

Hyperpyrexia in Children and its Homoeopathic Approach

Mohitesh Singh Jaswal

Abstract: *Hyperpyrexia, defined as a core body temperature exceeding 41°C (105.8°F), represents a critical elevation beyond the febrile range. This article explores the physiological mechanisms underlying temperature regulation, differentiating between hyperthermia and fever. The role of the hypothalamus in both heat conservation and dissipation is emphasized. It explores the classification of fever, common etiologies, and clinical manifestations. The article further discusses the specific challenges of fever in children, including diagnostic considerations, management strategies, and potential complications such as febrile seizures and dehydration. A overview of the homeopathic perspective on fever, including miasmatic concepts and key remedies.*

Keywords: hyperpyrexia, fever, temperature regulation, homoeopathy, febrile seizures

1. Introduction to hyperpyrexia

History of pyrexia

- In 1976 McCarthy and Dolan used the term “hyperpyrexia” in relationship to a temperature of 41.1 C (106 F).
- They found it to be associated with an increased occurrence of serious bacterial infections, particularly meningitis.
- This, was prior to the widespread use of vaccinations against HiB and S. Pneumonia.

Mechanism of Temperature Regulation

When body temperature increases, blood temperature also increases. When blood with increased temperature passes through hypothalamus, it stimulates the thermoreceptors present in the heat loss center in preoptic nucleus.

Now, the heat loss center brings the temperature back to normal by two mechanisms:

- 1) Promotion of heat loss
- 2) Prevention of heat production

1) Promotion of heat loss

When body temperature increases, heat loss center promotes heat loss from the body by two ways:

- a) By increasing the secretion of sweat.
- b) By inhibiting sympathetic centers in posterior hypothalamus: This causes cutaneous vaso - dilatation. Now, the blood flow through skin increases causing excess sweating.

2) Prevention of heat production

Heat loss center prevents heat production in the body by inhibiting mechanisms involved in heat production, such as shivering and chemical (metabolic) reactions.

Now when the body temperature decreases, it is brought back to normal by two mechanisms:

a) Heat Conservation

- **Vasoconstriction:** Blood vessels near the skin narrow to reduce heat loss.

b) Heat Production

- **Shivering:** Involuntary muscle contractions generate heat.
- **Metabolic Increase:** Hormones like adrenaline and thyroxine boost metabolism, increasing heat production. This process is termed chemical thermogenesis.

When the body is cold, the brain sends a message to the pituitary gland (and then hypothalamus) secretes tropin - releasing hormone. It causes release of thyroid - stimulating hormone. It in increases release of thyroxine from thyroid Thyroxine accelerates the metabolic activities the body and this increases heat production.

Applied Physiology

Hyperthermia - Fever

Elevation of body temperature above the set point is called hyperthermia, fever or pyrexia. Fever is a body's natural response to fight infection. It's not a disease itself but a signs that something is wrong. While it can be uncomfortable, fever often helps the body to heal.

Classification of Fever

Fever is classified into three categories:

- 1) Low - grade fever: When the body temperature rises to 38°C to 39°C, (100.4°F to 102.2 F)
- 2) Moderate - grade fever: When the temperature rises to 39°C to 40°C (102.2°F to 104°F).
- 3) High - grade fever: When the temperature rises above 40°C to 42°C (104°F to 107.6°F). s

Hyperpyrexia

Hyperpyrexia is the rise in body temperature beyond 42°C (107.6 F). Hyperpyrexia results in damage of body tissues. Further increase in temperature becomes life threatening.

Causes of Fever

- 1) Infection: Certain substances (pyrogens) released from bacteria or parasites affect the heat - regulating
- 2) system in hypothalamus, resulting in the production of excess heat and fever.
- 3) Hyperthyroidism: Increased basal metabolic rate during hyperthyroidism causes fever
- 4) Brain lesions: When lesion involves temperature - regulating centers, fever occurs.
- 5) Diabetes insipidus: In this condition, fever occurs without any apparent cause.

Signs and Symp

- 1) Headache
- 2) Sweating
- 3) Shivering
- 4) Muscle pain

Volume 13 Issue 7, July 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

www.ijsr.net

- 5) Dehydration
- 6) Loss of appetite
- 7) General weakness.

Hyperpyrexia may result in:

- 1) Confusion
- 2) Hallucinations
- 3) Irritability
- 4) Convulsions.

Fever in children

Children are considered to have a fever if they have a body temperature of 38.5°C (101.3°F) or more, and babies under three months old are already considered to have a fever at a body temperature of 38.0°C (100.4°F) or more.

What is pyrexia? & how to define pyrexia.

Fever is a physiologic response characterized by an elevation of body temperature above normal daily variation. Fever is the one of the most common cause for medical consultation in children

Symptoms

Typical signs include a red face, tired - looking or glazed eyes and otherwise pale skin. A hot forehead or neck can also be a sign of fever. Some children lose their appetite or cry a lot.

When its important to take the child to see a doctor if

- their temperature is above 39°C (102.2°F) or a baby under three months old has a temperature above 38°C (100.4°F),
- the fever comes and goes,
- the fever lasts longer than three days,
- they have a febrile seizure,
- they have a stiff neck, are unresponsive, restless or confused,
- they vomit, have diarrhea or pain in their belly,
- they have a skin rash,
- they refuse to drink over a long period of time or
- their condition has worsened since the last visit to the doctor.

Possible causes of fever include the following:

- Viruses or bacteria: for e. g. a common cold, middle ear infection, urinary tract infection (UTI) or gastroenteritis. Or typical childhood diseases such as mumps, measles, German measles (rubella), scarlet fever, chickenpox and sixth disease (roseola).
- A vaccination: because the child's immune system is developing antibodies to fight the germs that the vaccine aims to protect them from.
- Dehydration: The child has a fever because they haven't had enough to drink and their body is dehydrated. This kind of fever due to dehydration can also be caused by severe vomiting and diarrhea.
- In rare cases: serious illnesses such as pneumonia, meningitis, appendicitis or an infection of the joints or bone marrow.

However, fevers can also be caused by non - infectious conditions like immunizations or inflammatory diseases.

A fever in children is defined as:

- **38.5°C (101.3°F) or higher** for children over 3 months old.
- **38.0°C (100.4°F) or higher** for babies under 3 months old.

Taking a Child's Temperature: Choosing the right method for measuring your child's temperature is crucial. Here's some of common methods:

- **Rectal:** This is considered the most accurate method and is recommended for children under 4 years old.
- **Ear or Forehead Thermometers:** These offer a convenient and relatively accurate option.
- **Mouth or Armpit Thermometers:** While these methods can be used, they are generally less accurate, especially for children under 5.

When to Seek Medical Attention: A high fever (above 41°C or 105.8°F) is always a cause for concern and requires immediate medical evaluation. Additionally, specific signs and symptoms accompanying the fever can indicate a more serious infection. These include:

- **Pallor:** Pale or grayish skin tone.
- **Lethargy:** Excessive tiredness or listlessness.
- **Weak Cry:** A high - pitched, weak cry in infants.
- **Rapid Breathing (Tachypnea):** Breathing rate faster than normal for the child's age.
- **Fast Heart Rate (Tachycardia):** Heartbeat faster than normal for the child's age.
- **Reduced Urination:** Less frequent urination than usual.
- **Bulging Fontanelle (Infants):** A bulging soft spot on the top of a baby's head.
- **Rigors (Shivering):** Intense shivering episodes.

Evaluation and Diagnosis:

- **Infants under 3 months:** Due to the higher risk of severe bacterial infections in this age group, it's crucial to see a doctor immediately for any fever.
- **Older Children:** If your child has a high fever or concerning signs alongside the fever, a doctor's visit is essential. a physical examination and may recommend tests like urinalysis, complete blood count (CBC), blood cultures, and chest X - rays (if necessary) to determine the underlying cause of the fever.

Treatment and Management:

The primary focus during a fever is to ensure the child's comfort. This may involve measures like:

- **Light clothing:** To prevent overheating.
- **Lukewarm baths or sponging:** To help bring down the temperature slightly.
- **Plenty of fluids:** To prevent dehydration.

Additional Considerations:

- **Children with Disabilities:** Children with cerebral palsy, cognitive impairment, or other disabilities may present a unique challenge during a fever. These children may have difficulty communicating their symptoms, requiring careful evaluation by the doctor.

While a fever in itself might not be a cause for immediate alarm, it's important to be aware of the signs that could indicate a more serious condition.

Complications of Fever

Seizures

One of the most concerning complications associated with fever is seizures. Febrile seizures, triggered by a rapid rise in temperature, are most common in children between 6 months and 5 years. While alarming, most febrile seizures are harmless and don't cause long-term issues. However, it's essential to monitor the child closely and seek medical attention if the seizure lasts longer than 5 minutes or if multiple seizures occur.

Dehydration

Fever can increase fluid loss through sweating and increased respiration. Coupled with decreased fluid intake due to illness, dehydration can become a significant concern, especially in young children. Signs of dehydration include dry mouth, reduced urination, lethargy, and sunken eyes. Severe dehydration requires immediate medical attention.

Hallucinations and Delirium

In rare cases, high fever can lead to hallucinations or delirium, particularly in young children. These episodes can be frightening for both the child and the caregiver, often involving vivid, dreamlike experiences. While alarming, these episodes are usually temporary and resolve once the fever subsides.

Other Potential Complications

While less common, fever can make existing medical conditions or contribute to the development of other problems. These may include:

- **Heatstroke:** In extreme cases, very high fever can lead to heatstroke, a life-threatening condition.
- **Bacterial Infections:** While fever often indicates a viral infection, it's essential to be aware of the possibility of underlying bacterial infections, such as meningitis or pneumonia.
- **Febrile Seizures and Epilepsy:** While most children who experience febrile seizures develop normally, there is a slightly increased risk of epilepsy later in life.

Miasmatic approach in fever

- **Miasm:** miasm refers to the dynamic disease producing power which stain and pollutes human organism with unhealthy tendencies and thus become the producer of different types disease.
- Miasm have two types— viz.1 acute miasm and 2. Chronic miasm
- **Acute miasm** (aphorism no.73) —acute miasm is a dynamic disease producing power which causes acute specific infectious epidemic disease having almost fixed manifestation.
- The acute miasm are two types 1 recurring miasm 2. Non recurring miasm
- **Recurring type**—those types of acute miasm that recur in the same manner more than once in life time of a particular person. Example: dengue, chikengunea, swine flue cholera, yellow fever, plague etc.
- **Non recurring acute miasm**— - this is also called fixed miasm these types of acute miasm are those which attack a person only once in life time and called non recurrent

or fixed miasm. Example. Smallpox, whooping cough, etc.

Characteristics of acute miasms

Acute miasms refer to the dynamic disease producing power which causes epidemic type of acute disease. It has distinct period of progress and decline which if left to itself terminates in moderate period of time in death or recovery.

Chronic miasm are the originator of acute miasms. if there is no chronic miasm there would have no acute miasm (and chronic miasm are psora, syphilis, sycosis.)

It can be said that if 100% of all disease is miasmatic, then 85% is due to the primary miasm called Psora. The remaining 15% of all disease either syphilitic or sycotic, being derived from suppressed Syphilis or suppressed Gonorrhoea. So, fever condition mostly come under psoric miasm

Differential Diagnoses

- Neonatal Sepsis
- Pediatric Escherichia Coli Infections
- Pediatric Meningitis and Encephalitis
- Pediatric Pneumococcal Bacteremia
- Pediatric Urinary Tract Infection
- Group B Streptococcus (GBS) Infections

Homoeopathic remedies

Aconite

Cold stage most marked; cold sweat and icy coldness of face; coldness and heat alternate; evening chilliness soon after going to bed; cold waves pass through him. Thirst and restlessness always present. Chill if uncovered or touched; dry heat, red face. Most preferable fever remedy with mental anguish, restlessness etc. sweat drenching, on parts lain on; reliving all symptom.

Arsenic album

High temperature; periodically marked with adynamic; septic fever; intermittent; paroxysms incomplete; with marked exhaustion; hay fever. Cold sweats. Delirium state worse after midnight; great restlessness; great heat about 3. A. m.

Baptisia

chill, with rheumatic pains and soreness all over body. Heat all over, with occasional chills. Chill about 11 a. m. Typhus fever; Shipboard fever.

Belladonna

Pulse - ordinary quick, often full, hard and tense, but sometimes also small and soft; seldom slow, and then it is full. Throbbing carotid and temporal arteries. Violent beating of the arteries. Chill: in evening, especially on extremities, more on arms, with heat on head. Internal, with external burning heat. Alternating with heat. Evening shaking chill.

Bryonia

the patient may be restless and toss about, but is always made worse thereby. There is intense headache, dull,

stupefying with a sensation as if the head would burst at the temples; sharp pains over the eyes, faintness on rising up, dry mouth and a tongue coated white in the middle. Cold, chilly sensations predominate in fevers calling for Bryonia, and there is much thirst for large drinks of water at rather infrequent intervals. The fever of Bryonia is unmarked by the violence, acuteness and general storm of Aconite or the decomposition and great debility of the acids. It is neither synochal nor so markedly asthenic in character, it is between the two and is dependent upon local affections, state of stomach, liver, chest, etc.

Natrum mur

Chill stage between 9 and 11 a. m heat; violent thirst, increases with fever. Fever blisters. Coldness of the body, and continued chilliness very marked. Hydremia (blood disorder characterized by excessive fluid volume with or without reduction of blood plasma volume.) in chronic malarial state with weakness, constipation, loss of appetite, etc. sweats on exertion.

Rhus tox – chill stage: Chill starts in one leg, usually thigh, between the shoulders or over one scapula. Scapula. Chill starts at around 7 P. M. patient shivers with great chilliness and feels as though dashed with ice water. Least movement like eating and drinking aggravate his chill but he still moves about for movement eases his pain.

Heat stage: The blood that was so long running like ice water feels like boiling hot. Headache not attended by teasing cough. Urticaria breaks out instead of cough with violent itching and great thirst. Intense restlessness and the patient is continuously changes his position but finds rest nowhere.

Sweat: After the heat stage the patient breaks out in to profuse odourless perspiration.

Typhoid fever – Rhus Tox has characteristic broad and flabby tongue with imprint of teeth. It is covered with brownish tenacious mucus. At other times it is dry, cracked with red edges ad triangular red tip.

Scarlet fever: Patient becomes very restless and drowsy, fauces look dark red and oedematous. Cervical glands too are swollen. Swelling may even extend to the parotid glands. Glands of axilla are especially affected by Rhus Tox.

Gelsemium

Wants to be held, because he shakes (trembles). During fever pulse is slow, full, soft, compressible. Chilliness up and down back. Heat and sweat stages of fever, long and exhausting. Dumb - ague, with much muscular soreness, great prostration, and violent headache. Nervous chills. Biliary remittent fever. With stupor, dizziness, faintness; thirstless, prostrated. Chill, without thirst, along spine; wave like, extending upward from sacrum to occiput.

Sulphur

When the skin is dry and hot and there is no sweat; the fever seems to burn the patient up, the tongue is dry and red and the patient at first is sleepless and restless, but soon becomes drowsy. There are no blood changes.

Ferrum phos

In all early stage of fever; face flushed; pulse soft; no indication of restlessness.

China - long lasting suppurative fevers; cheeks red; patient excessively nervous, not in proportion to his wasting strength, can scarcely raise his head from pillow; diarrhea; night sweats. Suppuration of lungs; particularly in drunkards, with foeted breath; skin dry, flaccid, loss of appetite with weak digestion and flatulency after eating.

References

- [1] Sembulingam, K., & Sembulingam, P. (2012). Essentials of Medical Physiology. JP Medical Ltd
- [2] Editors, P. M. (1995). The Doctors Book of Home Remedies for Children.
- [3] Allen, H. C. (2002). Allens Keynotes Rearranged & Classified. B. Jain Publishers

Author Profile

Dr. Mohitesh Singh Jaswal, P. G. student of Sri Guru Nanak Dev Homoeopathic College & Hospital, Ludhiana in subject of Repertory session 2021 – 2022.