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Treatment of dual infection of Leptospirosis and Enteric fever

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Abstract

Leptospirosis, a zoonotic disease, is a major public health problem to human. The disease has become more common in the southern part of India, especialy after the monsoons. Though the diagnosis of this disease needs a high degree of accuracy, it is curable by prompt medication. But the condition becomes highly complicated when it presents as a dual infection with another pathogen. This paper describes the treatment of dual infection of *Leptosipra* and *Salmonella typhi* studied at Rajah Muthiah Medical College and Hospital, Chidambaram, Tamilnadu, India. All the 27 detected patients with dual infection were cured completely after being treated for both diseases.

Keywords: dual Infection, enteric fever, Leptospirosis, *Salmonella*, zoonoses

INTRODUCTION

Leptospirosis is a zoonotic disease (Adler *et al.,* 1980, Angunni *et al.,* 2002) caused by the delicate spirochaete *Leptospira interrogans*. The disease has become a major public health problem due to the sudden upsurge in the number of reported cases and several outbreaks. It is an occupational hazard (Brandao *et al.,* 1998; Chandrasekaran and Gomathi, 2004) among agricultural workers, sewage handlers and vertenarians who are in the risk of coming in to contact with *Leptospira* excreted in the urine of animal carriers (rats) (Romero *et al.,* 1998). This disease is reported to be more common in tropical areas with heavy rainfall (Leveth, 2001; Reyes and Pena, 2001 and Nizamudeen *et al.*, 2006). The incidence of the disease is more among rural population (Sambasiva *et al.,* 2003) or among individuals in the low socio-economic group with poor standards of hygiene (Sumathy *et al.,* 1995; Rele *et al.,* 2001). The clinical features of Leptospirosis varies from a mild anicteric illness characterized by fever, myalgia, conjunctival suffusion, to a severe illness with jaundice, renal failure, bleeding diathesis, meningitis and myocarditis which may be fatal.

Enteric fever is a bacterial disease transmitted by the oro-faecal route. It is characterized by step ladder pyrexia, bradycardia, hepatomegaly and splenomegaly. The disease has gained importance due to its course and dreaded complications like intestinal perforation, haemorrhage and septicemia.

This study describes the treatment of dual infection due to *Leptospira interrogans* and *Salmonella typhi* which leads to a very confusing clinical picture where in the patient suffering from high grade fever is not responding to the usual treatment modalities.

MATERIALS AND METHODS

The study was conducted on patients who attended the out-patient department of Rajah Muthiah Medical College Hospital, (RMMCH OPD), Chidambaram, Tamil Nadu, India between October and December 2008 with pyrexia of unknown origin. Detailed case histories were taken of the patients by subjecting them to the routine laboratory investigations such as complete haemogram, urine analysis, determination of S. bilirubin, blood urea and blood sugar, LFT, blood culture, Widal test, ECG, Chest X-ray, abdominal USG, Dark field microscopy, ELISA test to confirm the presence of IgG and IgM antibodies against *Leptospira*, Urine culture and sputum examination for AFB.

RESULTS AND DISCUSSION

A total of 310 patients were taken up for the study in a period of three Months (October to December 2008) .In our study, the age group of the patient population varied from 10 years to 70 years and included both males and females.

All these patients came to the OPD with Pyrexia of Unknown Origin (PUO) with complaints of fever for more than 1 week duration and not responding to antipyretics like T.Paracetamol. Detailed case histories were taken and after through clinical examinations the patients were classified into three groups based on their symptoms.

Group I – Suspected Enteric fever:

Patients with fever, coated tongue, myalgia, head ache.

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Group II – Suspected Leptospirosis:
Patients with fever, myalgia, conjunctival suffusion.

Group III – Pyrexia of Unknown Origin (PUO)

Out of the total 310 patients 108 patients belonged to Group I, with 82 were positive for widal showing titres of > 200 for O antigen and H antigen. But blood culture showed growth of *Salmonella typhi* only in 46 patients.

Group II had 97 patients with suspected Leptospirosis. Dark Field Microscopy revealed *Leptospira interrogans* in 52 patients; but ELISA picked out more positives and detected 66 patients with Leptospirosis.

Group III had 105 patients and they were investigated thoroughly having in mind all possible causes of PUO. Fifty one patients showed growth in urine culture and were proved to have Urinary Tract Infection. In 29 cases the fever was found to be due to Tuberculosis as they showed AFB in sputum. Six were positive for malaria. Viral fever was diagnosed in 31 patients. Other causes like brucellosis, HIV & Post-operative wound infection was detected in eight patients.

Leptospirosis is a zoonotic disease. Rats are mainly involved in its transmission. Leptospires are excreted in the urine of the animal carrier thereby contaminating the environment. Persons exposed to this contaminated environment contract the disease as the leptospires enter the human body through cuts or abrasions in the skin. The disease is very common in the post monsoon period after floods as the stagnant water becomes polluted with the animal carrier's urine and leads to an outburst of the disease. This was evident in our study also, which was conducted after the heavy rainy season and the resulting floods which occurred between October and December 2008, in the present study area.

Study of the male:female ratio of the patients showed that more numbers of males were affected which can be attributed to their life style and occupation. The patients attending the RMMCH OPD were mainly from villages around Chidambram and the incidence was more in the low socio –economic group as transmission was more under poor conditions of hygiene.

Dark field Microscopy (DFM) and serological test for ELISA, IgG and IgM were done for all cases suspected to have leptospirosis. DFM was able to pick out less number of positives than ELISA. Since DFM needs a lot of expertise for interpretation, it is not considered as a confirmatory test and ELISA was done to confirm the infection. ELISA IgG & IgM for leptospiral antibodies was done on all 3 groups of the patient population.

The serum samples which turned positive by ELISA were further sent to Madras Medical College, Chennai for MAT test for confirmation of our results. Positive results were obtained with significant titre of 1:80 and above. The serovars were identified to be *Leptospira interrogans* serovar *icterohaemorrhagiae*, *Leptospira interrogans* serovar *australis* and *Leptospira interrogans* serovar *cannicola*.

Those cases positive for *Leptospira interrogans* (66) alone were treated with sixth hourly Penicillin given intravenously. Twenty six patients responded very well to this and recovered completely. Forty patients in the Leptospira positive group, were treated with Ing. Amlpicillin and Clavulanic acid as they could not tolerate Penicillin. These patients became afebrile in due course and recovered completely.

Those patients who had enteric fever(82) alone were treated with Cap. Ofloxacin 400mg once daily or Cap. Ceftum 500mg twice daily. Intravenous fluid therapy was given whereever needed. These patients also recovered completely in a weeks time.

The patients in Group III who were diagnosed to have UTI/ post operative infection were treated with appropriate antibiotics after doing an antibiogram. Antimalarial therapy was started for those patients who were positive for malarial parasite. The 31 patients

Table 1. Categorization of Patient Groups of the present study

Patient Group	Total No. of Patients	*Salmonella typhi*		Leptospira			Inter pretation
		Widal +ve	Blood Culture +ve	DFM +ve	ELISA +ve		
					IgG	IgM	
Suspected Enteric Fever	108	82	46	--	--	--	Enteric Fever
Suspected Leptospirosis	97	-	-	52	66	63	Leptospirosis
Pyrexia of Unknown Origin (PUO)	105	27	16	21	27	25	Dual Infection

diagnosed to have viral fever, were treated symptomatically. Anti-Tuberculosis therapy was started for those patients positive for Acid Fast Bacilli. All the patients responded well and became afebrile after treatment.

The 27 cases, who were detected to have Dual infection (Typhoid and Leptospirosis) were treated for both infections. All the patients in this group were positive for the Widal test though blood culture showed the growth of *S.typhi* in very few cases. They had significant antibody titres of > 1:200 for STO and >1:400 for STH. These patients were treated with C. Oflin 400mg / T.Ceftum 500mg twice daily for a week. The patients did not respond and came back to the OPD with temperatures of 102 ° to 103 ° F. They were subjected to Leptospira serology. As they proved to be positive for IgG and IgM antibodies they were treated with IV Penicillin or Inj. Ampicillin + Clavulanic acid to which they responded very well and became afebrile. All these 27 patients recovered completely.

If dual infection had not been suspected, the outcome of these patients would have been adverse. PUO cases are

Table 2. Results of various treatments on the patient groups of the present study and the outcomes

Disease	Treatment	Outcome
Enteric fever	C.Oflin or T.Ceftum	Responded
Leptospirosis	Inj. Penicillin or Inj.Ampicillin + Clavulanic acid	Responded
Dual Infection	C.Oflin or T.Ceftum & Inj. Penicillin or Inj.Ampicillin + Clavulanic acid	Responded

screened for *Leptospira* or *Typhoid bacilli* but rarely are both these looked for. Dual infection of Leptospira with a number of viral diseases like Hepatitis, Dengue and HIV are documented. We were able to detect dual infection of Leptospira with Typhoid fever also in Chidambaram.

CONCLUSION

Results of the present study confirmed that in cases of PUO refractory to treatment, dual infection of Leptospirosis and Enteric fever should always be looked for.

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