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Typhoid fever clinical presentation pattern and antimicrobial sensitivity in paediatric patients coming to tertiary care Hospital Peshawar

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Abstract--Objective: to investigate the clinical features and antimicrobial sensitivity of typhoid fever in children. Study Design: A cross-sectional study. Place and duration of study: the study was carried out at the medical teaching institute lady reading hospital peshawar's paediatrics department. Material and Methods: this research included 384 children aged 2 to 15 who had a fever of 38 degrees celsius or higher. Clinical signs and symptoms, as well as laboratory testing, were used to assess all patients for typhoid fever. Blood culture, sensitivity, complete blood count, functional liver test, and urine examination were all performed. The frequencies and percentages for qualitative variables were computed and tabulated using SPSS, whereas the mean and standard deviation for quantitative variables were calculated and tabulated. Results: 384 patients had a mean age of 7.48 years, a mean duration of 16.9 days, a mean serum hemoglobin(Hb) level of 9.9 g, a mean leukocyte count of 8.45x10⁹/L, and a mean platelet count of 245.13x10³/Ul. 50.8% (195) of patients were urban, 49.2% rural. 86 (22.4%) patients had a cough, 36.2 % (139) had diarrhoea, 108 (28.1%) were constipated, 153 patients had complained of vomiting, 37% had anorexia, abdominal

pain was found in 36.7% (141) patients, lymphadenopathy was present in 140 (36.5%) patients, jaundice was noted in 141 (36.7%) patients, the 37% patients tongue was coated, and hepatomegaly was present in 36 36.7% (141) had splenomegaly, 33.1% thrombocytopenia. 40.6% (156) had anaemia, 9.6% (37) had utis, 8.3% (32) had hepatitis, and 0.3% (1) had vivax malaria. 257 (66.9%) people had positive typhidot tests, while 201 (52%) had positive blood cultures. Ceftriaxone, ampicillin, amoxicillin, cotrimoxazole, cefixime, co-amoxiclav, and cephalixin were sensitive in 0.5% of cases in 1.5% (3) instances, ciprofloxacin was effective. 98.5% were resistant to chloramphenicol, 100% to meropenem and imipenem, and 99% to azithromycin. Conclusion: Salmonella typhi identified by blood culture was mostly resistant to first- and second-line antibiotics, necessitating antibiotic sensitivity and resistance testing for the sensible use of antibiotics for enteric fever.

Keywords---Enteric Fever, Children, Typhidot, Blood Culture.

Introduction

Typhoid Fever Is An Infectious Disease Caused By The Salmonella Enterica Serotype Typhi¹. Which Is Spread Mainly Through Water Or Food Contaminated With Human Feces². Other Salmonella Enterica Species, Like Serovar Paratyphi And Non-Typhoidal Serovars, Cause Paratyphoid Fever And Invasive Non- Typhoidal Salmonellosis, Respectively³. Clinical Presentation Of Typhoid Fever Varies From Mild Illness With Low-Grade Fever, Malaise, Anorexia, Nausea, Vomiting, Diarrhea/Constipation, And Dry Cough To A Severe Clinical Presentation Like High-Grade Fever, Abdominal Pain, Unconsciousness, And Many Complications⁴. Coated Tongue, Splenomegaly, Hepatomegaly, Relative Bradycardia, Skin Rash, And Toxemia Are Common Signs⁵. Blood Culture Remains The Gold Standard For Diagnosing Typhoid, But The Disease Is Often Missed Due To Low Sensitivity (40%-75%). In The Past, Many Rapid Diagnostic Tests (Rdts) And Prototypes Like Widal, Typhidot, Typhidot-M, And Other Tests Have Been Available.

The World Health Organization (WHO) Estimates The Global Typhoid Fever Burden At 11–20 Million Cases Annually⁶. Worldwide Mortality Has Been Estimated Up To 10-30%, Which Can Be Reduced By 1- 4% With Proper Management⁷. According To Antillón Et Al· The Estimated Burden Of Typhoid Fever In Sub-Saharan Africa Is 762 Cases Per 100,000 People Per Year. In Southeast Asia, East Asia, And Oceania, An Estimated 108 Cases Of Typhoid Fever Per 100,000 People Are Reported Yearly⁸. Pakistan Was Estimated To Have The Highest Typhoid Fever Among South Asian Countries, With 493.5 Cases Per 100,000 Population In 2018. The Number Of Cases In Pakistan Increased Dramatically After The Outbreak Of A New Extensive Drug-Resistant (XDR) Strain Of Typhoid In Hyderabad In 2016, Mainly Affecting The Province Of Sindh. This

New Typhoid Type Rendered The Treatment With Chloramphenicol, Ampicillin, Co-Trimoxazole, Fluoroquinolones, And Cephalosporins Third-Generation Ineffective And Ultimately Requires Treatment With Potent Antimicrobials Like Carbapenems, Tigecycline, And Azithromycin⁹.

After A Thorough Literature Search, No Such Study Has Been Conducted In The Area The Title Mentioned Above. So The Current Study Aims To Determine A Clear Picture Of The Clinical Presentation Of Typhoid Fever And Antimicrobial Sensitivity. The Current Research Will Explain The Use Of Proper Antimicrobials And Will Be Helpful In The Management Of Typhoid Fever In The Pediatric Population. And Will Help To Contribute To The Existing Literature By Covering The Identified Research Gap¹⁰.

Material and Methods

The Study Was Conducted At The Pediatrics Department Of The Medical Teaching Institute Lady Reading Hospital Peshawar From *The Total Patient In This Study Was 384 Children* Between 2-16 Years Of Age With Fever.

All Patients Were Evaluated For Typhoid Fever By Clinical Signs & Symptoms And Laboratory Investigation. Typhidot Test, Blood Culture, Sensitivity, Complete Blood Count, Functional Liver Test, And Urine Examination Were Done. Children With A Febrile Illness Diagnosed With Other Causes, E.G., Malaria, Pneumonia, Acute Viral Hepatitis, Meningitis, Dengue Fever, Urinary Tract Infection (UTI), And Children With Known Malignancies, Were Excluded From The Study.

Data Analysis

The Data Was Processed And Tabulated Using Spss V. 22. The Quantitative Data Were Reported As Mean And Standard Deviation, Whereas The Qualitative Variables Were Expressed As Frequencies And Percentages.

Table 01: Descriptive Statistics of the patients

Descriptive Statistics			
	N	Mean	Std. Deviation
Age In Year	384	7.48	3.512
Duration Of Fever In Days	384	16.89	6.592
Hb In Gram	384	9.89	1.894
TLC In $10^9/L$	384	8.45	3.351
PLT In $10^3/UL$	384	245.13	176.885

This Table Shows That There Were 384 Patients, Whose Mean Age Was 7.48 Years With 3.5 SD, The Mean Duration Of Fever Was 16.9 Days With SD Of 6.6, The Mean Serum Hemoglobin (Hb) Level Was 9.9 Grams With 1.9 SD, The Mean Leukocyte Count Was $8.45 \times 10^9/L$ With SD Of 3.35, The Mean Platelet Count Was $245.13 \times 10^3/UL$ With SD Of 176.88.

Table 02: Clinical Presentation Of Typhoid Fever

		Frequency	Percent
Gender Of ThePatient	Male	245	63.8
	Female	139	36.2
	Total	384	100.0
Address Of ThePatient	Urban	195	50.8
	Rural	189	49.2
	Total	384	100.0
Cough	Yes	86	22.4
	No	298	77.6
	Total	384	100.0
Diarrhea	Yes	139	36.2
	No	245	63.8
	Total	384	100.0
Constipation	Yes	108	28.1
	No	276	71.9
	Total	384	100.0
Vomiting	Yes	153	39.8
	No	231	60.2
	Total	384	100.0
Anorexia	Yes	142	37.0
	No	242	63.0
	Total	384	100.0
Abdominal Pain	Yes	141	36.7
	No	243	63.3
	Total	384	100.0
Lymphadenopathy	Yes	140	36.5
	No	244	63.5
	Total	384	100.0
Coated	Yes	142	37.0
	No	242	63.0
	Total	384	100.0
Jaundice	Yes	141	36.7
	No	243	63.3
	Total	384	100.0
Hepatomegaly	Yes	139	36.2
	No	245	63.8
	Total	384	100.0
Splenomegaly	Yes	141	36.7
	No	243	63.3
	Total	384	100.0
Thrombocytopenia	Yes	127	33.1
	No	257	66.9
	Total	384	100.0
Pus Cell(UTI)	Yes	37	9.6
	No	347	90.4
	Total	384	100.0

Raised SGPT(Hepatitis)	Yes	32	8.3
	No	352	91.7
	Total	384	100.0
Anemia	Yes	156	40.6
	No	228	59.4
	Total	384	100
Typhidot	Yes	257	66.9
	No	127	33.1
	Total	384	100
Blood Culture	Yes	201	52.3
	No	183	47.7
	Total	384	100
Malaria	Positive	01	0.3
	Negative	383	99.7
	Total	384	100

The Total Patient In This Study Was 384; Male Patient Was 245 (63.8%), While The Remaining 139 (36.2%) Were Female. 50.8% (195) Of Patients Were From Urban Areas, While 189(49.2%) Were From Rural Areas.86 (22.4%) Patients Had A History Of Cough, 36.2 %(139) Of Patients Suffered From Diarrhea, 108(28.1%) Patients Were Constipated, 153 Patients Had Complained Of Vomiting, 37% Patients Had Anorexia, Abdominal Pain Was Found In36.7%(141) Patients, Lymphadenopathy Were Present In 140(36.5) Patients, Jaundice Noted In 141 (36.7%) Patients, The 37% Patients Tongue Was Coated, Hepatomegaly Was Present In 36.2% Patients. In Comparison, Splenomegaly Was Found In 36.7% (141) Patients; There Was Thrombocytopenia In 127 (33.1%) Patients. At The Same Time, Anemia Was Present In 40.6%(156) Patients, 37(9.6%) Patients Had Urinary Tract Infections, 8.3%(32)Patients Were Diagnosed With Hepatitis, And Only One Patient (0.3%) MP Test Was Positive For Vivax. The Typhidot Test Was Positive In 257 (66.9%) Patients, While The Blood Culture Was Positive In 201 (52.3%).

Table 03: Blood Culture and Sensitivity

		Frequency	Percent
Ceftriaxone	Sensitive	01	0.5
	Resistant	200	99.5
	Total	201	100
Amoxicillin	Sensitive	01	0.5
	Resistant	200	99.5
	Total	201	100
Ciprofloxacin	Sensitive	03	1.5
	Resistant	198	98.5
	Total	201	100
Cotrimexazole	Sensitive	01	.5
	Resistant	200	99.5
	Total	201	100
Chloramphenicol	Sensitive	02	01
	Resistant	199	99

	Total	201	100
Cephalexin	Sensitive	01	0.5
	Resistant	200	99.5
	Total	201	100
Coamoxiclave	Sensitive	01	0.5
	Resistant	200	99.5
	Total	201	100
Cefixime	Sensitive	01	0.5
	Resistant	200	99.5
	Total	201	100
Ampicillin	Sensitive	01	0.5
	Resistant	200	99.5
	Total	201	100
Azithromycin	Sensitive	199	99
	Resistant	02	01
	Total	201	100
Imipenem	Sensitive	201	100
	Resistant	0	0
	Total	201	100
Meropenem	Sensitive	201	100
	Resistant	0	0
	Total	201	100.0

201 out of 384 patient blood cultures showed growth of salmonella typhi; 1 (0.5%) blood culture out of these was sensitive to ceftriaxone, ampicillin, amoxicillin, cotrimoxazole, cefixime, co-amoxiclav, and cephalexin while the remaining 99.5%(200) found resistance to these medicines, in 1.5% (3) cases the blood culture was sensitive to ciprofloxacin. In contrast, 98.5% was resistant, the sensitivity of chloramphenicol was 1%, the meropenem and imipenem were 100% sensitive, while the azithromycin sensitivity was 99%.

Results

384 individuals with a mean age of 7.48 years, a standard deviation of 3.5, a mean duration of fever of 16.9 days, a mean serum Hemoglobin (Hb) level of 9.9 grammes, a mean leukocyte count of $8.45 \times 10^9/L$, and a mean platelet count of $245.13 \times 10^3/ul$ were investigated. 245 (63.8%) of 384 study patients were men, 139 (36.2%) were women. Patients were urban 50.8% (195) and rural 49.2%. 86 (22.4%) patients had a cough, 36.2 % (139) had diarrhoea, 108 (28.1%) were constipated, 153 patients had complained of vomiting, 37% had anorexia, abdominal pain was found in 36.7%(141) patients, lymphadenopathy was present in 140(36.5%) patients, jaundice was noted in 141 (36.7%) patients, the 37% patients tongue was coated, and hepatomegaly was present in 36 36.7% (141) had splenomegaly, 33.1% thrombocytopenia. 40.6%(156) had anaemia, 9.6%(37) had UTIs, 8.3%(32) had hepatitis, and 0.3%(1) had vivax malaria. 257 (66.9%) people had positive Typhidot tests, while 201 (52%) had positive blood cultures. Ceftriaxone, ampicillin, amoxicillin, cotrimoxazole, cefixime, co-amoxiclav, and cephalexin were sensitive in 0.5% of cases. In 1.5%

(3) instances, ciprofloxacin was effective. 98.5% were resistant to chloramphenicol, 100% to meropenem and imipenem, and 99% to azithromycin.

Discussion

The Clinical Pattern Of Enteric Fever In The Pre-Study Was Comparable To That Described In Earlier Research Fever (Present In All Instances) Lasted An Average Of 16.9 Days With A Standard Deviation Of 6.6 Days. 86 (22.4%) Patients Reported Coughing, 36.2% (139) Reported Diarrhoea, 108 (28.1%) Reported Constipation, 153 Reported Vomiting, 37% Reported Anorexia, 36.7% (141) Reported Abdominal Pain, Lymphadenopathy Was Present In 140(36.5%) Patients, Jaundice Was Noted In 141 (36.7%) Patients, The 37% Patients Tongue Was Coated, And 36.2% Reported Hepatomegaly. In Contrast, Splenomegaly Was Discovered In 36.7% (141) Of Patients, Thrombocytopenia Was Identified In 127 (33.1%) Of Patients, And Anaemia Was Found In 40.6% (156) Of Patients¹¹.

The Typhidot Test Was Positive In 257 Individuals (66.9%), Whereas Blood Cultures Were Positive In 201 (52.3%). One (0.5%) Blood Culture Was Responsive To Ceftriaxone, Ampicillin, Amoxicillin, Cotrimoxazole, Cefixime, Co-Amoxiclav, And Cephalexin, Whereas The Rest 99.5%(200) Were Resistant To These Medications. Ciprofloxacin Was Sensitive In 1.5% (3) Instances. In Contrast, 98.5% Were Resistant, Chloramphenicol Sensitivity Was 1%, Meropenem And Imipenem Were 100% Sensitive, And Azithromycin Sensitivity Was 99%¹².

Conclusion

The Salmonella Typhi Isolated By Blood Culture Was Mainly Resistant To First-Line And Second- Line Antibiotics, Requiring Antibiotic Sensitivity And A Resistance Test For Rational Use Of Antibiotics Treating Enteric Fever.

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