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PREVALENCE OF LEPTOSPIROSIS INFECTIONS AMONG ACUTE FEBRILE PATIENTS IN LAKHIMPUR AND DHEMAJI DISTRICTS

Abstract:

Leptospirosis is a disease condition of infected wild or domestic animals. Humans get this infection when they come in touch with the contaminated soil or water in the infected animal's urine/excreta of animal reservoirs directly or indirectly. Water logging during rainysession, traditional cultivation with animals and water flow to the rivers are the common pictures seen in Assam.which may increase the risk of infection and that is why study area Lakhimpur and Dhemaji districts were choose for our study as both districts are neighboring district of hilly area (Arunachal Pradesh) and found maximum water logging. Blood samples were collected from the acute febrile patients reported to the laboratory for different tests like Typhoid, Japanese Encephalitis (JE), Dengue, Malaria etc. Serums were separated from the whole blood and selected only the JE, Dengue, Malaria, Typhoid negative samples for our study, after the consent from the attendance of the patients. The test results showed that 2.133% (16/750) patients were positive for leptospirosis. Where 12.5% (2/16) positive patients were from Dhemaji district and races were from Lakhimpur. Clinical finding represented Fever 100% (16/16), Headache 68.75 % (11/16), Myalgia 50 % (8/16), Conjunctival Suffusion 6.25 % (1/16), Jaundice 12.5 % (2/16), Cardiac arrhythmia 12.5 %(2/16), Skin rash 6.25 % (1/16), Haemorrhage 6.25 % (1/16), Unconsciousness/semiconciousness12.5 % (2/16), Nausea/Vomiting 6.25 % (1/16), and Abdominal Pain 6.25 % (1/16) in the positive patients. This proves the prevalence of leptospirosis in the study districts of Assamand awareness of disease transmission could minimize the disease risk.

Keywords: Animal, Urine, water logging, Infection.

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Introduction:

Leptospirosis is zoonotic disease represents the symptoms ofacute febrile illness with headache, myalgia and prostration[1]. In addition with these symptoms it may represent conjunctival suffusion, meningeal irritation, Jaundice,Cardiac arrhythmia, Skin rash,haemorrhages (from the intestine / lung etc.),anuria or oliguria etc. Some of the other symptoms like diarrhea,nausea, vomiting, joint pains, abdominal pain etc may also be present in some patients [1,2]. The symptoms could be confirmed as leptospirosis only after laboratory test result. The first case of leptospirosis was reportedby Weil in 1886, who was the Professor of Medicine at Heidelberg [3]. In India different outbreaks of leptospirosis reported from various states time to time are Gujarat, Maharashtra, Kerala, Tamil Nadu, Andaman & Nicobar Islands,Goa, Karnataka, Orissa, Andhra Pradesh etc [4]. From Assam first leptospirosis case was reported in year of 2008 and patient was with pyrexia [5]. This was the 79 years after the Indian first case. The first case of leptospirosis from India reported in 1929 from Andaman Islands[6]. The disease spread to human through animal urine contamination [7]. Because of which cultivators or peoples exposed with infected animals very frequently, are the high risk group of this disease named leptospirosis.Peoples who walk with barefoot are also in high risk. The bacteria infect the human host through mucus membrane, skin abrasions or eye during the contact with the contaminations. Incubation period of this disease is 10-12 days approximately.

Study Area:

Lakhimpur and Dhemaji, the neighboring, border districts of Assam were selected as the study areas for our study. The total population of Lakhimpur district is1,040,644(as per 2011 census) with 2,277 km^2areasand total population of Dhemaji district is686,133 (as per 2011 census) with 3,237km^2 areas. Common communities of both districts are Ahom, Miching, Bodo, Kachari, Brahmin, Muslim, Rabha, Bengali, Kalita, Kayastha etc. as well as both districts are the flood affecting districts of Assam and main income source of both districts are cultivation. Peoples of both districts are lives with domestic animals in their daily life. The rivers of the districts are *Bramhaputra*, *Subansiri*, *Ronganodi*, *Dikrong*, *Jiadhal, Dimow, Moridhal, Gainadi, Korha, Nonoi, Charikaria, Samparasuti* etc. Some of the peoples of both districts use rivers for drinking source, bathing, washing cloth, cleaning of kitchen pots, and sometimes for bathing of domestic animals too. Where peoples takes their animals within the river, which increases the risks of contamination of water.Because of these the study areas were selected for our study.

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Methodology:

Blood samples were collected in plain vials (after consent and labeling) from the acute febrile cases reported to the district hospitals of Lakhimpur and Dhemaji. The labeled samples were allowed to clot for 15-20 minutes and then centrifuged for serum separation. Separated serum (in another screw cap tubes) were labeled and tested for typhoid, JE, malaria and Dengue and negative samples were selected for the Leptospira IgM Microwell serum ELISA tests and stored at -20^{0}C.

Scimedx Leptospira IgM Microwell serum ELISA kits (USA) were used for the study. The kits contained test strips, enzyme conjugate, positive control, negative control, chromogen, RF absorbent, wash concentrate, dilute buffer and stop solution. The positive agreement of the kit was 100% and negative agreement of the kit was 89.7% as per the manufacturer (Scimedx Leptospira, USA). The microwells were coated with purified Leptospirapatoc 1 antigen, and during the addition of serum orduring the time of incubation antigen-antibody binds. Unbound were removed by washing with the help of washing machine (Robonik, Navi Mumbai, India). Binding of antigen-antibody were again bind by enzyme conjugate. These binds turned clear to blue after adding chromogen. Stop solution change the blue colour to bright yellow [Image 1]. The end colours were readed with ELISA reader (Robonik, Navi Mumbai, India) against 450 nm.

Results and Discussion:

The test results showed that out of 750 numbers serum samples 16 samples were positive for leptospirosis by visually as well as ELISA reader which in 2.133 in percentage. Out of these 16 numbers of positive patients 12.5% (2/16) positive patients were from Dhemaji district and others were from Lakhimpur. This proves the prevalence of leptospirosis in the study districts i.e. Lakhimpur and Dhemaji. Again, Clinical diagnosis of patients showed Fever 100% (16/16), Headache 68.75 % (11/16), Myalgia 50 % (8/16), Conjunctival Suffusion 6.25 % (1/16), Jaundice 12.5 % (2/16), Cardiac arrhythmia 12.5 % (2/16), Skin rash 6.25 % (1/16), Haemorrhage 6.25 % (1/16), Unconsciousness/semiconciousness 12.5 % (2/16), Nausea/Vomiting 6.25 % (1/16), and Abdominal Pain 6.25 % (1/16) in the positive patients [Table 1]. This proves the difficulty to diagnose the disease clinically. In the study it was observed that 50 % (8/16) patients were either cultivator or daily worker, who have directly relation with paddy field or domestic animals. 18.75 % (3/16) patients were house wife and having history of touch with domestic animals. 31.25 % (5/16) patients were either service holder, student or unemployed and also having history of either touch with domestic animals or bathing in river. All the patients having history of walking barefoot. Awareness about the disease transmission could minimize the disease risk as it was found that patients

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were unaware about the disease. As the disease showed prevalence, treating physician must advice for the leptospirosis test to avoid missed diagnosis for treatment of the acute febrile cases in addition with other tests if the patient having history of exposure. Veterinary department may also play an important role to control the disease or minimize the transmission like vaccination of animals, as the peoples of Assam's having socioeconomic relation, cultural relation etc with animals directly.

Table:

Clinical findings	Patients reported (in %)
Fever	100
Headache	68.75
Myalgia	50
Conjunctival suffusion	6.25
Jaundice	12.5
Cardiac arrhythmia	12.5
Skin rash	6.25
Haemorrhages (from the intestine / lung etc.)	6.25
Unconsciousness/Semiconscious	12.5
Nausea/ vomiting	6.25
Abdominal pain	6.25

Table 1: Symptoms reported by the positive patients

Image:

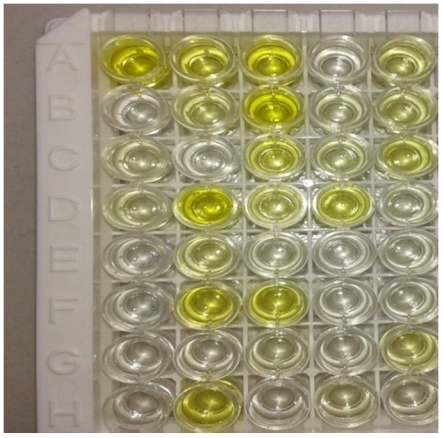

Image 1: Visual ELISA results

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