

A New Modality in the Armamentarium for Evaluation Of Fever of Unknown  
Origin: The role of 18 FDG - PET- CT

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INTRODUCTION

- 18F- FDG PET CT is a non-invasive nuclear medicine mo dality utilized for the purpose of identifying the occult disease foci in patients presenting as fever of unknown origin (FUO).
- FDG accumulates in tissues with a high rate of glycolysis, which occurs in malignant cells, activated leukocytes thereby permitting the imaging of acute and chronic inflammatory processes.

Primary objective:

To evaluate the clinical and diagnostic significance of FDG PET-CT in a patient with FUO.

Secondary objective:

To perform statistical analysis for the prediction value of PET-CT in arriving at a diagnosis in FUO.

MATERIALS & METHODS

- Study Design:** Prospective cohort study
  - Study group:** Patients admitted in Aster Medcity, Kochi.
  - Study duration:** two years
  - Sample size:** 77
- Inclusion criteria:** Patients above the age of 18 years fulfilling the criteria for FUO:
- 1) Fever more than 38.3C/101 F on at least two occasions.
  - 2) Illness duration of more than 3 weeks.
  - 3) No known immunocompromised state
  - 4) Diagnosis that remains unknown after a thorough history taking, physical examination and intense inpatient investigations.

Exclusion criteria:

- 1) Patients below the age of 18 years.
- 2) Pregnant ladies
- 3) Patients known to have Malignancy and HIV infection.
- 4) Patients who had undergone surgery in the past 3 months.

**Data collection method:** Patient interview and Electronic medical records.

RESULT

- 77 eligible patients; 8 have lost to follow up.
- Mean age - 50.1 ± 16.45 years- 52 male and 25 female
- Among the 69 patients - patients (86.9%) had FDG uptake and 9 patients (11.7%) had normal study.

Table 1: Table showing TP, FP, FN, TN, Sensitivity, Specificity, PPV, and NPV of PET-CT in FUO.

|                 | Diagnosed | Undiagnosed | TOTAL |
|-----------------|-----------|-------------|-------|
| PET Findings    | 52 (TP)   | 8 (FP)      | 60    |
| No PET Findings | 5 (FN)    | 4 (TN)      | 9     |
| TOTAL           | 57        | 12          | 69    |

According to Fisher’s Exact Test, P value obtained is 0.095

Sensitivity : 91.2%      Specificity: 33.3%  
PPV – Positive predictive value – 86.6%,  
NPV – Negative predictive value – 44.4%

TP – True positive - 52, FP – False positive - 8,  
FN – False negative – 5 , TN – True negative - 4

Table 2: Distribution of type of disease diagnosed in each age group

| Age (in years)              | 18-29 | 30-49 | 50-69 | ≥ 70 | TOTAL |
|-----------------------------|-------|-------|-------|------|-------|
| Infection                   | 1     | 8     | 11    | 0    | 20    |
| Non-infectious inflammation | 4     | 5     | 8     | 3    | 20    |
| Malignancy                  | 1     | 6     | 10    | 0    | 17    |
| True negative PET CT        | 1     | 1     | 2     | 0    | 4     |
| No PET CT findings          | 1     | 1     | 5     | 1    | 8     |
| Lost to follow up           | 0     | 3     | 1     | 4    | 8     |
| TOTAL                       | 8     | 24    | 37    | 8    | 77    |

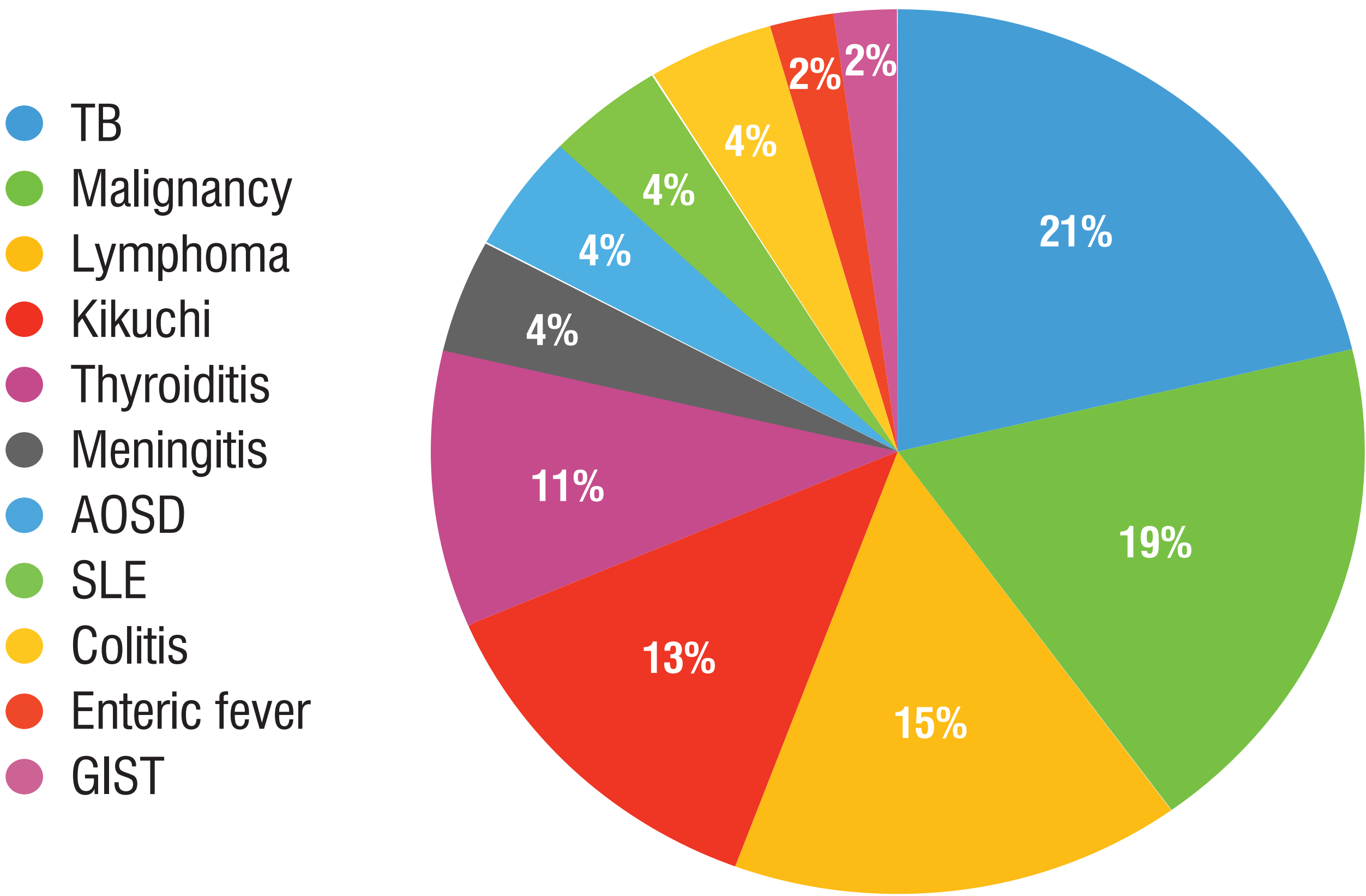


Figure 1: Type of distribution of diseases diagnosed in patients presented with FUO

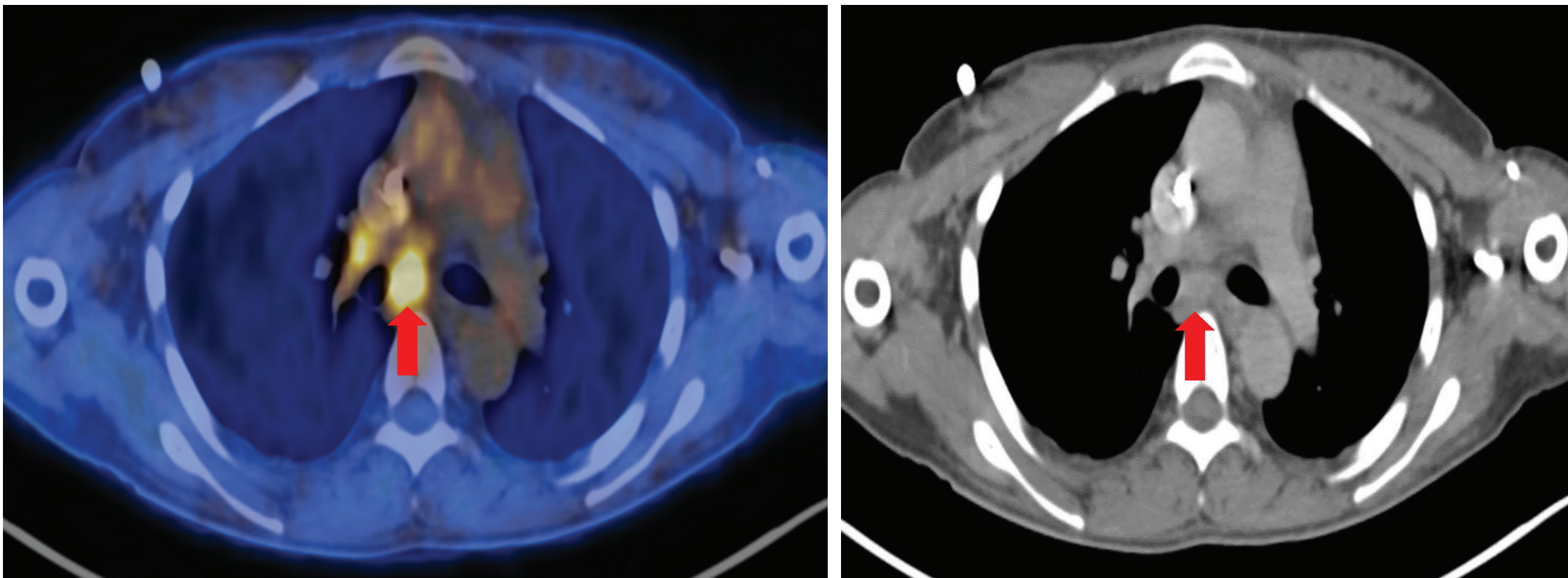


Figure 2: Fused PETCT image showing FDG avid subcarinal node – diagnosed to be tuberculosis

DISCUSSION & CONCLUSION

- The study proved PET-CT to be a valuable tool in diagnosing or ruling out a disease foci in 81.2% of the cases.
- The study demonstrated that FDG PET-CT exhibited a good PPV and high sensitivity.
- The early utilization of PET-CT in the diagnostic process of PUO offers the advantage of avoiding unnecessary multiple imaging procedures, ultimately leading to re duced hospital stays and decreased healthcare expenditure.
- This modality can identify diverse etiological factors contributing to FUO, including infections, inflammatory conditions, and malignant diseases.
- In 17.6% of patients, no specific cause could be identified for FUO, and the condition resolved spontaneously
- Previous use of antibiotics, steroids, and anti-inflammatory drugs can lead to decreased uptake of 18F FDG in a pathological area due to transient suppressed disease activity.