

Study of process of intervention to control leptospirosis through chemoprophylaxis

R Chudasama, N Godara, R Srivastava, V Desai

Citation

R Chudasama, N Godara, R Srivastava, V Desai. *Study of process of intervention to control leptospirosis through chemoprophylaxis*. The Internet Journal of Infectious Diseases. 2008 Volume 7 Number 2.

Abstract

Objectives: (1) to reduce mortality, as far as possible, due to leptospirosis with intervention of chemoprophylaxis in two sampled villages, (2) to observe the process of distribution of doxycycline, & (3) to evolve the strategy of implementation of chemoprophylaxis in selected villages. **Material & Methods:** One village each from two Primary Health Centres (PHCs) was identified, which had reported cases of leptospirosis and deaths in the past 5 years. Pipalgabhan village from Sadakpor PHC and Malvada village from Hond PHC were selected for the study. Doxycycline capsule, 200 mg orally, was administered weekly (every Monday). Two methods used for doxycycline capsule distribution, in Malvada village house to house approach was used while in Pipalgabhan village capsules were distributed through booths. **Results:** In first round of chemoprophylaxis, 287 (97.6%) eligible people were given doxycycline in Malvada village. In Pipalgabhan village with target population of 3353, only 1402 (41.8%) people have taken doxycycline chemoprophylaxis on first Monday of this study. Not a single case was reported from Malvada village with such a good compliance. In Pipalgabhan village, 3 suspected cases of leptospirosis were reported. **Conclusion:** House to house approach is more acceptable than booth approach for doxycycline chemoprophylaxis. Patient compliance was also very good with house to house approach.

INTRODUCTION

Leptospirosis is a spirochetal zoonosis that may cause a wide spectrum of clinical manifestations in humans. The principal syndromes include subclinical infection, self limited anicteric febrile illness and a severe illness known as Weil's syndrome (1). The causative agent, *Leptospira interrogans*, is distributed worldwide but is more common in wetter climates. *Leptospira* infects rats and other rodents which excrete the pathogen by urination. The organisms can survive in water for long periods of time, such as 15 days. Pathogenic leptospires rapidly invade the human bloodstream after penetrating skin or mucous membranes. The incubation period in humans ranges from two to twenty-six days, with an average of ten days (2), and the attack rates may range from 2 to 8 percent (3). Takaufigi et al demonstrated unequivocally that doxycycline is both an effective and acceptable prophylaxis for leptospirosis before exposure, and suggested that it might also be effective therapeutically (4). For many decades there has been controversy about the efficacy of antibiotics in the treatment of human leptospirosis, because few controlled studies have been conducted. In anicteric leptospirosis, oral doxycycline was reported to significantly reduce the course of the disease

and to prevent leptospiuria (5). In this study, we attempted to determine the usefulness of doxycycline for conferring protection against leptospirosis in an endemic area of South Gujarat region. The study was planned with following objectives: (1) to reduce mortality, as far as possible, due to leptospirosis with intervention of chemoprophylaxis in two sampled villages, (2) to observe the process of distribution of doxycycline, & (3) to evolve the strategy of implementation of chemoprophylaxis in selected villages.

METHODOLOGY

A meeting was convened at district head quarter of Navsari with Chief District Health Officer, Epidemic Medical Officer and Block Health Officers. One village each from two Primary Health Centres (PHCs) was identified, which had reported cases of leptospirosis and deaths in the past 5 years. Pipalgabhan village from Sadakpor PHC and Malvada village from Hond PHC were selected for the study. Doxycycline capsule, 200 mg orally, was administered weekly (every Monday). Two methods used for doxycycline capsule distribution, in Malvada village house to house approach was used while in Pipalgabhan village capsules were distributed through booths.

Group meeting with villagers from 15 to 50 years was conducted and were explained about the doxycycline chemoprophylaxis for control of leptospirosis.

Announcements with mike were carried out in the whole village regarding distribution of doxycycline at booths in Pipalgabhan village. Verbal consent of villagers about the acceptance of the drugs was taken. People were asked to swallow the drugs after lunch (meal) under supervision of the health worker. Monitoring of distribution of capsules was done by enquiring people randomly to assess their status of compliance and records were checked for accuracy of data collection by investigators.

Inclusion criteria include (1) agriculture workers (rice and sugar cane), (2) age 15 to 50 years, and (3) those having animal husbandry. Pregnant women, children below 15 years of age, and patients with jaundice at the time of commencement of chemoprophylaxis with doxycycline were excluded from this study. The study was conducted from July, 2006 to September, 2006. Total nine Mondays were covered during this rainy season for distribution of doxycycline.

Malvada village spread in 1 square kilometer area and having population of 950 scattered in 3 lanes. Target population was identified by Multi Purpose Health Worker (MPHW) of that village. Total 294 people were identified as per the inclusion criteria. Pipalgabhan village spread over four square kilometer area, having population of 4500 scattered in 20 lanes. Total 9 booths were identified for the distribution of doxycycline capsules. 3353 people were identified in Pipalgabhan village for doxycycline chemoprophylaxis.

RESULTS

Drug distribution was started on first Monday of July, 2006 in both Malvada and Pipalgabhan villages. 294 eligible people were identified from Malvada village and 3353 people from Pipalgabhan village. House to house approach like in pulse polio immunization was used for the Malvada village and booth approach was used in Pipalgabhan village for the drug distribution.

{image:1}

In first round of chemoprophylaxis, 287 (97.6%) eligible people were given doxycycline in Malvada village. Out of these, 223 (77.7%) people have taken all nine doses on every Monday starting from first Monday of July, 2006 to the end of September, 2006. Compliance for doxycycline

chemoprophylaxis was very good in this village. By the end of the year 2006, no single case or suspected case of leptospirosis was reported from Malvada village.

{image:2}

In Pipalgabhan village with target population of 3353, only 1402 (41.8%) people have taken doxycycline chemoprophylaxis on first Monday of this study. Out of these 1402 people who have taken first dose of doxycycline chemoprophylaxis, only 441 (31.9%) people have taken all the nine doses of doxycycline. Another finding in these village found was, out of 20 lanes in these village, in 12 lanes people did not taken even single dose of doxycycline for all the nine weeks. Only from 8 lanes people have participated and came forward to booths on each and every Monday for doxycycline.

{image:3}

Not a single case was reported from Malvada village with such a good compliance. In Pipalgabhan village, 3 suspected cases of leptospirosis were reported. In comparison of previous years, no mortality was recorded this year after doxycycline chemoprophylaxis.

DISCUSSION

Two villages reporting cases of leptospirosis since last three years were selected for doxycycline chemoprophylaxis. Since more than one decade, districts of south Gujarat namely, Surat, Navsari and Valsad reporting cases of leptospirosis. As per instructions of Government of Gujarat, Health department, this study was planned with the help of Chief District Health Officer of Navsari and Block Health Officer of the Chikhli taluka from Navsari district.

Among the selected villages two newer approaches for doxycycline distribution were adopted. Malvada village is having small population, so house to house approach was selected, while in Pipalgabhan village because of larger population, booth approach was selected. Now for all the nine doses it was found that in Malvada village patient compliance (77.7%) was very good. It means that people are ready to take medicines if it will reach to their home.

In Pipalgabhan village, patient compliance was not as good as compare to Malvada village. Here in this village, because of large population another approach was used for doxycycline chemoprophylaxis. Because this was the first time such types of approaches were used to evolve the strategy of implementation of doxycycline

chemoprophylaxis in the villages reporting the cases of leptospirosis, no such references were available. The patient compliance is the most important aspect in such study because if we want to control the leptospirosis, it is advisable to take the doxycycline capsule to prevent it. It was proved by many authors (6, 7, 8) in their different studies that doxycycline can be used as chemoprophylactic drug for prevention of leptospirosis.

CONCLUSION

House to house approach is more acceptable than booth approach for doxycycline chemoprophylaxis. Patient compliance was also very good with house to house approach.

References

1. Farr R W. Leptospirosis. Clin infect Dis 1995, 21: 1-8.
2. Farrar W E. *Leptospira* species (Leptospirosis). In: Mandell G L, Bennett J E & Dollin R. Principles and practices of infectious diseases. New York, Churchill Livingstone, 1995. p. 2137-2141.
3. Mackenzie R B, Reiley C G, Alexander A D et al. An outbreak of leptospirosis among U.S Army troops in the Canal Zone. I. Clinical and epidemiological observations. Amer J trop Med Hyg 1966, 15: 57-63.
4. Takafuji E T, Kirkpatrick J W, Miller R N et al. An efficacy trial of doxycycline chemoprophylaxis against leptospirosis. New Engl J Med 1984, 310: 497-500.
5. McClain, J B L, Ballou W R, Harrison S M, Steinway D L. Doxycycline therapy for leptospirosis. Ann Int Med 1984, 100:696-698.
6. Guidugli F, Castro A A, Atallah A N. Antibiotics for prevention of leptospirosis. Cochrane Database Syst Rev 2000, 4: CD001305.
7. Faucher J F, Hoen B, Estavoyer J M. The management of leptospirosis. Expert Opin Pharmacother. 2004, 5 :819-27.
8. Griffith M E, Hospenthal D R, Murray C K. Antimicrobial therapy of leptospirosis. Curr Opin Infect Dis 2006, 19: 533-537.

Author Information

Rajesh K. Chudasama, M.D.

Assistant Professor, Community Medicine, Government Medical College

Naresh Godara, M.D.

Assistant Professor, Community Medicine, Government Medical College

Ratan Srivastava, M.D.

Associate Professor, Community Medicine, Government Medical College

Vikas K. Desai, M.D.

Professor & Head, Community Medicine, Government Medical College