FEVER AND FEVER OF UNKNOWN ORIGIN

Dr. William Lockwood
NORMAL TEMPERATURE – 98.6°

• Defined 1800’s
• Carl Reinhold August Wunderlich
• Took temps in 25,000 adults
FEVER

- Presence of temperature higher than normal
- Normal temperature – 96.8°F – 99.9°F (36.0° – 37.7°C)
- Varies during day usually 1.0° – 2.0°F
CAUSES OF FEVER

- Infection
- Tumors
- Drugs
- Anesthesia
- Hyperthermia
- Central Fever
- Connective Tissue Disease
- Pancreatitis
- Thrombosis – DVT
- Pulmonary Emboli
- Heat Stroke
- Malignant Hyperthermia
CONDITIONS WHERE FEVER IS LACKING

- Neonates
- Elderly
- Uremia
- Steroids
- Immunocompromised
- Malnutrition
- Antipyretics
FEVER – SUBGROUPS

1. Short term (acute) fever
2. Long term – FUO
3. Hospitalized patient with fever
4. Neutropenic fever
5. Fever in AIDS patient
SHORT TERM (ACUTE) FEVER

- Can be caused by anything
- Most commonly viral or bacterial process
NOSOCOMIAL FEVER – CAUSES

- UTI
- BSI
- Pneumonia
- Wound infection
- Drugs
- Anesthesia
- Thrombosis/Emboli
NEUTROPENIC FEVER

• Fever occurring during the neutropenic phase following chemotherapy
• Neutropenia – neutrophil count < 1,000
• Absolute neutrophil count (ANC) = total WBC × % neutrophils
• Risk of infection increases as the neutropenia worsens
• Most likely infection with risk of mortality are GNR
• Multiple studies show improved mortality if patients with neutropenic fevers are admitted and covered with antipseudomonas coverage
Fuo

- Original definition – Petersdorf and Beeson – 1961
  1. Fever of 3 weeks duration
  2. Fever greater than 101°F – 38.3°C
  3. No diagnosis after 1 week in hospital
CAUSES OF FUO – MAJOR STUDIES

- Petersdorf and Beeson – 1961
- Larson ET AL 1982
- Knockaert ET AL 1992
- Hirschmann – 1997
FUO – REVISED DEFINITION

• Must satisfy requirements 1 and 2 and
• No diagnosis after 1 week investigation – Petersdorf or
• No diagnosis after 3 outpatient or 3 days hospitalization Durack and Street
CAUSES OF FUO

• Infections – 23-36%
• Neoplasms – 7-31%
• Collagen Vascular – 9-20%
• Miscellaneous – 17-24%
• Undiagnosed – 7-26%
FUO – INFECTIONS

- Tuberculosis
- Intraabdominal abscess
- Hepatobiliary infection
- Endocarditis
- Cytomegalovirus
- Cirrhosis
- Bacteremia
- Pyelonephritis

- Psittacosis
- Brucellosis
- Malaria
- Gonococcal urethritis
- Sinusitis
- Candidiasis
- Amebic hepatitis
- osteomyelitis
FUO – OTHER INFECTIONS

• Legionnaires
• Toxoplasmosis
• Cat Scratch Disease
• Q Fever
• Tularemia
• Leptospirosis
FUO – TUMORS/NEOPLAMS

- Lymphoma
- Leukemia
- Myelodysplastic syndromes
- Carcinomatosis
- Solid tumors
  - Myeloma
  - Hypernephroma
  - Pancreatic
  - Sarcoma
  - Hepatoma
FUO – COLLAGEN VASCULAR DISEASE

- Lupus
- Arteritis
- Stills Disease
- Rheumatoid Arthritis
- Polymyalgia rheumatica
- Wegners granulomatosis
- Behcet’s Syndrome
FUO – MISCELLANEOUS

- Sarcoidosis
- Factitious
- Familiar Mediterranean Fever
- Pericarditis
- Granulomatous Hepatitis
- Thrombosis/PE
- Adrenal insufficiency
- Drug fever
- Thyroiditis
- Crohn’s Disease
- Myxoma
- Silicosis
- Erythema multiforme
- Rheumatic Fever
- Alcoholic hepatitis
DRUGS CAUSING FEVER

- Sulfa
- PCN
- Nitrofurantoin
- Vancomycin
- H2 Blockers
- Phenytoin
- Barbituates

- NSAIDS
- ASA
- Hydralazine
- Methyldopa
- Quinidine
- Procainamide
FUO

- Undiagnosed FUO has fallen to 10%
- Undiagnosed FUO – generally does well
- Collagen vascular disease has increased
- TB decreased
- Abdominal abscess has decreased 2° to CT
- Endocarditis – has decreased 2° to better blood cultures
FUO – INITIAL WORKUP

- History
- Physical exam (repeated)
- CBC, CMP
- Hepatitis serologies
- ANA
- UA
- CXR
FUO – EXTENDED WORKUP

• PPD / Quantiferon
• ESR
• CRP
• Stool studies
• Pap smear
• Ace level
• Rheumatoid factor
FUO – EXTENDED WORKUP

TITERS

- EBV
- CMV
- HIV
- Fungal
- Legionnaires testing
- Chlamydia

- Toxoplasmosis
- Q Fever
- Brucellosis
- Tularemia
- Bartonella
FUO – RADIOLOGIC STUDIES

- CXR
- IVP
- CT – chest, abdominal, pelvis
- Bone scan
- MRI
- WBC scan
- Ultrasound
- Echocardiogram
- Mammograms
FUO – EXTENDED WORKUP

BIOPSIES

- Lymph nodes
- Skin
- Temporal artery
- Bone marrow
- Liver
ANTIBIOTICS FOR FEVER

• Best not to start antibiotics until infection identified
• Exception – patients with sepsis or deteriorating
• If site of infection identified – can at least make prediction of likely organisms, thus improving empiric choice