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CLINICAL SPECTRUM OF FEVER CASES IN CORRELATION WITH HEMATO-BIOCHEMICAL PARAMETERS- AN EXPERIENCE FROM A NORTH INDIAN HOSPITAL.

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ABSTRACT

Introduction: The purpose of this study is to study the clinical spectrum of fever cases, outline the hemato-biochemical and serological parameters and delineate a syndromic approach to tropical infections in a Tertiary hospital of North India.

Methods: The study included 926 cases of fever admitted to our hospital, GMC Jammu, in medical wards over a period of six months and corelating their clinical manifestations with the lab parameters (hematological, biochemical, serology) and imaging modalities.

Results: Out of 926 cases admitted with fever, 78 (8.4 %) cases were undifferentiated viral fever, 140 (15.2%) were enteric fever, 85(9.2%) were dengue, 126(13.6%) were malaria, 28(3%) of hepatitis A and 26(2.8%) of hepatitis E, 14(1.5%) of varicella, 86(9.4%) of pneumonia and 81(8.7%) of UTI.45(4.9%) liver abscess were reported along with 186(20.1%) cases of Rickettsial Fever, 0.2% of leptospirosis and 0.6% of Tuberculosis .

Conclusion: We demonstrate a wide range of pathogens associated with severe febrile illness and highlight the substantial information gaps regarding the geographic distribution and role of common pathogens. High quality severe febrile illness etiology research that is comprehensive with respect to pathogens and geographically representative is needed.

KEY WORDS : Tropical infections, dengue fever, enteric fever, Rickettsial Fever, leptospirosis.

INTRODUCTION

Fever is a common reason for seeking healthcare in low-and middle-income countries [1]. Among patients with febrile illness requiring admission case fatality ratios are high, sometimes exceeding 20% [2–6].Fever etiology research [4,7,8]and the more widespread useof malaria diagnostic tests following changes to malaria treatment guidelines [9,10] have highlighted theproblem of malaria over-diagnosis among patients with severe febrile illness. Apparent declines in malaria illnesses and deaths associated with malaria control efforts mean that the proportion of febrile patients with malaria has declined over the past decade [11, 12]. Comprehensive, standardized, and high quality, multi-center etiology research is being undertaken to understand the causesof severe childhood diarrhea and pneumonia [13, 14] but such an approach has not been taken for fever. The many causes of fever are difficult to distinguish clinically [4,7,8] and laboratory services may be limited or absent in low-resource areas [17].Consequently, clinicians frequently lack information about the local epidemiology of causes of severe febrile illness needed to adapt international management guidelines. Similarly disease control programs lackdatato set priorities for prevention.

To describe epidemiologic patterns and to identify data gaps in our understanding of severe febrile illness in low resource areas, we sought to systematically review prospective hospital based study of the etiology of febrile illness.

METHODOLOGY

A cross-sectional study was conducted over a period of 6 months from 1 June 2018 to 1 Dec 2018. All 15 to 85 years aged admitted cases with history of fever over 38.3 degrees C for < 3 weeks of duration without any specific localizing signs or symptoms were enrolled for the study. All critically ill patients requiring direct admission to ICU, cases of localized infection like abdominal infections, meningitis etc., patients of severe sepsis with septic shock, haematological malignancies, autoimmune disorders, those on immunosuppressant, fever > 3 weeks' time (PUO) were excluded from the study. Following information was retrieved: demographic data including age, sex and clinical hospitalization data including rash, vomiting, headache, joint pain, diarrhoea. Relevant biochemical, haematological and serological data were also retrieved for eg.Dengue NS1 Ag/IgM antibody, malarial parasite slide/card, Rickettsial serology,typhidot assay. Laboratory results were interpreted as per standard diagnostic criteria's for different etiologies.

Data thus collected were incorporated in to Microsoft excel sheet and analysed using IBM SPSS version 20 software (trial version).

RESULTS

A total of 1560 patients were admitted during study period of 6 months. Out of these, 926 were enrolled in study and 634 were excluded as per exclusion criteria. Of total 926 patients,males (58.3%) were more commonly affected in comparison to females (41.7%). (Table 1) Majority of the patients were young, in their second, third and fourth decades of life with 57.9% of patients between 15 to 45 years of age. 2.8% of patients were above age of 86 years. (Table 2)

Symptoms associated with fever were vomiting (44.3%), malaise (62.6%), joint pain (30.7%), cough (60 %), rashes (41.5%) and diarrhoea (15.8%). (Table 3)

On general examination 384(41.5%) patients had icterus while pallor was present in 206(22.2%) patients. 504(54.4%) cases were found to have hepatosplenomegaly. Although 410(44.3%) cases had added breath sounds.(Table 4)

On further hematological and biochemical workup, 626 (67.6%) cases had leukocytosis while 184 (19.9%) cases had leucopenia. 402 (43.4%) patients have thrombocytopenia. (Table 5)

516(55.7%) cases were found to have elevated bilirubin while

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deranged SGOT, SGPT and RFT were found in 480(51.8%), 386(41.7%) and 204(22%) cases respectively. (Table 6)

Among these 926 study participants, etiologically 13.6% were diagnosed as Malaria, 15.2 % as typhoid, 9.2 % as dengue, 20.1% as Rickettsial Fever, 8.7% as Urinary tract infections and 8.4% remains undiagnosed. (Table 7).

History of hypertension, diabetes, cardiovascular diseases and COPDs was asked. These all comorbidities, combined together were present in 9.1 % of patients.

Average length of stay for majority was between 3 to 5 days with mean length of stay was 4.36 days.

DISCUSSION

Our study showed high incidence of tropical infections such as Clinical Enteric fever, Dengue, Malaria, Varicella, UTI and hepatitis A and E with most common infection in our area as Rickettsial Fever. Few research works in Northern India also reveal the same [2,3,4,5].Most common age group affected in this study was between 15-45 years of age, reflecting young economically active people are affected more with these illnesses which were also supported by literature.[14] Increased outdoor exposure to mosquitoes and ticks, use of contaminated water may be factor responsible for this. Males predominate over female in this study. Similar observation was made by other study conducted in northern India. [15] It can also be explained with more outdoor activities and more risk of exposure for mosquito bite among males. In our study 85(9.2%) cases were diagnosed as dengue fever. A study from SGPGI Lucknow in 2005 looked at liver involvement in 45 cases of proven dengue fever, 15 % of cases had clinical jaundice while transaminases elevation was practically universal (96%). The bedside clues to dengue in a given case of fever with MODS are hemoconcentration, hypoalbuminemia, manifestation of plasma leak, thrombocytopenia and leucopenia[5,6].In day to day practice the laboratory diagnosis is centered on serology.

It is useful to remember that geriatric age group with UTI or pneumonia often present with febrile encephalopathy with few other clinical signs. In our study 86(9.4%) cases had pneumonia (clinic-radiologically proven). 186 patients presented with rickettsial disease .The disease occurs 7-10 days after the bite of larval from of trombiculid mite and present with fever, relative bradycardia, severe myalgias and a non-pruritic macular-papular rash . Splenomegaly was detected in 44 to 52% of the cases described in the recent outbreaks in the Shimla hills while the characteristic eschar was seen only in a minority of cases (9.5%)[7,8]. Both of our cases had characteristic eschar formation with splenomegaly and serositis. Clinical jaundice and deranged LFTs have been described in outbreaks of scrub typhus seen in Shimla hills with a reported incidence of jaundice in 10-52% and elevated AST/ALT in 28 to 67 % cases.

Malaria positive cases and enteric cases were found 13.6 % and 15.2 % respectivlely in present study which was comparable to a study done by Balvinderetal in which was reported 4.7%. & 10.9% respectively.[9] Comorbidities like HTN, DM2, CAD, COPD combined together were present in 9.1% of patients in these studies. Low incidence of comorbidity may be explained by relatively younger people getting affected from the illness, as these comorbidities are usually associated with the advanced age. Present epidemiological evidence of association of comorbidities with severity of illness is limited and only suggestive. However it is important to identify these comorbidities early and patient should be kept in close observation if needed to improve outcome and avoid complications.[16]

LIMITATION OF STUDY

- The limitation of our study is that it excluded the paediatrics age group or else we could have expected to have different fever etiology due to exposure and immunity.Hence, it is prudent that the pattern of fever etiology found in our study is not representative of general population.
- Data to differentiate vivax from falciparum and serial platelet counts could not be collected in this study. Enteric fever cases would have been diagnosed better if tests for blood culture and Widal test data could have been correlated. Though sensitivity and specificity of the serological testing for various aetiologies are not 100% and chances of over or under diagnosis is there. However, this number should not be large enough to interfere with the purpose of the study

CONCLUSION

We demonstrate a wide range of pathogens associated with severe febrile illness and highlight the substantial information gaps regarding the geographic distribution and role of common pathogens. High quality severe febrile illness etiology research that is comprehensive with respect to pathogens and geographically representative is needed.Acute febrile illness formed the main category in this study, reflecting the need of broader diagnostic approach to identifying a broad range of infectious agents. A protocol based approach for diagnosing and managing Acute Febrile illness will reduce the cost, burden on healthcare professional and help in selective use of antibiotics and antimalarials. Hence, need of protocol is well understood and it is to be established by each institute depending on their local prevalence and pattern of the illness.

Declaration of Conflicts of Interest-
All authors have none to declare.

TABLE 1 -SEX DISTRIBUTION

Sex	Number Of Patients (n)	Percentage (%)
Male	540	58.3
Female	386	41.7
Total	926	100

TABLE 2- AGE DISTRIBUTION

Age(In Yrs)	Number Of Patients(n)	Percentage (%)
15-25	164	17.7
26-35	174	18.8
36-45	198	21.4
46-55	126	13.6
56-65	78	8.4
66-75	74	8
76-85	86	9.3
>86	26	2.8
TOTAL	926	100

TABLE 3-ASSOCIATED SYMPTOMS WITH FEVER

Symptoms	Number Of Patients(n)	Percentage (%)
Cough	246	60
Rash	384	41.5
Burning Micturation	216	23.3
Diarrhoea	146	15.8
Rigor And Chills	410	44.3
Malaise	580	62.6
Joint Pains	284	30.7
Chest Pain Breathlessness	136 190	14.7 20.5
Pain Abdomen	289	31.2
Vomiting	410	44.3

TABLE 4- CLINICAL SIGNS IN PATIENTS

Clinical Signs	Number Of Patients(n)	Percentage (%)
Pallor	206	22.2
Icterus	384	41.5
Hepato-splenomegaly	504	54.4
Added Breath Sounds	410	44.3
Pedal Edema	126	13.6
Neck Stiffness		
Renal Tenderness	56	6.04

TABLE 5-HEMATOLOGICAL FINDING

Hematological Finding	Number Of Patients(n)	Percentage (%)
Leucocytosis(>11000/cumm)	626	67.6
Leucopenia(<4000/cumm)	184	19.9
Thrombocytopenia(<1.5lac/cumm)	402	43.4
Abnormal Pti	101	10.9

Table 6-patients With Abnormal Lft And Kft

Parameter	Number Of Patients (n)	Percentage (%)
Raised Sgot	480	51.8
Raised Sgpt	386	41.7
Raised Bilirubin	516	55.7
Raised S.urea Or Creatinine	204	22

Table 7-different Tropical Infections/etiology Of Fever Detected In The Study

Etiology	Number Of Patients (n)	Percentage (%)
Enteric Fever	140	15.2
Dengue	85	9.2
Malaria	126	13.6
Pneumonia	86	9.4
UTI	81	8.7
Meningo- encephalitis		
Rickettsial Fever	186	20.1
Hepatitis A	28	3
Hepatitis E	26	2.8
Varicella	14	1.5
DRUG Fever	18	1.9
Undifferentiated Viral Fever	78	8.4
Liver abscess	45	4.9
HIV	5	0.5
Leptospirosis	2	0.2

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