

PYREXIA

Pyrexia, also known as fever, is an increase in the body temperature of an individual beyond the normal range. This increase in temperature is usually considered dangerous, but it is a natural defensive mechanism of the body to fight against infections.

Pyrexia is usually associated with other symptoms such as lethargy, headache, cough, and cold. A mild increase in body temperature can be relieved by over-the-counter medications. A sudden and higher increase in the body temperature beyond the normal range should be treated medically as it could be due to some major illnesses such as a brain haemorrhage or cancer.

Causes of Pyrexia:

Causes of pyrexia may be infectious or non-infectious. Some of the common reasons of pyrexia are listed here:

Infectious Causes:

- Lower respiratory tract infections like bronchitis (inflammation of the air tubules that carry blood in and out of the lungs)
- A bacterial lung infection called tuberculosis
- Complicated urinary tract infections
- Bone infections like Osteomyelitis
- A bacterial infection of the cardiac tissue called endocarditis
- Viral infections like HIV (Human-Immunodeficiency syndrome) and Cytomegalovirus

Non-infectious Causes:

- Neurological conditions like brain fever or haemorrhages
- Malignant conditions like Leukaemia and renal cell carcinoma
- Reactions to drugs
- Bowel or bladder related problems
- Reactions to blood transfusion

Signs and Symptoms Associated with Fever:

Fever is clinically manifested as additional signs and symptoms such as:

- Shivering or chills
- Headache
- Generalised body pains and weakness
- Irritability
- Dehydration
- Loss of appetite

- Joint pains
- Sweating

Children in the age of 6 months to 5 years may get febrile seizures (which is marked by the loss of consciousness, stiffening, jerking and fainting)

Risk factors for Fever:

People with the following conditions are at a higher risk for developing fever:

- Bronchitis
- Sinusitis
- Rheumatoid arthritis
- Allergic rhinitis (hay fever)

Common Complications of Fever:

High-grade fever (>104 F) for a prolonged period may give rise to complications such as:

- Seizures
- Brain damage
- Coma
- Death

People with high-grade fever and those with fever since prolonged times require immediate medical treatment to prevent the development of complications due to a weakened immune system.

Diagnosis of Fever:

The doctors take a detailed history from the patient about the duration of fever and the associated symptoms such as chills, headache and body pains.

Doctors also physically examine the:

- **Temperature:** To check for the level of temperature rise
- **Eyes:** To check for any redness or paleness
- **Pulse:** To test for the heart rate
- **Blood pressure:** To check for changes in the blood pressure

Based on the history taken from the patient, the doctors recommend a Complete blood count (CBC), Urine test and a chest X-ray to determine the exact cause of pyrexia.

Pathophysiology

- The initiation of fever begins
- when exogenous or endogenous stimuli are presented to specialized host cells, principally monocytes and macrophages, they will stimulate the synthesis and release of various pyrogenic cytokines including:

1)interleukin-1, interleukin-6

2)TNF- α , and

3)IFN- γ .

1) Exogenous stimuli: stimuli from outside the host. Eg: microorganism, their products, or toxins and it is called Endotoxin

- Endotoxin: lipopolysaccharide (LPS). LPS: is found in the outer membrane of all gram-negative organism
- Action:
 - 1) through stimulation of monocytes and macrophages
 - 2) direct on endothelial cell of the brain to produce fever

2) Endogenous pyrogens:

- Polypeptides that are produced by the body (by monocytes and macrophages) in response to stimuli that is usually triggered by infection or inflammation stimuli

Pyrogens: Substances that cause fever are called pyrogens

- Pyrogens are a group of chemically diverse substances that cause fever and shock in severe cases. The most important pyrogenic substances in pharmaceutical industry are bacterial endotoxins. Bacterial endotoxins are part of the cell wall of gram-negative bacteria.

Cytokines: Cytokines are regulatory polypeptides that are produced by monocytes / macrophages, lymphocytes, endothelial and epithelial cell and hepatocytes.

The most important ones are:

- Interleukin 1 α and 1 β -: The most pyrogenic
- Tumor necrosis factor α
- Interferon
- Interleukin 6 - The least pyrogenic

Treatment of Pyrexia:

Pharmacological management

The following methods can treat pyrexia:

- **Medications:** The medications should be used at the exact doses as recommended by the physician as higher doses may damage the liver or kidney.
- **Antibiotics:** These drugs are recommended if the doctor suspects that the fever is caused by some bacterial infections in the bladder or bowel.

- **Antiviral drugs:** These medicines are used if the doctors diagnose that the fever is caused by viral infections.
- **Rest:** The patient should take adequate rest.
- **Fluids:** Adequate fluids along with regular supplements should be taken to prevent dehydration.

Patients admitted with very high fever and weakness are immediately put on intravenous vitamin supplements or medications to prevent excessive loss of salts and minerals from the body.

Foods That Can Help with Pyrexia

- Soup - Apart from providing vital nutrients, it also helps to hydrate and improves electrolytic balance.
- Berries – Berries are high in vitamin C, fibre, antioxidants and anthocyanins. Berries like strawberry, cranberry and blueberry. The anthocyanins are highly beneficial against respiratory infections while simultaneously the immune system.
- Chicken Soup – The classic chicken soup has enormous benefits to regain health during or after pyrexia. Chicken soup contains proteins and liquids, to meet the higher energy requirements and keep hydrated.

First-aid for Pyrexia:

Fever itself is not a disease but is a sign that alerts you about some underlying infection or health condition. The following first-aid measures are helpful while treating fever:

- Drink plenty of fluids.
- Use blankets to control shivering.
- Rub the palms and soles (the peripheral parts of the body) to increase the internal temperature of the body.
- Use over-the-counter medications like Paracetamol to reduce the body temperatures, but only to a limited dose and seek doctors' advice before using them for a prolonged time.

Infants lesser than 6 months are to be properly checked for the associated symptoms of fever such as stiff neck, continuous crying, difficulty in breathing and rash on the body; on the incidence of any of these signs seek medical help.

Prevention of Pyrexia:

The following measures can prevent pyrexia:

- Maintaining a proper self-hygiene
- Washing hands regularly before eating
- Using hand sanitisers where there is no access to water

- Covering the nose and mouth when travelling in public transport to prevent the entry of disease-causing organisms into the body
- Sharing plates, glasses or cups along with other people must be avoided

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