Emergence of Chikungunya Cases From Urban to Rural Areas of Sindh: The Role of Travel and Climatic Conditions

Jamil Ahmed Soomro[1], Suhail Ahmed Bijarani[2], Abdul Manan Soomro[3], Liaquat Ali Halo[4], Allah Bachayo Rajar[5], Masood Ali Qureshi[6].

Assistant Professor, Department of Community Health Sciences, Muhammad Medical college, MirpurKhas
2. Assistant Professor, Faculty of Community & Public Health Sciences, Department of Community Health Sciences, Liaquat University of Medical & Health Sciences.
3. Associate Professor, Faculty of Community Medicine and Allied Sciences, PUMHSW-SBA
4. Senior Medical Officer, National Institute of Child Health Karachi
5. Associate Professor, Department of Community Health Sciences, Muhammad Medical college, MirpurKhas
6. Demonstrator, Faculty of Community Medicine and Allied Sciences, PUMHSW-SBA

Corresponding author:
Dr. Jamil Ahmed,
Assistant Professor,
Department of Community Health Sciences, Muhammad Medical college, MirpurKhas 03332855283,
jamiljan197@hotmail.com

ABSTRACT:

Background: Chikungunya is aviral disease transfer through bite of mosquito. The disease is presented with fever and joint pain.The virus is spread from human-human by the bites of infected femalemosquitoes of Aedes aegypti and Aedes albopictus species. Thefirst outbreak of Chikungunya reported in Tanzania in 1952.Chikunguniais an emerging infection, in Pakistan it has spread from urban areasto rural areas of Sindh.

Objective: To investigate the pattern of Chikungunya casesand to further explore its relationship with the travel and climatic conditions.

Methodology:A cross sectional survey was conducted from January 2017 to September 2017. A structured questionnaire was developed, and information was collected on weekly basis from print and electronic media, physician clinics and community sources. The data was entered and analyzed on SPSS software version 22.

Results: Study has documented 4100 suspected cases with 516 cases whosesample were collected by Health Department Teams and sent to NIH Islamabad out of these 78 tested positive showing case positivity rates 15.11%. There was long and continuous rain fall in July and August month of 2017 and there was rise in temperature hence showing connection between Chikungunya virus and climate change and of long duration rain fall. Most of the patient are uneducated poor and living in resource poor healthfacilities, located at long distance and less in number. People travel to visit their relative to India or go for jobs to Karachi.

Conclusion: Chikungunyais an emerging infection, firsttime spread in Tharparkar, possibly from Indian border or from Karachi, where people of Tharparkar either have relative or they visit India to meet there relatives, also people frequentlyvisit Karachi for job, education, purchase and visit.Chachro Taluka was affected more than other Talukas of Tharparkar possibly due to the frequent travel by the residents.The faster transmission of chikungunya infection in Tharparkar might be due to the optimum temperature conditions, availability of mosquito (Aedes Aegypti and Aedeses Albopictus) and that influence chikungunya transmission.

Key words: Chikungunya, Tharparkar, border, Karachi, Aedes

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INTRODUCTION

Chickungunyais an emerging infection and has spread from urban areas to desert of Tharparkar since and is manifesting fever and joint pain so for 54 villages of Tharparkar has been affected in 2017 it is vector borne diseases by mosquito Aedes Aegypti and Aedeses Albopictus it is caused by virus named from Tanzania since 1952.[1-2] Febrile female patient and is reported from 66 countries in the world including Pakistan,

India and Indonesia. It is an RNA virus genus alpha virus and family togaviridae.

Chikungunya is a word from Tanzanian kimakonde language whichmeans downwards posture due to joint pain. Pakistan is facing out break since November 2016.[3-4] In another Muslim country Yemen, there were 1000 cases and 75 deaths reportedin 2010In Delhi 12000 cases with15deathswere reported in 2016.[1, 2. 3, 4] National Institute of Health Islamabad and WHO consider Chikungunya reached from Delhi wherefew monthsago outbreakoccurred. Our Borders, airports and Rail travel neglected NIHwarning.[5]

Chikungunya historyin Pakistan dates back in 1983 when this virus detected in rodents and human serum by Darwesh.[6] Pakistan is 7th country where climate changes severe in the world. InLahore in 2011, three cases were detected in Lahore.[7],[8]A full blown epidemic started in Karachi in 2016 with more than 3000 cases and Chikungunyaalso reached to Tharparkar and this problem is still unseeing.[8,9] Chikungunya is long distance causing virus 7 Indian Ocean countries are favorable territories and islands of vector and virus small disposable water containers are breeding sites for urban Aegypti mosquito and virus has reached to Italy and America[8] Three genotype of Chikungunya (ChikV) western African, ,east central south African (ECSA)and AsianChik A 226 is variant responsible for first outbreak in IndianOcean.[9-12] Climate change anddraught has triggered Chikungunya incoastal eastAfrica has been reported.The climatic factors that impact the chikungunya disease transmission includes rainfall, humidity and temperature.[8-9]

The risk of becoming sick or loose healthy [11] life years is 500 times more because of climate change and weak health care system . Till vaccine is not developed chikungunya is global threat it has all potentials to be used as bio-weapon. It is sickness which put young people to use wheel chair [12-15] There are no vaccine available for this virus, however, lot of trails are under progress in many countries to contain this viral disease.[16-17] However, mosquito control and eradication are in place in Pakistan like other tropical and subtropical countries to counter all mosquito borne diseases. The management strategy for chikungunya fever include symptomatic treatment such as analgesic and anti-pyretic drugs.[18] Many study revealed that the chikungunya fever is not deadly, but it's treatment is highly recommended toavert fever, nausea, joint pain and headache. Therefore, it's recommended drugs of choicesare paracetamol and acetaminophen. [18-20]

MATERIAL AND METHODS

Our study aimed to investigate the pattern of Chikungunya cases and to further explore its relationship with the travel and climatic conditions. We used a Cross Sectional Study design to accomplish above objective. The data was collected from January 2017 To September 2017. A standard proforma was developed, validated and piloted before data collection. The data collectors were hired to gather data on weekly basis from print and electronic media, area physicians, and any person reporting on Chikungunya fromTharparkar district.

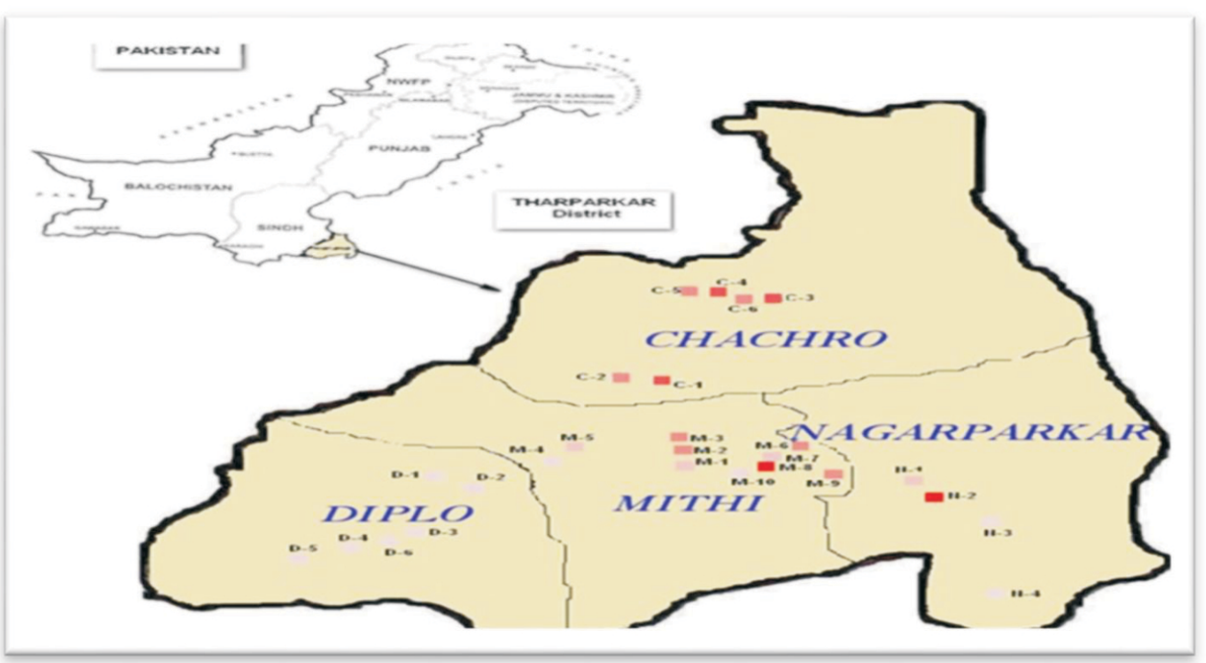


Figure 1: Map of Tharparkar showing district boundaries

RESULTS

Table 1 below shows chickungunya cases in Pakistan, Sindh and Tharparkar. According to the table 34106 cases of Chickungunya were reported in all over Sindh and Pakistan from November 2016 to October 2017. (Table1)

Table 2; presenting the case positivity rate in Pakistan and Tharparkar. This shows that in Pakistan, out of 30000 cases 4000 were tested positive in the laboratory showing 13.33% positivity rate. While in Tharparkar, from various sources 2000 cases have been reported as chikungunya fever cases the health department Sindh sent 567 samples to National Institute of Health, Pakistan (NIH). This shows that diagnostic system in Pakistan can cater 13-28% of total reported cases.

Table3 below shows the mortality rate due to Chickungunya in Tharparkar, Lahore and Rawalpindi. It shows that in Lahore, deaths are 15, in Rawalpindi 78, in Tharparkar 5 (unconfirmed) and in Karachi and other parts of Pakistan deaths are not reported.

Table 4 shows case positivity rate from 516 samples sent by health department for confirmation, 78 (15.11%) tested positive in Tharparkar. While in rest of the country 13.33% cases tested positive. Either the climate difference is virulence of virus is different in Tharparkar.

Table 5 shows the situation in Karachi, where 6 districts have been affected. In Karachi there are 18 towns, the highest number cases in Malir district and lowest in district Korangi. Total 3455 cases have been reported from Karachi but no death is confirmed or reported. This shows that virus virulence is less or health care facilities are more effective In Karachi.

Table 6 shows the latest figures from the multiple sources of Chikungunia cases in Sindh and Tharparkar as shown in figure 2. Total 4511 cases were reported from Karachi which 3455 (76.6%), Tharparkar 646 (14.3%) cases and rest of Sindh 410 (9.1%) cases. This trend shows that southern Sindh which is near to Arabian Sea is suffering more in comparison with the northern Sindh. This is important that Hyderabad which is the midpoint and big city is safe so far.

Table1: Table showing cases of Chickungunya in Pakistanand Tharparkar District 2016-2017

Area	No. of cases
Pakistan	30000
Sindh	3455
Tharparkar	516
Sanghar	04
Umerkot	01
Total	34106

Source: Lancet , Dawn and Dengue Control Programme Sindh

Table 2 Showing Case positivity Rate in Pakistan and Tharparkar

Area	Reported Cases	Samples sent to Lab.	%
Pakistan	30000	4000	13.33
Tharparkar	2000	567	28.35

Source: Lancet ,Dawn and Dengue Control Programme Sindh

Table3: Showing cases in Delhi and Yamen Karachi and Tharparkar deaths

Cases	Death	
12000 Rawalpindi	15	Confirmed
2000 Tharparkar	05	Unconfirmed/ Media
1000 Lahore	78	Confirmed
3000 Karachi	00	unconfirmed

Source: Tribune news paper Pakistan

Table4: Total Case sent for sample testing in Tharparkar4th August to 30 October 2017 including reported figure in previous months

Cases identified	4100
Test Positive	78
Cases sent for test	516
Percentage	15.11%

Sources: Regional News paperKawish and KTN and SAMMA TV, Sindh TV News, Mehran TV Reportsand correspondence voice and live reporting august to October 2017

-Table 5Chikungunya cases showing in cases in Karachi

District	No of cases	Percentages
Karachi	3455	76.6%
Tharparkar	646	14.3%
Other Districts	410	9.1%
Total	4511	100%

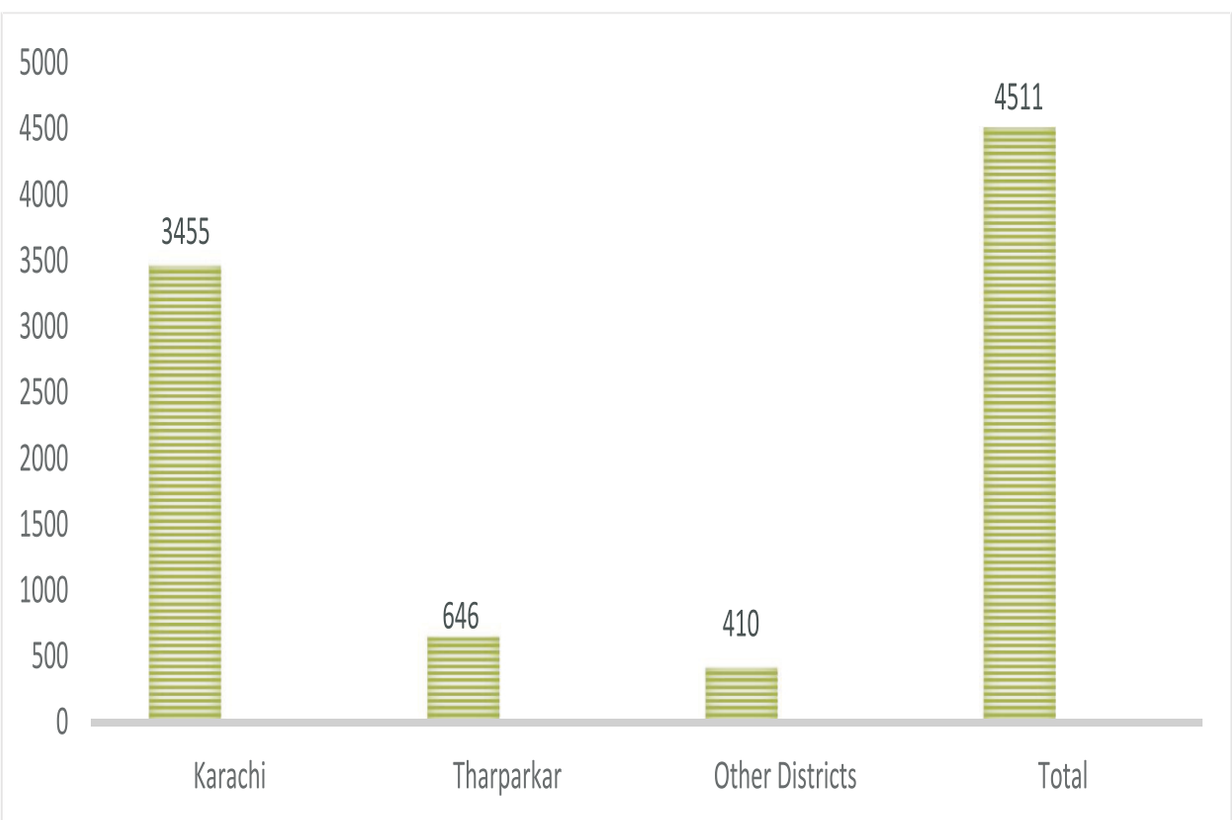
Source: National Institute of Health, Islamabad

Table 6 showing cases of chikungunya Sindh 2016-17

Total Distract	Case	Percentage %
Malir	1740	50%
Central	156	4.3%
South	180	5.2%
East	156	4%
West	1212	35%
Korangi	11	0.3%
Total	3455	

Source: National Institute of Health, Islamabad

Figure 2.Comparison of Cases of Chikungunya in Districts of Sindh



DISCUSSION

Study has documented 4100 suspected cases with 516 cases whose sample were collected by health department teams and sent to NIH Islamabad out of these 78 tested positive showing case positivity rate 15.11 % there is long and continuous rain fall in July and august month and temperature is also on rise hence showing connection between Chikungunia virus and climate change and rain fall of long duration most of them are uneducated poor and living in resource poor and less number of health facilities and people travel to visit their relative or go for jobs.

This study is showing that Chikungunia is occurring in epidemic form and health care delivery system and diagnostic facilities are very much deficient as world literature is showing that islands in Indian oceans are the epicenters since 2007 and is impacting Europe and Americas where Chikungunya is emerging we are next neighbor and southern Sindh which is short distance from Indian Ocean, is showing Chikungunya epidemic and ocean city of Karachi reporting 76.6% cases, Tharparkar 14.3% cases and others 9.1%. It may move up country if it is not contained in Southern province of Pakistan with focus on Karachi and Tharparkar. Border from India at Lahore and Khokrapar district.[21-25]

Chikungunya disease is not new in Pakistan, the occurrence of anti- Chikungunya antibodies has been evident in mouse and human serum since the 80s. However, almost three decades after, the first cases of Chikungunya disease were identified from Sindh Province and the rest of country, with cases emerging to rest of the provinces in the mid of 2017. Nevertheless, a speedy decline in cases was witnessed by the beginning of 2018, after the winter season, which might be due to the restricted vector (mosquitoes) activity. The Chikungunya disease testing was done at National Institute of Health in Islamabad (see table 4 and table 5) the only state laboratory providing diagnostic services for Chikungunya infection diagnosis. The available data further revealed the significance of population social mobility and the presence of mosquito vectors *(A. albopictus and Aedes aegypti)* as major factors supportingeffective virus transmission of Chikungunya virus in Pakistan.[5,15,23]

CONCLUSION

Chikungunia is emerging infection first time spread in Tharparkar from India border or from Karachi where people of Thar either have relatives they visit or travel for labour domestic And other low paid jobs Chachro Taluka is affected more than other Talukas of Tharparkar desert.The faster transmission of chikungunya infection in Tharparkar might be due to the optimum temperature conditions, availability of mosquito (Aedes Aegypti and Aedeses Albopictus) and that influence chikungunya transmission.In order to halt the spread of Chikungunia in future, there is urgent need of consolidated program for vector control, improved diagnostic capacity and highly skilled surveillance team supported team and proper policy to ensure border enforcement measures as a part of public health priority.

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