

Short-term pregnancy outcomes in patients chikungunya infection: An observational study

Suruchi Gupta¹, Nikhil Gupta^{2,3,4}

¹Department of OBG and GYNE, Maternity and Gyne Hospital, RK Puram, Delhi, ²Post Doctoral Fellow, Clinical Immunology and Rheumatology, CMC, Vellore, Tamil Nadu, ³Senior Research Fellow Rheumatology, AIIMS, ⁴Currently Working, Consultant Rheumatology, Max Hospital, Shalimar Bagh, Delhi, India

ABSTRACT

Background: Maternal to fetal transmission of chikungunya infection is reported in various studies. However, there is no study from India that looked at the pregnancy outcomes in patients infected with chikungunya. Thus, we planned an observational study that looked at the short-term outcomes of chikungunya infection on pregnancy outcomes. **Materials and Methods:** It was an observational study conducted at a private clinic in New Delhi from August 2016 to October 2016. We recruited 150 consecutive pregnant females from the outpatient that were suspected chikungunya infection and subsequently tested positive for the same. Those patients who fulfill the inclusion and exclusion criteria would be followed till 10 days including the time till fever subsided. Pregnancy outcomes would be noted in these subjects based on history, examination, and investigations. **Results:** Out of 150 patients, 141 (94%) recovered completely within 10 days of onset of symptoms. Only nine patients had persistent arthralgias. In our study, mean age (years) \pm std was 24.52 ± 3.765 , mean period of gestation (months) \pm std was 25.62 ± 13.475 , and mean period of gestation at delivery (months) \pm std was 36.36 ± 3.225 . Most of our patients, 75 (50%) were in 2nd trimester, 24 (16%) were in first trimester, and 51 (34%) in third trimester. Pregnancy complications were seen in 30 (20%) patients. Preterm delivery (<36 weeks) were seen in 11 (7.33%), premature rupture of membranes were seen in 5 (3.33%), decreased fetal movements in 4 (2.67%), intrauterine deaths in 4 (2.67%), oligohydromnios in 3 (2%), and preterm labor pains 3 (2%). There were six patients who underwent delivery at term. In our study cohort, 30 (20%) developed adverse pregnancy outcomes which were maximum during third trimester -24/30 (80%). **Conclusion:** Chikungunya infection in pregnancy is associated with increased pregnancy morbidity and fetal mortality.

Keywords: Chikungunya, intrauterine death, morbidity, pregnancy, preterm delivery

Introduction

Chikungunya fever is caused by chikungunya virus (CHIKV) which is an alphavirus of the Togaviridae family; their potential vectors are aedes mosquito (1*). CHIKV has caused numerous epidemics especially in Africa, Indian subcontinent, and countries of Southeast Asia.^[1-3] Clinical manifestations of chikungunya fever are fever, headache, myalgia, exanthema, and arthralgia. Arthralgia is its most pronounced symptom which may persist in some patients for months to years and may evolve into disabling chronic arthropathy (2, 3*) Organ

involvement as neurological and cardiac is limited to case reports.^[4,5] Chikungunya infection has been reported to affect pregnancy outcomes. CHIKV can be transmitted vertically from mother to fetus. The first case of virus transmission from mother to child at birth was reported in February 2006; from Reunion island.^[6,7] There are reports of spontaneous abortion after an infection by chikungunya virus.^[8] It has been found that chikungunya virus produces cytopathic effects in cellular lines as Vero cells, BHK-21, and HeLa.^[9]

To the best of our knowledge, there is no study showing the impact of chikungunya infection on pregnancy outcomes from a country like India where this infection occurs as an epidemic. Thus, we decided to carry out this study looking at the short-term

Address for correspondence: Dr. Nikhil Gupta, C-158, Pushpanjali Enclave, Pitampura, Delhi -110 034, India. E-mail: drnikhilguptamamc@gmail.com

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_274_18

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Gupta S, Gupta N. Short-term pregnancy outcomes in patients chikungunya infection: An observational study. J Family Med Prim Care 2019;8:985-7.

outcomes of pregnancy in patients infected with chikungunya virus.

Materials and Methods

A prospective, observational study shall be conducted at a private rheumatology clinic from August 2016 to October 2016. The study observed the short-term outcome of chikungunya infection on pregnant females. We aimed to study the short-term outcome on pregnancy following chikungunya infection.

Pregnant females who presented to the outpatient clinic with symptoms of fever were included in the study. These patients were screened for the etiology of fever. Those patients with suspected chikungunya fever (fever with arthralgia) were included in the study. A confirmatory serology was sent for case confirmation. A total of 150 consecutive pregnant patients who tested positive for the serology were included in the study. Patients with negative serology were excluded. chikungunya serology was done and immunoglobulin M (IgM) detection assays were done by Euroimmune capture enzyme linked immunosorbent assays.

Inclusion criteria

1. Pregnant females with confirmed chikungunya

Exclusion criteria

1. Fever etiology other than chikungunya infection
2. Pregnant females with other coexisting disease/comorbidity or fetal disease or defect.

Those patients who fulfill the inclusion and exclusion criteria were followed till 10 days including the time till fever subsided. Pregnancy outcomes were noted in these subjects based on history, examination, and investigations.

Statistical analysis

The results are expressed as mean \pm standard deviation. The clinical manifestations and outcomes were expressed as percentages.

Results

We did an observational study and looked at the short-term outcome (10 days) of the pregnancy in patients who developed chikungunya infection during the gestational period. We included patients who were seropositive for chikungunya. Patients of chikungunya were managed by high fluid intake, paracetamol, nonsteroidal anti-inflammatory drugs – diclofenac 100 mg twice a day. Baseline characteristics of our cohort has been shown in Table 1. Out of 150 patients, 141 (94%) recovered completely within 10 days of onset of symptoms. Only nine patients had persistent arthralgias.

Among the patients recruited in our study, 63 (42%) were primigravida, 50 (33.3%) were second gravida, and third gravid

were 37 (24.7%) in number. In our study, most of the women were nullipara, i.e., 52 (34.67%), 44 (29.33%) were para 1; 32 (21.33%) were para 2 and para 4 were 22 (14.87%).

Most of our patients 75 (50%) were in second trimester, 24 (16%) were in first trimester, and 51 (34%) in third trimester.

During this 10-day period Bleeding was not seen in any patient.

Complications of pregnancy were seen in many patients as shown in Table 2.

Out of 150 patients with chikungunya infection, 30 (20%) developed adverse pregnancy outcomes. Most of the adverse pregnancy outcomes occurred during third trimester – 24/30 (80%), while rest 6 (20%) adverse outcomes occurred during second trimester and none during first trimester.

There were six patients who underwent delivery at term.

Out of the 17 deliveries, 11 were caesarian and 6 were normal vaginal deliveries.

Discussion

Chikungunya infection is a re-emerging infection and is becoming a major public health problem in India.^[10] There are a few studies which have shown that chikungunya virus can be transmitted from mother to fetus. Early maternal–fetal transmission of chikungunya virus before 16 weeks of gestation has also been described which has resulted in fetal deaths.^[11] There are studies showing that when maternal infection occurs at the end of pregnancy, due to the higher viral concentrations most of the neonates develop complications.^[12]

Table 1: Shows the baseline characteristic of patients with chikungunya infection

Parameters	n=150
Mean age (years) \pm std	24.52 \pm 3.765
Rural:urban	24:26
Mean period of gestation (months) \pm std	25.62 \pm 13.475
Mean duration of fever (days) \pm std	4.92 \pm 1.007
Arthralgia present	144 (98%)
Maculopapular rash	135 (90%)
Mean period of gestation at delivery (months) \pm std	36.36 \pm 3.225

Table 2: Showing the short-term pregnancy outcomes in patients with chikungunya infection

Pregnancy outcomes	n=150
Preterm delivery (<36 weeks)	11 (7.33%)
PROM	5 (3.33%)
Decreased fetal movements	4 (2.67%)
IUD	4 (2.67%)
Oligohydramnios	3 (2%)
Preterm labor pains	3 (2%)

PROM: Premature rupture of membranes; IUD: Intrauterine death

With the above data, we devised a study to find the short-term outcomes of pregnant females who were infected with chikungunya virus. We found that 30 (20%) pregnant females with this infection developed adverse pregnancy outcomes as preterm delivery, premature rupture of membranes, decreased fetal movements, intrauterine death, oligohydramnios, and preterm labor pains.

The effect of chikungunya virus on pregnancy outcomes have been studied in some studies as Done at Re-union island,^[13] in the Groupe Hospitalier Sud-Reunion cohort study,^[14] CHIMERE (“Chikungunya Mere-Enfant”) cohort study^[15] and 2004–2006 Family Allowance Office (41,665 deliveries) and Mother and Child Welfare (42,259 neonates) records.^[16]

There is no convincing evidence that chikungunya virus exposure in the first trimester of gestation is linked to an increased risk for miscarriage or congenital malformation.^[15,16]

Conclusion

These results will spread awareness about the possibility of mother-to-child transmission of chikungunya virus and its consequences. Thus, such knowledge may help the specialists to improve its future management.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

- 1* Raimunda do Socorro da Silva Azevedo, Consuelo Silva Oliveira, Pedro Fernando da Costa Vasconcelos, et al. Chikungunya risk for Brazil. *Rev Saúde Pública* 2015;49:58.
- 2,3* Das T, Jaffar-Bandjee MC, Hoarau JJ, Krejbich Trotot P, Denizo M, Lee-Pat-Yuen G, et al. Chikungunya fever: CNS infection and pathologies of a re-emerging arbovirus. *Prog Neurobiol*. 2010;91:121-9.
- Tesh RB. Arthritides caused by mosquito-borne viruses. *Ann Rev Med*. 1982;33:31-40.
1. Muyembe-Tamfum JJ, Peyrefitte CN, Yogolelo R, Mathina Basisya E, Koyange D, Pukuta E, et al. Epidemic of chikungunya virus in 1999 and 2000 in the Democratic Republic of the Congo [in French]. *Med Trop (Mars)* 2003;63:637-8.
2. Lam SK, Chua KB, Hooi PS, Rahimah MA, Kumari S, Tharmaratnam M, et al. Chikungunya infection—an emerging disease in Malaysia. *Southeast Asian J Trop Med Public Health* 2001;32:447-51.
3. Laras K, Sukri NC, Larasati RP, Bangs MJ, Kosim R, Djauzi, et al. Tracking the reemergence of epidemic chikungunya virus in Indonesia. *Trans R Soc Trop Med Hyg* 2005;99:128-41.
4. Mazaud R, Salaun JJ, Montabone H, Goube P, Bazillio R. Acute neurologic and sensorial disorders in dengue and chikungunya fever [in French]. *Bull Soc Pathol Exot Filiales* 1971;64:22-30.
5. Maiti CR, Mukherjee AK, Bose B, Saha GL. Myopericarditis following chikungunya virus infection. *J Indian Med Assoc* 1978;70:256-8.
6. Robillard PY, Boumahni B, Gérardin P, Michault A, Fourmaintraux A, Schuffenecker I, et al. Vertical maternal fetal transmission of the chikungunya virus. Ten cases among 84 pregnant women [in French] *Presse Med* 2006;35:785-8.
7. Ramful D, Carbonnier M, Pasquet M, Bouhmani B, Ghazouani J, Noormahomed T, et al. Mother-to-child transmission of chikungunya virus infection. *Pediatr Infect Dis J* 2007;26:811-5.
8. Touret Y, Randrianaivo H, Michault A, Schuffenecker I, Kauffmann E, Lenglet Y, et al. Early maternal-fetal transmission of the chikungunya virus. *Presse Med* 2006;35:1656-8.
9. PAHO/CDC. Preparedness and response for chikungunya virus introduction in the Americas. Washington: PAHO/CDC; 2011.
10. Krishnamoorthy K, Harichandrakumar KT, Krishna Kumari A, Das LK. Burden of chikungunya in India: Estimates of disability adjusted life years (DALY) lost in 2006 epidemic. *J Vector Borne Dis* 2009;46:26-35.
11. Gérardin P, Sampéris S, Ramful D, Boumahni B, Bintner M, Alessandri JL, et al. Neurocognitive outcome of children exposed to perinatal mother-to-child chikungunya virus infection: The CHIMERE cohort study on Reunion Island. *PLoS Negl Trop Dis* 2014;8:e2996.
12. Gérardin P, Couderc T, Bintner M, Tournebize P, Renouil M, Lémant J, et al. Chikungunya virus-associated encephalitis: A cohort study on La Réunion Island, 2005-2009. *Neurology* 2016;86:94-102.
13. Lenglet Y, Barau G, Robillard PY, Randrianaivo H, Michault A, Bouveret A, et al. Infection à Chikungunya chez la femme enceinte et risque de transmission materno-foetale. Etude dans un contexte d'épidémie en 2005-2006 à l'île de La Réunion. *J Gynecol Obstet Biol Reprod (Paris)* 2006;35:578-83.
14. Gérardin P, Barau G, Michault A, Bintner M, Randrianaivo H, Choker G, et al. Multidisciplinary prospective study of mother-to-child chikungunya virus infections on the island of La Réunion. *PLoS Med* 2008;5:e60.
15. Fritel X, Rollot O, Gérardin P, Gaüzère BA, Bideault J, Lagarde L, et al. Chikungunya virus infection during pregnancy, Reunion, France, 2006. *Emerg Infect Dis* 2010;16:418-25.
16. Fritel X, Catteau C, Calliez F, Brodel A, Vaillant JL, Ansquin H. Chikungunya outbreak, pregnancy outcome and perinatal mortality: Observational study about 40,000 pregnancies and deliveries on Réunion Island, during 2004-2006. In: *Proceedings of the 13th International Congress on Infectious Disease*, 2008 June 19-22, Kuala Lumpur. Abstract published in: *Int J Infect Dis* 2008;12(Suppl 1):e328.