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# A Prospective Study- Clinical Profile of Fever

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**ABSTRACT**
Fever is well known to the ancients as an important manifestation of illness. Fever is an easily noted and reliable marker of illness. The spectrum of diseases causing fever seems to be determined by geographical factors and time. There are only a few studies on fever from South India on fever.

**Keywords:** enteric fever, meningitis, tuberculosis, connective tissue disorders

## INTRODUCTION

## OBJECTIVES:

1. To study the clinical profile of patients presenting with fever, that is, demography, history, physical examination findings and results of investigations.

2. To elucidate the causes of fever in patients attending New Government General Hospital, Vijayawada.

3. To develop a working plan (algorithm) to diagnose common fevers in this region.

## MATERIALS AND METHODS

**DESIGN**: Prospective Clinical study.

**SETTING:** Medical wards, Department of Medicine, New Government Hospital Vijayawada.
**SUBJECTS:** Patients admitted in Medical Wards in which the investigator is posted and it's corresponding wards (I and IV, II and V, III and VI) of New Government Hospital during the period 1st August 2016 to 31 st July 2017.

## SAMPLING:

Based on statistical data available from Department of Medicine, New GGH Vijayawada, on an average, 18 male patients and 10 female patients are admiited weekly in to Medical Service with complaints of fever. As the study period extends over a year, total number of patients admitted with complaints of fever in this period will be around 1456. Balancing feasibility criteria and to serves the purpose of this study a suitable sample of these patients is taken and studied.

Sampling frame consists of patients admitted in male and female wards of the Unit in which the investigator is working as a resident and the male and female wards of the corresponding collaborating Unit. This includes patients of the respective units, with fever who are admitted in the Acute Medical Care ward. Thus they form into four subgroups viz; 1, 2, 3 and 4. During the study period, one group patients will be evaluated in a week. The first cycle will be determined by drawing lots and the cycle will

be repeated throughout the study period. All patients with fever belonging to the group selected will be evaluated.

Subgroup 1 - Patients admitted to male medical ward in which the investigator is working as a resident.

Subgroup 2 - Patients admitted to corresponding female medical ward in which the investigator is working as a resident.

Subgroup 3 - Patients admitted to female medical ward in which the investigator is working as a resident.

Subgroup 4 - Patients admitted to corresponding male medical ward in which the investigator is working as a resident.

**INCLUSION CRITERIA**

1. Patients above the age of 12 years, both male and female patients.
2. Patients presenting with complaints of fever.

INVESTIGATIONS (based on symptoms and signs):

CBC, ESR and Hb (gms %), Complete hemogram with special reference to differential count and absolute eosinophil count,Urinalysis for detection of pus cells, RBC,Peripheral blood smear for malarial parasite – thin and thick smears,Widal test,Ig M ELISA for Dengue,Chest X-ray PA view,Sputum for Gram's and Ziehl-Neelson' method of staining and culture,Stool examination – for detection of trophozoites, cysts, ova, polymorphs and RBCs,CSF Analysis- TC, DC, sugars, proteins, Gram's staining, Ziehl-Neelson staining, Indian ink preparation, culture, ADA levels, simultaneous RBS,Pleural fluid analysis- TC, DC, sugars, proteins, Gram's staining, Ziehl-Neelson staining, culture, ADA levels,Ascitic fluid analysis- TC, DC, sugars, proteins, Gram's staining, Ziehl-Neelson staining, culture, ADA levels, simultaneous serum proteins, SAAG, Ultrasonography of abdomen,Urine culture, Blood culture,Stool culture,CT scan when intracranial pathology is suspected.,Weil – Felix reaction.,Dark field microscopy for spirochetes,Leptospira Ig M antigen.,ASO titres.,Detection of HBsAg and HCV antibodies,Detection of HIV antibodies,Throat swab culture,Other relevant investigation wherever necessary

Complete history, thorough and repeated physical examination at the time of admission and during the hospital stay and relevant investigations are done to arrive at a diagnosis.

**RESULTS**

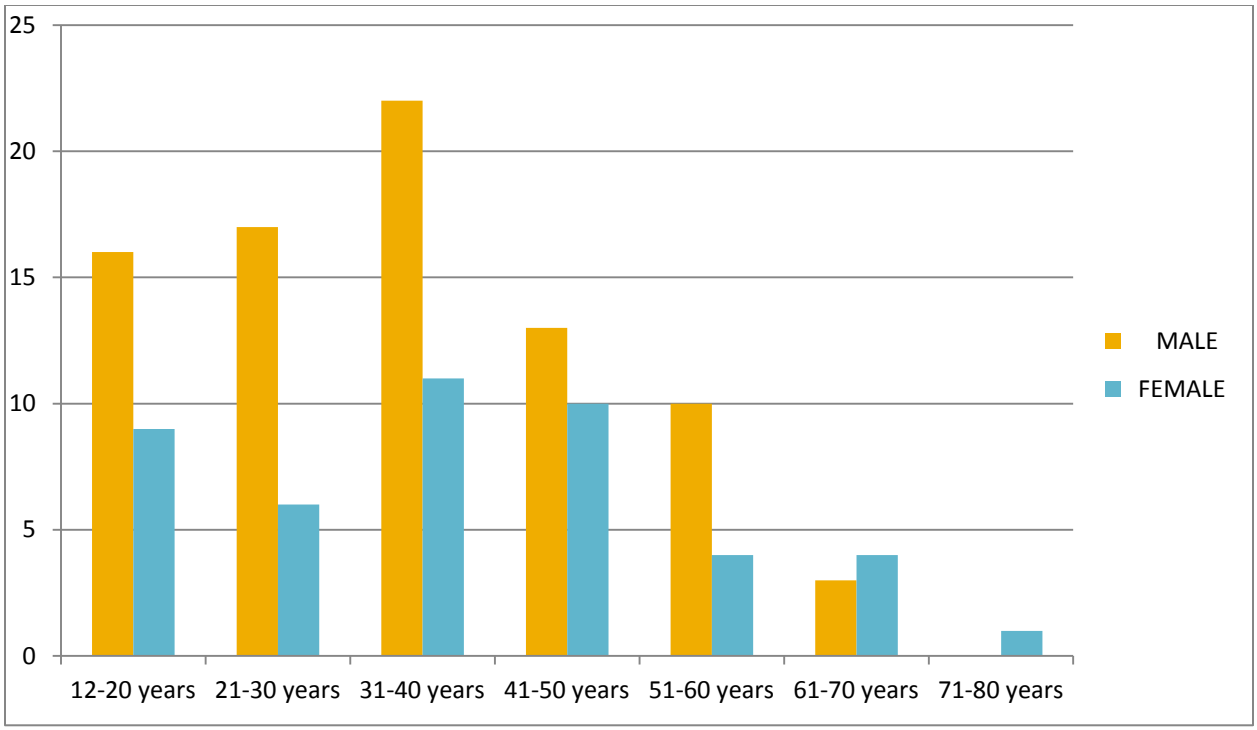
Total number of patients with fever admitted to the hospital during the study period is 1029. Number of patients included in the study by sampling is 126 constituting an ascertainment level of 12.24 per cent.

**AGE & SEX DISTRIBUTION OF PATIENTS:**

Majority of patients presenting to the hospital are in the age group of 31-40 years (26.2%). This age group of population is closely followed by 12-20 years (19.8%), 21-30 years (18.3) and 41-50years (18.3) age groups.



Volume 1, Issue 2; July-August 2018; Page No. 122-130




**SEX DISTRIBUTION OF THE PATIENTS:**

The relative frequency of patients presenting to the hospital with fever is more in males (64.28%) than females (35.72%)

| Sex | No of patients | Percentage |
|---|---|---|
| Male | 81 | 64.3 |
| Female | 45 | 35.7 |
| Total | 126 | 100.0 |

**DISTRIBUTION OF DURATION OF FEVER AMONG THE PATIENTS:**

Out of 126 patients studied, 52(41.3%) patients presented with fever <1 week duration. 27 patients presented with fever 1-2 weeks duration, 22 patients presented with fever of 2-3 weeks duration and 25 patients with fever >3 weeks duration

| Fever duration | No. of patients | Percentage |
|---|---|---|
| Fever <1 week | 52 | 41.3 |
| Fever 1-2 weeks | 27 | 21.4 |
| Fever 2-3 weeks | 22 | 17.5 |
| Fever >3 weeks | 25 | 19.8 |



Volume 1, Issue 2; July-August 2018; Page No. 122-130

**SYMPTOM ANALYSIS:**

Most of the patients had chills and rigors associated with fever (78.6%). The second most common symptom is headache, which is present in 70 patients (55.6%). It is followed by cough and sputum (16.7%), pain abdomen (14.3%), altered sensorium (13.5%), vomiting (11.9%) and jaundice (11.9%). 9 patients (7.1%) had no symptoms other than fever.

| S.No | SYMPTOM | No.OF PATIENTS | PER CENT |
|---|---|---|---|
| 1 | Fever with chills | 99 | 78.6 |
| 2 | Fever without chills | 27 | 21.4 |
| 3 | Cough | 21 | 16.7 |
| 4 | Sputum | 21 | 16.7 |
| 5 | Pleuritic Chest Pain | 5 | 4.0 |
| 6 | Breathlessness | 4 | 3.2 |
| 7 | Hemoptysis | 5 | 4.0 |
| 8 | Headache | 70 | 55.6 |
| 9 | Pain abdomen | 18 | 14.3 |
| 10 | Burning micturition | 8 | 6.3 |
| 11 | Diarrhoea | 6 | 4.8 |
| 12 | Vomittings | 15 | 11.9 |
| 13 | Jaundice | 15 | 11.9 |
| 14 | Rash | 11 | 8.7 |
| 15 | Joint Pains | 7 | 5.6 |
| 16 | Seizures | 7 | 5.6 |
| 17 | Altered sensorium | 17 | 13.5 |
| 18 | No other symptoms | 9 | 7.1 |

**ANALYSIS OF CLINICAL SIGNS:**

Among the patients included in this study, 70 patients (55.6%) had pallor. Splenomegaly is the second most common clinical sign present in 19 patients (15%). Other common clinical signs include icterus (13%), neck rigidity (11%), hepatomegaly (10%), rash (10%) and Kernig's sign (10%). 40 patients (31.7%) had no obvious contributory physical signs.

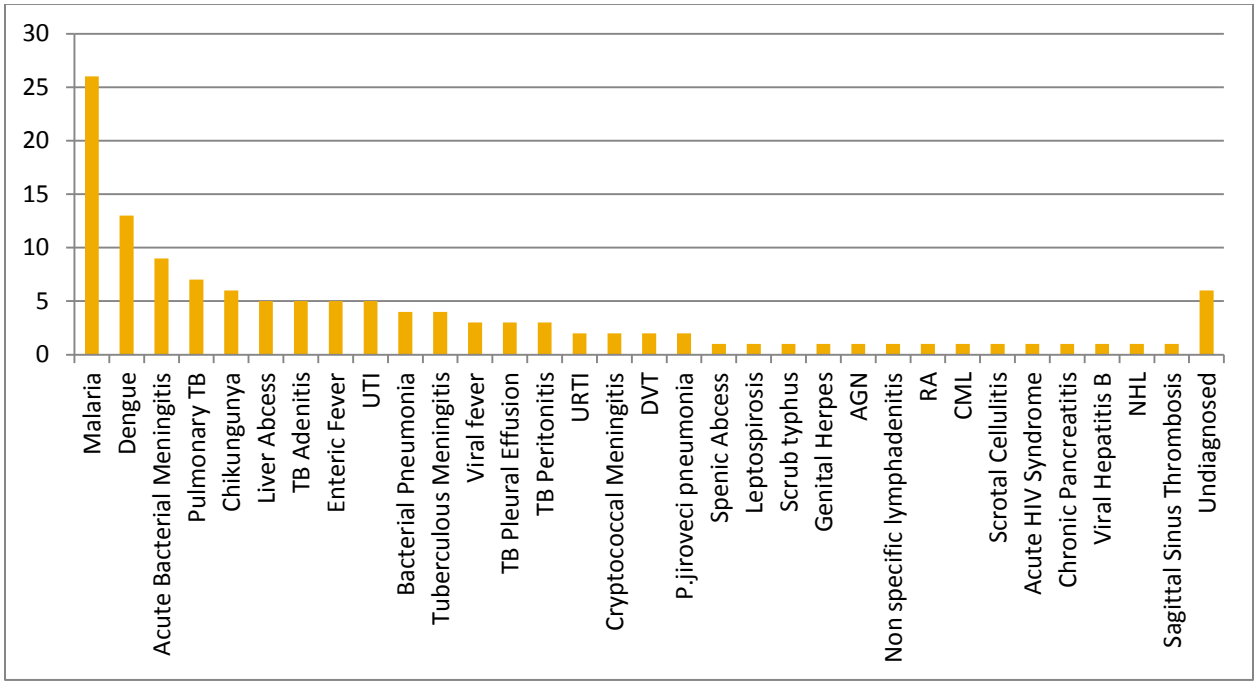
| Clinical Sign | No.of Patients | Per cent |
|---|---|---|
| 1.Pallor | 70 | 55.6 |
| 2.Icterus | 17 | 13.5 |
| 3.Pedal edema | 4 | 3.2 |



Volume 1, Issue 2; July-August 2018; Page No. 122-130

| | | |
|---|---|---|
| 4.Lymphadenopathy | 12 | 9.5 |
| 5.Rash | 13 | 10.3 |
| 6.Dull note on chest percussion | 10 | 7.9 |
| 7.Bronchial breath sounds | 8 | 6.3 |
| 8.Diminished breath sounds | 5 | 4.0 |
| 9.Decreased VF/VR | 4 | 3.2 |
| 10.Increased VF/VR | 8 | 6.3 |
| 11.Hepatomegaly | 13 | 10.1 |
| 12.Splenomegaly | 19 | 15.1 |
| 13.Abdominal distension | 5 | 4.0 |
| 14.Neck rigidity | 14 | 11.1 |
| 15.Babinski sign | 9 | 7.1 |
| 16.Pupillary abnormalities | 4 | 3.2 |
| 17.Kernig's sign | 13 | 10.3 |
| 18.Eschar | 1 | 0.8 |
| 19.No obvious contributory physical sign | 40 | 31.7 |

In this study, the first five most common diagnoses include Malaria (20%), Dengue hemorrhagic fever (10%), Acute baterial meningitis (7%), Pulmonary tuberculosis (5%) and Chikungunya (4%). The other important diagnoses are Liver abscess (4%), TB adenitis (4%), Enteric fever (4%) and Urinary tract infection (4%).



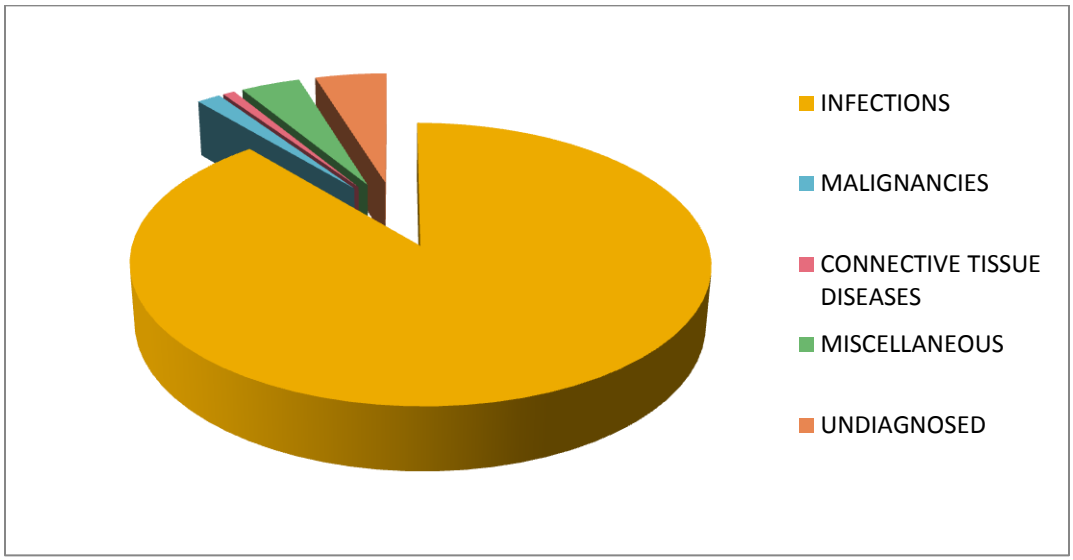

Among the diagnostic categories, infections (89%) are the commonest cause of fever. 6 patients remained undiagnosed.



Volume 1, Issue 2; July-August 2018; Page No. 122-130

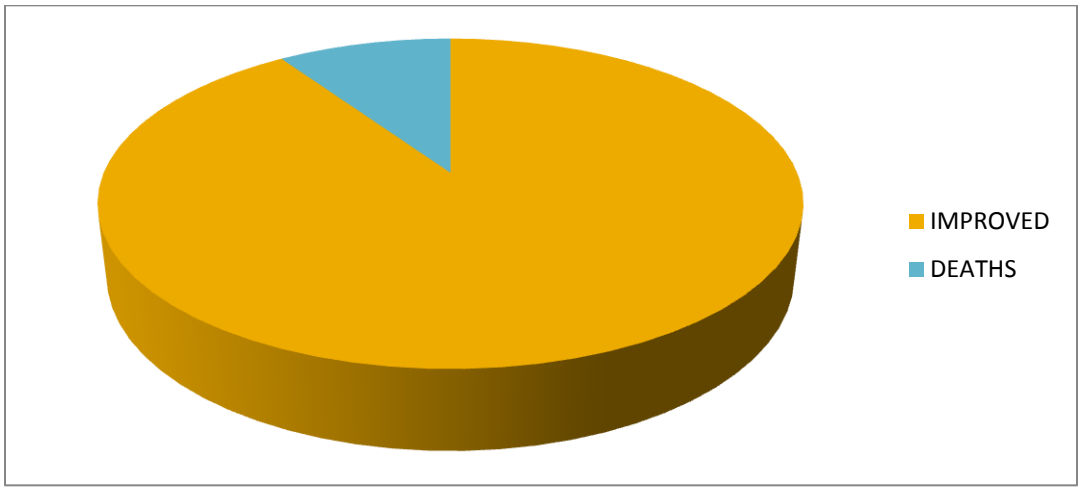
**Diagnostic Categories**

| Diagnostic Category | No. of patients | Percentage |
|---|---|---|
| Infections | 112 | 88.9 |
| Malignancies | 2 | 1.7 |
| Connective Tissue Disease | 1 | 0.8 |
| Miscellaneous | 5 | 3.8 |
| Undiagnosed | 6 | 4.8 |




**OUTCOME**

Among the 126 patients studied, 12 patients died. bacterial meningitis is the most common cause of death (6 patients). 2 patients died of cerebral malaria and 2 of tuberculous meningitis. One patient died of Dengue shock syndrome with Acute Kidney Injury (AKI) and one of cryptococcal meningitis. Among the 12 patients died, two were infected with HIV.




**DISCUSSION**

Fever is one of the most common causes of hospitalization in the tropics. The spectrum of fever ranges from self-limiting short febrile illnesses to life-threatening disorders.



Volume 1, Issue 2; July-August 2018; Page No. 122-130

Out of 1029 patients presented to the hospital with fever between 1st August 2016 to 31 st July 2017, 126 patients formed the study population, an ascertainment level of 12.24 per cent. . Of them, 81 are males and 45 are females. Most of them fell in the age group of 31-40 years. Majority of the patients presented with fever <1 week duration.

Out of 126 patients studied, 112 were due to infections (89%), 2 were due to malignancies and 1 due to connective tissue disease.

**Infectious diseases**:

This study comprises of patients with infectious diseases of 89%. This is in contrast to 36% in Petersdorf and Beeson series[1], 33% in Petersdorf and Larson series[2], 50% in Sharma BK et al series[3], 43.8% in Handa et al series, 46.4% in A Jung et al series, 58.3% in Dipanjan Bandhyopadhyay et al series[4].

**Malaria:**

Out of 126 patients, 26 patients were diagnosed as malaria. Of them 15 had clinical malaria, i.e. malarial parasite was not found in the peripheral smears of these patients. A clinical diagnosis of malaria is made based on their response to anti-malarial drugs. Out of the rest 11 patients, P.vivax was found in 6, P.falciparum in 4 and both vivax and falcipraum in one patient.

**Dengue hemorrhagic Fever (DHF):**

13 patients were diagnosed as having DHF. All of them were diagnosed on the basis of detection of Ig M antibodies by ELISA. One female patient presented with rash, hemorrhagic ascites and landed in AKI. The clinical course of rest of the 12 was uncomplicated.

**Acute Bacterial Meningitis:**

9 patients were found to have acute bacterial meningitis. They were diagnosed based on the classical clinical signs - neck rigidity and Kernig's sign and suggestive CSF picture.

**Pulmonary Tuberculosis:**

7 patients had pulmonary TB. Out of them, 5 had their sputum positive for M.tuberculosis by Z-N staining. Rest were diagnosed based on suggestive chest x-ray features of the seven, 3 were coinfected with HIV.

**Chikungunya:**

6 patients had chikungunya. They were diagnosed with the help of ELISA(detection of IgM antibodies).

**Liver Abscess:**

5 patients were diagnosed as having liver abscess. All of them were diagnosed by ultrasonography. 4 patients had single abscess, 1 had multiple abscesses. Pus examination was inconclusive. All of them responded to chloroquine.

**Tuberculous Adenitis :**

5 patients had tuberculous adenitis. All of them had cervical nodes involvement. All of them were diagnosed by FNAC. Out of 5, 2 were coinfected with HIV.

**Enteric fever:**

5 patients were diagnosed as enteric fever. All the five had widal test positive. Two of them had their blood cultures positives for S.typhi in addition.

**Urinary tract infection:**

5 had UTI. Of them, two were diabetics. All of them were diagnosed urine culture.

**Bacterial pneumonia:**

4 had bacterial pneumonia. They were diagnosed based on clinical signs and chest x-ray features.

**Tuberculous meningitis:**

4 were diagnosed as TB meningitis. They were diagnosed based on CSF picture and their response to ATT. Out of 4, 1 was coinfected with HIV.

**Viral fever:**

3 patients presented with viral fever. There were no clinical symptoms or signs related to a particular system. All of them had thrombocytopenia. They improved without antibiotics.

**Tuberculous Pleural Effusion:**

3 had pleural effusions of tuberculous etiology. All were diagnosed based on pleural fluid analysis including raised pleural fluid ADA levels. Out of them, 1 was a patient with CKD.

**Other infections:**

Cryptococcal meningitis was diagnosed based on CSF Indian ink preparation positive for Cryptococci.



Volume 1, Issue 2; July-August 2018; Page No. 122-130

Both the patients with cryptococcal meningitis were coinfected with HIV. P.jirovei pneumonia was diagnosed by clinical picture--HIV patients with dyspnea, low saturation levels, normal chest X-ray and response to cotrimoxazole.

Splenic abscess was diagnosed based on ultrasonography, Leptospirosis by Ig M antibody detection, Scrub typhus by presence of eschar and Weil-Felix test. Genital Herpes is a clinical diagnosis based on presence of characteristic lesion.

**Malignancies:**

2 patients (1.58%) had malignancies. This is in contrast to 20% in Petersdorf and Beeson series, 33% in Petersdorf and Larson series, 8.5% in Sharma et al series, 8.3% in Handa etal series, 17% in Kejariwal et al series and 22% in Dipanjan Bandhypopadhyay et al series.

One patient had CML. She was diagnosed by peripheral smear examination. Other had Non-Hodgkin Lymphoma. He was diagnosed by FNAC.

**Connective Tissue Diseases:**

Only one patient presented with Rheumatoid Arthritis. He was diagnosed based on ACR-EULAR 2010 criteria.

In Petersdorf and Beeson series, 15% patients, Petersdorf & Larson series 9% patients, Sharma et al series 12.8% patients, Handa et al series 15.7% patients, Kejariwal et al series 11 % patients, Dipanjan Bandyopadhyay et al series 11% patients had connective tissue dieases.

**Miscellaneous causes:**

Two patients had DVT. Out of them, one was infected with HIV. Both were diagnosed based on Venous Doppler of lower limbs. One patient presented with seizures and headache. She was diagnosed as Sagittal sinus thrombosis based on CT scan brain. One patient was diagnosed as Acute glumerulonephritis. One patient was diagnosed as chronic pancreatitis with the help of ultrasound.

**Undiagnosed:**

5% of patients were undiagnosed. This is in contrast to 7% in Petersdorf and Beeson series, 13% in Petersdorf and Larson series, 2.8% in Sharma et al series, 26.6 in Jung et al series, 14% in Kejariwal et al series, 12% in Dipanjan Bandhyopadhyay et al series.

| S. No | AUTHORS | DATES OF STUDY | INFECTION | NEOPLASMS | CONNECTIVE TISSUE DISEASES | MISCELLANEOUS | UNDIAGNOSED |
|---|---|---|---|---|---|---|---|
| 1 | PETERSDORF AND BEESON | 1952-1957 | 36 | 19 | 15 | 23 | 7 |
| 2 | PETERSDORF AND LARSON | 1980 | 32 | 33 | 9 | 18 | 13 |
| 3 | B K SHARMA et al | 1984-1985 | 52.8 | 8.5 | 12.8 | 4.2 | 2.8 |
| 4 | HANDA et al | 1994-1995 | 43.8 | 8.3 | 15.7 | 13.2 | 19 |
| 5 | A JUNG et al | 1993 | 46.4 | | | | 26.6 |
| 6 | D KEJARIWAL et al | 1998-2001 | 53 | 17 | 11 | 5 | 14 |



Volume 1, Issue 2; July-August 2018; Page No. 122-130

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|---|---|---|---|---|---|---|---|
| 7 | DIPANJAN BANDHYOPADHYAY et al | 2008-2009 | 58.53 | 22 | 11 | | 12 |
| 8 | PRESENT STUDY | 2016 | 88 | 2 | 1 | 4 | 5 |

The results of the study are similar to many other studies on fever[5,6,7,8] across the world, that is , infections are the most common cause of fever.

6 patients remained undiagnosed even after possible extensive work-up. All of them responded well to antibiotics.

Out of 126 patients, 12 patients died (9.5 per cent), a case fatality rate of All of them died in the hospital within 3 days of admission.

**CONCLUSIONS:**

Infections are the most common cause of fever. Among infections, vector borne diseases like malaria and dengue are common. Various forms of tuberculosis, both pulmonary and extrapulmonary also has important place among infections, as a cause of fever. HIV prevalence is also growing, making it one of the common causes of fever.

Other disorders like neoplasms, connective tissue diseases are only rare causes of fever in the region of study. Careful history and physical examination and relevant investigations resulted in making a diagnosis in most of the patients.

**SUMMARY:**

126 patients admitted to Government General Hospital, Vijayawada with complaints of fever in an one year period are studied.

* Males outnumbered females. (M:F-1.8:1)

* Infections (89%) are the most common causes of fever in the patients studied.

* Among infections, majority of the cases were of malaria (23.2%).

* Among 112 patients with infections, 13 were co infected with HIV (11.6%).

* Neoplasms, connective tissue diseases and miscellaneous conditions occupy a minor part in the study.

* 6 patients remained undiagnosed but improved.

* Complete history, physical examination and relevant investigations are required for the diagnosis of etiology of fever.

* Apart from routine investigations, serological tests like ELISA and minor procedures like FNAC and lumbar puncture were of immense help in the evaluation of fevers.

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Volume 1, Issue 2; July-August 2018; Page No. 122-130