e-ISSN : 2455-5258

Research in Pharmacy and Health Sciences

Case Reports

Multiple Drug Resistance in Typhoid Fever: A Case Report

Sabeeha Kausar

Faculty of Pharmacy, University of Sargodha, Sargodha, Pakistan

ABSTRACT

A 20-years-old girl was examined in hospital premises having the symptoms like fever, abdominal cramps, diarrhea and fatigue since last week. Palpation revealed discomfort in left upper and lower abdomen. Ultrasonography revealed hepatomegaly and increased spleen size. Hematological tests revealed anemia and typhidot test was positive for IgG. The Widal test showed that patient serum was agglutinated with lipolysacharide and flagellarproteins. The antigen of serotype S.typhi was also present. Patient was diagnosed with typhoid fever. First-line therapy was penicillin that remained uneffective. Second line therapy given was quinolones; that also remained uneffective. Antibiotic susceptibility test showed that strains were resistant to multiple drugs like chloramphenicol, ciprofloxacin and co-trimoxazole. Finally, rational therapy was third generation cephalosporin i.e. ceftriaxone. After one-week of therapy, patient physical symptoms disappear and no relapse occurred during follow up.

Received: 2-02- 2015

Revised: 29-02-2015

Accepted: 01-04-2016

***Correspondence to:**
Dr. Sabeeha Kausar
Email:
sabeehakausar86@gmail.com

Funding: Nil
Competing Interests: Nil

Keywords: *Salmonella typhi, multiple drug resistance, Widal test, rational antibiotic therapy*

INTRODUCTION:

Typhoid fever or enteric fever is a serious health problem worldwide due to poor hygienic and sanitary conditions. According to recent estimate of World Health Organization, 21 million cases are observed annually all over the world and 80% of these are encountered in Asia. Annually 600,000 deaths occur on behalf of this disease. In western countries, this disease is near about to eradication[1] Typhoid fever is caused by facultative gram +ve bacteria, salmonella typhi through oral fecal route and reside only with in human colon. After ingestion of this organism, it invade the small intestine and enter the blood stream and carried to the liver, spleen and bone marrow by white blood cells where it multiplies and re-enter the blood stream. It may invade the gall bladder, biliary system and lymphatic tissues where it multiply in high number. The chronic carrier state occurs in gall bladder. The capsule (Vi antigen) is the virulence factor and endotoxins in the cell wall causes fever[2]. The incubation period for this organism is 1-2 weeks and duration of illness is 3-4 weeks approximately. 3-5% people become carrier after acute illness. The symptoms for typhoid fever may include poor appetite, headache, generalized pain, fever (>104^0 F), diarrhea and abdominal pain[3]. The serological tests such as Typhoid and Grubber-Widal test are suggested as rapid diagnostic technique as compared to blood cultures. Prior to antibiotic treatment fatality rate is 20% and after antibiotic treatment it decreases to 1-2%.The first line therapy for typhoid that is recommended by FDA is by Ampicillin/Amoxicillin(500 mg q.i.d for 14 days) or chloramphenicol(1000-2000mg q.i.d for 14 days). And second line therapy is by ciprofloxacin(500mg b.i.d for 10-14 days) or ceftriaxone (1-2g b.i.d for 7-10 days). If rational therapy is started, patient improvement start within 1-2 days and recover after 7 days. Three types of vaccines are available for typhoid fever i.e. phenol inactivated vaccines, oral live attenuated typhi 21a and injectable unconjugated Vi typhoid vaccines [4].

CASE REPORT

A lean 20-year-old girl was examined in hospital premises with intermittent high grade fever (>104^0F) since one week with co-existing nausea, vomiting, fatigue, abdominal cramps and diarrhea. Her medical history record revealed that she had suffered from typhoid fever last year and physical appearance show her poor health. The palpation revealed discomfort in left upper and lower abdominal quadrant. Ultra sonogram reveal hepatomegaly (12cm) and spleen size was increased to 9cm. There was no other abnormalities i.e. gall bladder, bile duct, pancreas and kidney were found normal. She was referred for typhoid test, Widal test (positive), blood complete picture and urine analysis. Blood C.P show anemia (Hb 9mg/dL) and slightly elevated lymphocyte level (53.4%). Typhoid test was positive for IgG. Urine analysis show occasional RBCs, pus cell (3-4), epithelial cell (2-3), no bile salts or pigments and bacterial cells. Widal test reveals that patient serum was agglutinated with lipopolysaccharide TO (1:200) andflagellarTh (1:100) and antigen of serotype S.typhiwere also found. Blood culture revealed that no antimicrobial therapy was administered in previous seven days. After test reports, first line antimicrobial therapy against S. typhi was started that was chloramphenicol (500 mg q.i.d for seven days). Paracetamol after every four hours till the temperature lower to 100^0F. Pantoprazole (20mg od for seven days), metoclopramide (10mg t.i.d for seven days) and metronidazole (200mg t.i.d for seven days) were prescribed to reduce other symptoms. After a week patient again visited physician with no significant improvements. Test reports reveal that s. typhi has grown in blood culture. According to Widal test, titer of antibodies was same as

before the starting of antimicrobial therapy. Physician prescribed ciprofloxacin (500mg b.i.d for seven days) and pantoprazole, metoclopramide and metronidazole in same doses as before. After seven days patient did not show significant improvements. When antibiotic susceptibility testing of isolated strains was carried out, strains show multidrug resistance to ampicillins, chloramphenicol and co-trimoxazole. Physician prescribed third generation cephalosporin, ceftriaxone (intravenously 1g b.i.d for seven days) along pantoprazole, metoclopramide and metronidazole in same doses as previous. After one week patient show significant improvements physically and Widal test revealed improvements in antibodies titer (TO 1:800 and TH 1:200). Blood culture revealed complete eradication of the organism. The same therapy was carried out for further seven days. After seven days, physical symptoms disappear and no relapse occur during follow up.

DISCUSSION

Typhoid fever or enteric fever is systemic bacterial infection caused by salmonella typhi having more than twenty different serotypes[5]. Because of this versatility in serotype this organism is becoming resistant to many present day antimicrobial agents. Especially emergence of multiple drug resistant(MDR) strains among salmonella is rising problem in treatment of this infectious disease. Another type of resistant strains is nalidixic acid resistant salmonella typhi (NARST). These resistances may occur by chromosomal mutations or plasmid encoded resistance strains [6]. Multidrug resistant typhoid fever is emerging health problem specially, in developing countries like Asia with 5-20% mortality rate[7]. Symptoms for typhoid fever include fever, abdominal discomfort, abdominal cramps, diarrhea, vomiting, nausea, fatigue and similar symptoms are mentioned in tatli et al [8].Due to emergence of resistant strains, it is possible to prescribe rational therapy for typhoid fever after testing the antibiotic susceptibility of isolated strains. Most of the strains are resistant to antibiotics like penicillin, chloramphenicol, and earlier generation cephalosporin and flouroquinolones. Ciprofloxacin remains no more drug of choice in empirical therapy for treatment of typhoid fever unless the isolated strains show complete susceptibility to this agent[9]. Rational therapy that remain effective in most clinical cases is by third generation cephalosporin (ceftriaxone and ofloxacin) [10]. The WHO recommends ciprofloxacin, ofloxacin and azithromycin for treatment of multiple drug resistant cases [11] and higher doses of older flouroquinolones for nalidixic acid resistant cases[12] Resistance to azithromycin and ceftriaxone is found in rare cases and they are recommended for empirical therapy for resistant cases[13] .

CONCLUSION

Multiple drug resistance is an increasing problem in treatment of typhoid fever. Third generation cephalosporin specially ceftriaxone is well tolerated but is expensive. Ofloxacin is therapeutic alternative for ceftriaxone that is relatively cost effective. Rational therapy of antibiotics is necessary for significant improvements and complete eradication of the organism. The choice of drug and duration of therapy depends on clinical severity of infection, available resources, antibiotic resistance as well as physician experience in relevant disease.

REFERENCES

1. World Health Organization. Available at: http//www.WHO.com>immunization, vaccines and biological vaccines and diseases>typhoid.
2. Warren. E. Levinson. Lange review of medicall microbiology and immunology. 12 edition(2012). mcGraw Hill Companies.
3. JA Crump, S. L. The Global Burden Of Typhoid Fever. Bull world health organ. 2000; 346-53.
4. F.Y Lin, V. H. (2001). The Efficacy Of Salmonella Typhi Vi Conjugate Vaccine In 2-5 Year Old Children. N Eng J med 2001;344.
5. Ahmad A, Khan MU, Patel I, Maharaj S, Pandey S, Dhingra S. Knowledge, attitude and practice of B. Sc. Pharmacy students about antibiotics in Trinidad and Tobago. J Res Pharm Pract. 2015;4(1):37.
6. Miller SI, P. D.Priciples and practices of infectious diseases (5 ed.).(2000). (R. D. Mandel GL, Ed.) churchil levingstone.
7. Parry CM, H. T. Typhoid fever. N Engl J Med. 2000;1770-1782.
8. Dhingra S, Nagavi BG. Trial implementation and assessing the impact of standard therapeutic guidelines among general practitioners of Mysore City. Ind J Hosp Pharm. 2006;3(1) 31-34.
9. Rehman, M. Treatment of enteric fever. ORION M J,(2009) 674.
10. Acharya G, B. T. Treatment of typhoid fever: randomized trial of a 3 day course of ceftriaxone versus a 14 day course of chloramphenicol. J Trop Med Hyg,(2000) 162-165.
11. TX Cao, R. K. A Comparative Study Of Ofloxacin And Cefixime For Treatment Of Typhoid Fever In Children. Pediatr Infect Dis J,(1999) 245-248.
12. SK Sha, S. T. A Highly Ceftriaxone Resistant Salmonella Typhi In Bangladesh. Padiatr Infect Dis J,(1999) 387.
13. Dhingra S, Parle M. Rational Drug Use and Pharmacist. Ind J Hosp Pharm 2005;3(1);31-34.

Cite this article as: Kausar S. Multiple Drug Resistance in Typhoid Fever: A Case Report . Res Pharm Healt Sci. 2016;2(2):96-97.