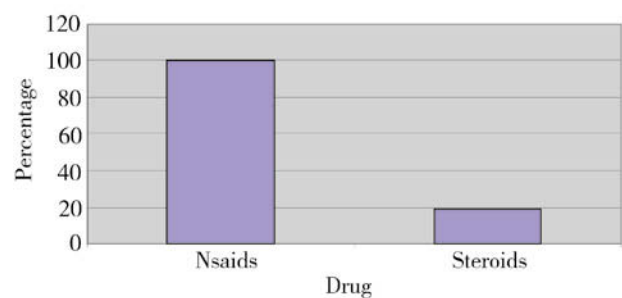


Figure 2. Drug related parameters.

4. Discussion

With one of the best healthcare systems in India, Kerala status has received a severe blow in the recent years due to the outbreak of chikungunya viral fever in the state. Many people died and suffered during the outbreak of the mosquito borne viral fever in the coastal districts of Alappuza, kollam and Ernakulam. The present outbreak of chikungunya in many parts of Kerala has raised questions about how good Kerala healthcare system really is. According to sources,

more than 10 000 people are down with fever in the south and central districts of the state and the disease is now spreading to the northern districts as well. The number of chikungunya cases in Kerala, India, has followed an increasing trend since 2005. From our survey, which was done in a systemic manner with respect to age, it was found that people in the age group of 20–40 years were more affected than the older age. This shows that older generation are more cautious in taking the precautions in terms of hygiene as well as preventing the entry of mosquitoes into the place of living by closing the windows at right time, installing the wire meshes at the doorway windows which helps in aeration but prevents the entry of mosquitoes. In respect to gender wise distribution, females were found to be more prone to chikungunya due to staying more in waterborne area (like cleaning washing etc) and also it may be due to biological difference. Rural area accounts for more number of cases. Most of the places, good hygienic conditions were not been maintained. Contaminated water from the household had not been disposed off properly due to which it has become a breeding center for mosquitoes. Socio-economic factors also have an impact on chikungunya. Most cases, increase in temperature, muscular pain and sleep disturbances, were found to be major symptoms. Patients with the above mentioned symptoms were not able to carry out the daily routine procedure or job which affected them economically too. In this regard, the treatment regimens followed by the physicians were found to be administration of analgesics and antipyretics followed by rest for a minimum period of 1–2 weeks. In very few cases, arthritis and myocarditis were reported. Very few patients were advised to take steroids. With respect to recovery time, few patients recovered within one week and most of the patients took almost one month time to recover and such patients were from the rural area. This shows the severity of the conditions. The study revealed that most patients went to primary health centre and government hospitals for the treatment of chikungunya and majority were found to be outdoor patients. The reason in avoiding private hospitals may be due to lack of interest in taking the costly medication provided by corporate sector hospital.

4.1. Chikungunya treatment in Ayurveda

Ayurveda is traditional Indian medicine and also is a popular alternative medicine in India. Ayurveda medicines are usually natural drugs and hence with few side effects. Our findings revealed that, since there is no new medicine for chikungunya in Allopathy, there is an increasing trend among people in Kerala turning to traditional Indian medicines especially Ayurveda. In comparative evaluation of different system of medicines and present scenario of chikungunya in Malabar, Kerala, in case of Ayurvedic medicine, questionnaire were distributed to 5 doctors and collected the feedback, regarding medicines, treatment available, diagnosis etc. The study reveals that many numbers of medicines were prescribed including Vilvadi

Gulika, Sudarsanam Gulika, Amritarishta. Vettumaran gulika, Amruthotharam kashayam, Amruthadiguggulu (1 gm tds), Rasnaeranda kwatha churna (15 mL tds), Vanathulasi patra, Dhanvantaram Gutika etc. The recovery of the patients normally takes place within three days if it is in early stage. Most of the doctors assured that Ayurvedic system of medication and treatment could cure the patient at earlier period without much side effects, since the preparation are from natural source without any added artificial preservations or artificial exceptions. All the doctors participated in the survey (100%) assured that Ayurvedic medicines were more effective than other systems of medicines and they were aware about the efficacy and adverse effects of drugs used. The study revealed that the condition of chikungunya worsen in patients who have arthritis. One observation noted during the study is that there is a wide belief among people in Kerala that, the application of local herb *Chromolaena odorata* (Communist pacha in local language) can be used for the treatment of chikungunya especially in pain relief. Communist pacha is a local leaf available in Kerala, which is effective in treating joint pain. Most of the doctors were aware of this which is an additional therapy in chikungunya. Ayurveda is a system wherein the patients were asked to follow a strict diet regimen avoiding coffee, tea, cool drinks and other similar food materials which may interfere in the treatment status. Some practitioners of Ayurveda claim that a medicine called Panchathikta Kashayam can cure chikungunya. It is a very bitter drug. Ayurveda massage is also administered for joint pain relief. Herbs such as sacred basil (Tulsi), carrot and grapes are usually recommended as a relief for the pain and fever. Since these are natural herbs and vegetable there is no risk in trying them out. Ayurvedic treatment of chikungunya uses herbal drugs, but patients have to be very careful since there are a large number of unlicensed Ayurvedic practitioners and some of them are known to add steroids in medicines for quick benefit. Ayurvedic method of living offers a solution to the problems of viral fever and almost all types of diseases. Ayurveda attributes the reasons of spread of diseases to the pollution of air, water and land and its imbalances in the body.

4.2. Homeopathic treatment of chikungunya

In the case of homeopathy, feedback was obtained from 5 doctors. The treatment was symptomatic, provisional diagnosis was done and the patients were asked not to follow any other system of medicine during homeopathy treatment. Only 60% of the homeopathy doctors were aware about the efficacy and adverse effects of drugs used. Most of the doctors (100%) believe that homeopathic medicine can cure chikungunya completely. (Assessment is based on the feedback obtained from certain doctors in our locality, in other locality, doctors may be aware of adverse effects). Cardiac, respiratory and arthritis can worsen chikungunya according to homeopathic system. According to homeopathic experts effective drugs are available to

prevent as well as to speed up recovery from chikungunya. Eupatorium Perfoliatum Q (tincture, 3 to 5 drop doses) can prevent chikungunya infection. Other medicines prescribed for the disease include Pyrogenum, Rhus tox, Cedron, Influenzinum, China, Arnica. Ledumpal, bryonia, Belladonna, Nuxvomica. Etc. The study reveals that these homeopathic medicines were very effective for relieving complaints during chikungunya. . The duration of illness was reduced. The study reveals that, homeopathic medicines were very effective and gave about 90–95% protection, and they were able to go to work in 2–3 days.

Though the growing concern about chikungunya is increasing at logarithmic rate, day after day, month after month, more commitment and proper massive awareness campaign from the donors and states is needed for the successful mitigation of chikungunya. Different system of medicine has much to offer in preventing chikungunya, but the wide spreading of disease is going high in alarming rate in developing countries because of the population and polluted environment. Keeping an unpolluted surrounding and clean environment is vital in the disease management which lacks in our locality.

Compared to other systems of medicine, people in our locality prefer Ayurveda, since it is devoid of side effects and the cure rate is also very high with this system of medicine. The local herb communist pacha (*Chromolaena odorata*) which is a new finding can cure the chikungunya (Especially pain and swelling), and has good potential in the future. Ayurvedic experts should tap/exploit the potential of this herb, since people claim that it has curing effect and efficacy. Multispeciality hospitals tackle the chikungunya menace but the extend of participation in mitigating the chikungunya is less. From our study we found that in some places there is no proper documentation, even though there are proper guidelines framed by the relevant authorities. It can be concluded from the study that all the systems of medicine are equally important for the management of chikungunya. Additional effort in promoting the guidelines at local level and proper documentation helps to achieve the goal of curbing the chikungunya. It is high time to increase our efforts and promote these messages at grass root level which benefits the society/community as a whole.

Conflict of interest statement

We declare that we have no conflict of interest.

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