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FREQUENCY OF ENCEPHALOPATHY IN CHILDREN WITH ENTERIC FEVER

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ABSTRACT

Objective: To determine the frequency of encephalopathy in children with enteric fever presenting at a tertiary care hospital. **Patients and methods:** This descriptive, cross-sectional study was conducted at Department of Pediatric Medicine Jinnah Hospital Lahore from January 2016 to December 2016. A total of 100 patients with enteric fever were recruited in our study. **Results:** Of these 95 study cases, 55 (57.8%) were boys and 40 (42.1%) were girls. Mean age of our study cases was 8.99 ± 3.2 years. Majority of the study cases with enteric fever i.e. 50(52.63%) were age more than 7 years. Mean Temperature was 102.30 ± 0.45 F^0. Mean disease duration (enteric fever) was 5.1 ± 2.18 days (with minimum disease duration was 5 days while maximum duration of fever was 8 days). Of these 95 study cases, 53 (55.8%) belonged to the rural areas and 42 (44.2%) were from urban territories. While majority of these children belonged to the families having poor socio-economic status 64 (67%), middle income socio-economic status was reported by 27 (28.4%) and 04 (6.1%) were from higher socio-economic status. Encephalopathy was seen in 20 (21%) of our study cases. **Conclusion:** Our study results have showed that frequency of encephalopathy is high among children hospitalized because of typhoid fever. Majority of our study cases belonged to poor socio-economic status families living in dirty areas where they have poor sanitation facilities. Encephalopathy was significantly associated with disease duration, increasing age in male gender and lower age groups in female gender.

KEYWORDS: Enteric fever, Encephalopathy, children.

INTRODUCTION

Enteric fever, a systemic infection, is caused by Salmonella, including S. enterica serotype Typhi (S. Typhi) and serotype Paratyphi (S. paratyphi).[1-5] Enteric fever leads to significant rise in pediatric mortality as well as morbidity particularly in developing countries worldwide the highest burden of this systematic infection is harbored in Asia notably in major urban subsets. Encephalopathy, in kids, could be a life threatening complication of enteric fever thus this study was conducted to document its frequency in our hospitalized kids thanks to enteric fever as there's no such study done antecedently in Asian country. This malady being transmissible by feco-oral route, is usually an unwellness of those regions where overcrowding due to inflated population, with poor sanitation facilities and consumption of contaminated water are major issues.[6] Enteric fever could be a severe enervating similarly as potentially life threatening systemic communicable disease. It's usually one among the foremost difficult issues. The clinical displays of enteric fever among kids vary greatly and frequently atypical manifestations result in vital diagnostic issue.[1] Usually its symptoms begin developing after 1 – 3 weeks of exposure of infectious agent which can vary from delicate to severe together with high grade fever, diarrhea, headache, and constipation, red spots on chest, malaise, enlarged spleen and liver. Symptoms typically develop 1–3 weeks after exposure, and will be mild or severe. They embrace high fever, headache, malaise, constipation or diarrhea, rosy spots on the chest and enlarged spleen and liver. Acute infection can also result in healthy carrier state.[2] The most commonly reported complications of severe enteric fever in pediatric population are "intestinal perforation, hemorrhage and extra-intestinal manifestations, including encephalopathy". Some reports from countries like United States, Nigeria, India, and Bangladesh reveal that approximately 75 % hospitalized cases of typhoid fever may develop varying neuropsychiatric exacerbation such as encephalopathy.[3] Encephalopathy is a common feature of severe enteric fever, which manifested as altered level of consciousness, such as disorientation, confusion, delirium and coma.[7-9] The reported incidences of enteric encephalopathy vary between 10% and 30%.[10] In the absence of appropriate treatment the

case fatality from enteric encephalopathy is as high as 56%.[10]

Enteric fever remains an important health issue of many developing countries like Paksitan.[11] It is estimated that 22 million cases and 216000 deaths occur worldwide each year[6].Enteric fever is endemic in developing countries[2]. Estimates of its worldwide burden suggests its annual rise of more than 12 million persons of which around 75 % exist in Africa and South-East Asia[11].Surveillance in India, Indonesia, Pakistan, Vietnam and China have been conducted by the International Vaccine Institute (IVI) observed it to be more common infection of childhood having its burden equally distributed among pre-school and school going ages.[12,13] Community-based studies reported from South Asian countries have indicated that its age-specific burden may be more among children of less than 5 years of age, and there are comparatively higher rates of associated complications and hospitalization.[14]

In a study conducted by Leung DT et al,[3] total 323 patients with positive blood culture for salmonella Typhi were studied. Of these 43 patients (21%) fulfilled the clinical criteria of encephalopathy at the time of admission.

The study was planned to be conducted to document the frequency of encephalopathy among targeted population because extensive research revealed that there is no such study conducted in Pakistan. The results of this study have generated useful data of our population at national level because database was missing from this part of world. The results of this study will be helpful for the researchers to design more advanced studies in future by using baseline data of our results. The results will also help in early diagnosis and proper management of this disease which will provide relief to the suffering families.

MATERIALS AND METHODS

Children admitted in pediatrics unit with enteric fever (more than 101 F for more than 3 days) and positive typhidot test were registered while patients with meningitis and cerebral malaria, Metabolic encephalopthies i.e. Hepatic, Uremic, hypertensive, Diabetic Ketoacidosis were excluded from our study. Informed consent was taken from the parents. The demographic information including name, age, sex, address was recorded in a predesigned proforma. Investigations were sent to a single laboratory of Jinnah Hospital, Lahore to overcome bias. Lumber puncture after fundoscopy for exclusion of meningo-encephalitis was done in all patients with altered mental status. The children were labeled as having enteric encephalopathy if there was altered mental status (GCS <15) with positive typhidot IgM. All collected data was entered in SPSS version 17 and analyzed. The quantitative data like age and temperature were presented as mean and standard deviation. The qualitative data gender (male/female), encephalopathy (yes/no), typhidot IgM (positive/ negative), GCS < 15 (yes/no) were presented as frequency & percentages. Effect modifiers were controlled by stratification of data with regard to age & gender of patients through chi-square test. P-value ≤0.05 was taken as significant.

RESULTS

Our study included 95 patients with enteric fever meeting inclusion and exclusion criteria of this study. Of these 95 study cases, 55 (57.8%) were boys and 40 (42.1%) were girls. Mean age of our study cases was 8.99 ± 3.2 years. Majority of the study cases with enteric fever i.e. 50(52.63%) were age more than 7 years. Mean Temperature was 102.30 ± 0.45 F^0. Mean disease duration (enteric fever) was 5.1 ± 2.18 days (with minimum disease duration was 5 days while maximum duration of fever was 8 days). Of these 95 study cases, 53 (55.8%) belonged to the rural areas and 42 (44.2%) were from urban territories. While majority of these children belonged to the families having poor socio-economic status 64 (67%), middle income socio-economic status was reported by 27 (28.4%) and 04 (6.1%) were from higher socio-economic status. Encephalopathy was seen in 20 (21%) of our study cases.

Table 1: Stratification of encephalopathy with regards to gender.

Gender	Encephalopathy		P- Value
	Yes (n=20)	No (n=75)	
Male (n=55)	11	44	0.85
Female (n=40)	09	31	
Total	95		

Table 2: Stratification of encephalopathy with regards to age.

Age groups	Encephalopathy		P- Value
	Yes (n=20)	No (n=75)	
1 – 7 Years (n=40)	8	32	1.00
More than 7 Years (n=55)	12	43	
Total	95		

Table 3: Stratification of encephalopathy with regards to disease duration (enteric fever).

Disease duration	Encephalopathy		P- Value
	Yes (n=20)	No (n=75)	
3 – 6 days (n=82)	09	73	0.000
More than 6 days (n=13)	11	02	
Total	95		

Table 4: Stratification of encephalopathy with regards to residential status.

Residential status	Encephalopathy		P- Value
	Yes (n=20)	No (n=75)	
Rural (n=53)	13	40	0.194
Urban (n=42)	07	35	
Total	95		

Table 5: Stratification of encephalopathy with regards to socio-economic status.

Socioeconomic status	Encephalopathy		P- Value
	Yes (n=20)	No (n=75)	
Poor (n=64)	14	50	0.235
Middle Income (n=27)	4	23	
Rich (n=04)	02	02	
Total	95		

DISCUSSION

Enteric fever leads to significant rise in pediatric mortality as well as morbidity particularly in developing countries worldwide. The highest burden of this systematic infection is harbored in Asia particularly in major urban subsets. Encephalopathy, in children, is a life threatening complication of enteric fever so this study was conducted to document its frequency in our hospitalized children due to enteric fever as there is no such study done previously in Pakistan. Our study included 95 patients with enteric fever meeting inclusion and exclusion criteria of this study. Of these 95 study cases, 55 (57%) were boys and 40 (42.1%) were girls. Hussain et al.,[15] reported 62 % boys were having enteric fever showing male gender predominance which is close to our study results. Iqbal et al.,[16] reported 63 % boys having enteric fever which is also in accordance with that of our study results. Lakhany et al,[17] from Karachi reported male to female ratio being 2:1 which is similar to our findings and Fazil et al.,[18] reported the same results.

Mean age of our study cases was 8.99 ± 3.2 years (with minimum age was 2 years while maximum age was 13 years). Our study results have indicated that majority of our study cases i.e. 56 (58%) were age more than 7 years. Fazil et al,[18] reported 5 ± 3 years age of children with enteric fever which is close to our study results. Khurshid et al.,[19] reported 6 years mean age of the children with enteric fever these findings are close to our study results. Similar results have been reported by Lakhany et al from Karachi,[17] and Iqal et al from Lahore 16 . Mean disease duration (enteric fever) was 5.1 ± 2.18 days (with minimum disease duration was 4 days while maximum duration of fever was 8 days). Our study results have indicated that majority of our study cases i.e. 84 (88.4%) had duration of fever between 3 – 6 days. Socio-demographic distribution plays a key role in the epidemiology of the enteric fever, people living in slum areas where there are poor facilities or drainage, sanitation and personal hygiene are more prone to these illnesses. Of our 95 study cases, 53 (55.7%) belonged to the rural areas and 42 (44.2%) were from urban areas. While majority of these children belonged to the families having poor socio-economic status 64 (67%), middle income socio-economic status was reported by 27 (28.4%) and 04 (6.1%) were from higher socio-economic status. Leung et al,[3] also reported same trends of poor socio-economic status and that of living in slum areas with poor sanitation facilities. Encephalopathy was seen in 20 (21%) of our study cases while it was not observed in 75 (78.9%) of the study cases. A study conducted by Leung et al,[3] reported 21 % encephalothy associated with enteric fever, these findings are very close to our study results.

CONCLUSION

Our study results have indicated that frequency of encephalopathy is high among children hospitalized due to enteric fever. Majority of our study cases belonged to poor socio-economic status families living in slum areas where poor sanitation facilities. Encephalopathy was significantly associated with disease duration, increasing age in male gender and lower age groups in female gender. Further studies are suggested on this topic from different parts of Pakistan to document its exact magnitude from different population subsets particularly in underdeveloped areas of Pakistan where problem seems worst.

REFERENCES

1. Islam MS, Rehman MH, Karim B, Khan RH. Clinical presentation of typhoid fever. Ibrahim Card Med J., 2011; 1(2): 40-44.
2. Steinberg EB, Bishop R, Haber P, Dempsey AF, Hoekstra RM, Nelson JM, et al. Typhoid fever in travelers: who should be targeted for prevention? Clin Infect Dis., 2004; 39: 186-91.
3. Leung DT , Bogetz J, Itoh M, Ganapathi L, Pietroni MA, Ryan ET et al. factors associated with encephalopathy in patients with salmonella enteric serotype typhi bacteremia presenting to a diarrheal hospital in Dhaka, Bangladesh. Am J Trop Med Hyg. 2012; 86(4): 698–702.
4. Sur D, Ochiai RL, Bhattacharya SK, Ganguly NK, Ali M, Manna B, et al. A cluster-randomized effectiveness trial of Vityphoid vaccine in India. N Engl J Med. 2009; 361: 335-44.
5. House D, Ho VA, Diep TS, Chinh NT, Bay PV, Vinh H, et al. Antibodies to the Vi capsule of Salmonella Typhi in the serum of typhoid patients and healthy control subjects from a typhoid endemic region. J Infect Dev Ctries, 2008; 2: 308-12.
6. Leung DT, Bogetz J, Itoh M, Ganapathi L, Pietroni MA, Ryan ET, et al. Factors associated with encephalopathy in patients with Salmonella enterica serotype Typhi bacteremia presenting to a diarrheal hospital in Dhaka, Bangladesh. Am J Trop Med Hyg, 2012; 86(4): 698-702.
7. Das SK, Chisti MJ, Afrad MH, Malek MA, Ahmed S, Ferdous F,, et al. Gastroenteritis due to typhoidal Salmonella: a decade of observation at an urban and a rural diarrheal disease hospital in Bangladesh. BMC Infect Dis., 2014 Aug 7; 14: 435. doi: 10.1186/1471-2334-14-435.
8. Parry CM, Wijedoru L, Arjyal A, Baker S. The utility of diagnostic tests for enteric fever in endemic locations. Expert Rev Anti-infect Ther. June, 2011; 9(6): 711-725.
9. Chisti MJ, Bardhan PK, Huq SK, Khan WA, Khan AM, Salam MA. High-dose intravenous dexamethasone in the management of diarrheal patients with enteric fever and encephalopathy. Southeast Asian J Trop Med Public Health, 2009; 40(5): 1065-73.
10. Ochiai R Leon, Acosta CJ, Danovaro-Holliday MC, Baiqing D, Bhattacharya SK, Agtini MD et al. A study of typhoid fever in five asian countries: disease burden and implications for controls. Bull World Health Organ, 2008; 86(4): 260-68.
11. Lutterloh E, Andrew L, Sejvar J, Manda R, Naiene J, Stephan SM, et al. Multidrug-resistant typhoid fever with neurologic findings on the Malawi-Mozambique border. Clin Infect Dis., 2012; 54(8): 1100-6.
12. Mutanabbi M, Islam KA, Helal MA, Mamun HA, Quader M, Ahmed S. Retrospective analysis of 52 cases of enteric fever in a tertiary care hospital in Dhaka city. Bangladesh J Med, 2010; 21: 71-73.
13. Bhutta ZA. Enteric fever. In: Kliegman RM, Jenson HB, Behrman RE, Stanton BF, editors. Nelson Textbook of Peidatrics. USA: Elsevier, 2011; 954-58.
14. Lipton SA, Rosenberg PA. Excitatory amino acids as a final common pathway for neurologic disorders. N Engl J Med, 1994; 330: 613-22.
15. Hussain W, Aslam M, Haider A, Jaffery G, Malik A. Clinical spectrum of Typhoid Fever in children a descriptive study at Shaikh Zayed Hospital, Lahore Pak Paed J., 2002; 26(2): 71-5.
16. Iqbal SMJ, Serfraz M, Khan MMN. Clinical spectrum of typhoid fever in children. Ann King Edward Med Uni, 2004; 10(4): 366-7.
17. Lakhany B, Akhtar J, Qureshi AH, Akhtar R. The study of 100 children with Enteric fever. J Surg Pak., 2004; 9(2): 29-30.
18. Fazil M. Clinical manifestations of enteric fever in various age groups of children clinical manifestations of enteric fever in various age groups of children. Pak Paed J., 2012; 36(3): 142-5.
19. Khurshid A, Rashid J. Clinical presentation of typhoid fever. Ann King Edward Med Uni, 2006; 12(4): 556-9.