

### **Use of Ciprofloxacin and its Resistance in Typhoid Fever**

Widespread occurrence of multidrug resistant typhoid fever has been reported from many centres in India and abroad. Rapidly evolving drug resistance of *S. typhi* to conventionally used antimicrobials (chloramphenicol, ampicillin, amoxicillin and cotrimoxazole) has been reported frequently. Quinolones like ciprofloxacin and p-floxacin which have been used in adult typhoid are now, increasingly being used in drug resistant typhoid in children. Resistance to ciprofloxacin may develop after prolonged oral use, in the colonising flora while treating Gram negative septicemias either during therapy or after therapy(1). Here we report 6 cases of ciprofloxacin resistant typhoid fever treated in our department during the past 3 years.

The number of enteric fever patients admitted during 1990, 1991 and 1992 were 60, 147 and 152, respectively. The number of *S. typhi* isolated tested for ciprofloxacin sensitivity were 11 (1990), 105 (1991) and 74 (1992). Each year two isolates were found to be resistant to ciprofloxacin *in vitro* (total 6 cases). All these 6 cases presented with fever, cough and hepatosplenomegaly except one which had associated encephalo-

pathy and later visual hallucinations. *S. typhi* resistant to ciprofloxacin alone was isolated in one case while in all the other 5 cases the organism showed *in vitro* resistance to 2 to 4 other commonly used antimicrobials. Three of these cases were treated with cotrimoxazole and one case each was treated with ampicillin, chloramphenicol and furazolidone. *S. typhi* showing *in vitro* resistance to ampicillin and chloramphenicol had been isolated in the 2 cases which showed clinical improvement with these drugs. All these 6 cases took a minimum of 6 to 9 days to become afebrile after starting therapy.

The number of typhoid cases which received ciprofloxacin were 3, 30 and 84 in 1990, 1991 and 1992, respectively. The average time taken for defervescence was  $3.7 \pm 1.52$  (range 2-5 days),  $6.5 \pm 2.86$  (range 2-16 days) and  $6.1 \pm 2.32$  (range 1-13 days) in the years 1990, 1991 and 1992, respectively. All the cases recovered completely. Sixty five per cent (76/117) took about 4-7 days and 23% (27/117) more than 7 days to become afebrile after starting ciprofloxacin. Of these 5 had a defervescence period of more than 10 days. Those patients who took a longer time to become afebrile had associated complications (Table I). Of the 117 cases receiving ciprofloxacin, in 86 cases it was started after failure of other drugs like ampicillin, chloramphenicol, cotrimoxazole and furazolidone. In 31 cases (26.5%) the drug was started on the day of admission because of associated complications, viz., myocarditis, encephalopathy, peripheral circulatory failure, gas\* trointestinal bleeding and meningitis.

In spite of apprehension regarding damage to growing cartilage by use of fluoroqui-

**TABLE I**—*Number of Cases who took Longer Period for Defervescence and the Associated Complications*

Case number	Time taken for defervescence day	Associated complications
1	11	Gastrointestinal bleeding, hepatitis, cholecystitis and encephalopathy
2	16	Hepatitis and meningitis
3	13	Gastrointestinal bleeding and myocarditis
4	12	Myocarditis, peripheral circulatory failure and encephalopathy
5	11	Gastrointestinal bleeding and encephalopathy

nolones in adolescent animal models, long term studies in human beings do not favor this hypothesis(1,2). Besides this, only 6 cases of *S. typhi* showing *in vitro* resistance to ciproflox were isolated in three years in

a tertiary centre like ours where the drug is being used to treat life threatening Gram negative sepsis and multidrug resistant enteric fever. Hence, ciprofloxacin may be used in the treatment of life threatening complications of typhoid fever without apprehension regarding the quick development of drug resistance.

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## Venous Thrombosis in Enteric Fever

Enteric fever still continues to be rampant in our country. Despite the availability of effective antimicrobials it is still associated with a fairly high incidence of serious complications. Venous thrombosis was a common complication before the antibiotic era and often occurred in the fourth week of illness(1). After introduction of effective antimicrobials, thrombosis and phlebitis occur

rarely(2). We report here a case of enteric fever with venous thrombosis because of its rarity and its association with shock, acute renal failure, and localized abscess.

A 9-year-old girl was admitted with continuous high grade fever and pain abdomen for seven days. Fever was accompanied by chills and rigors. She had also oliguria, swelling and pain over right lower limb for last four days prior to admission. Physical examination revealed a stuporous, toxic child with moderate anemia, imperceptible peripheral pulses, cold extremities. Her systolic