Botanical Medicines in the Stages of Fever

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Historical view of fever

- Hippocratic corpus
- Thomsonian/Physiomedicalist
- Nature Cure
- Allopathic from Galen to the present

In the older literature of natural medicine, the discussion of fever and inflammation defines the school as vitalist/natural vs allopathic
Fever

• A **beneficial** rise in the body metabolism and temperature.
• The thermogenic set point is raised.
• Increased manufacture of antibodies and white blood cells -- Antibody production is increased about 20-fold.
• Retards growth and reproduction of bacteria and virus
• Aids body’s acute phase reaction
• Increased circulation to surface defenses
• Increased elimination.
Recent review of pediatric fever

- “Fever . . . is not the primary illness but is a physiologic mechanism that has beneficial effects in fighting infection.”
- “There is no evidence that fever itself worsens the course of an illness or that it causes long-term neurologic complications.”
- “The primary goal of treating the febrile child should be to improve the child's overall comfort rather than focus on the normalization of body temperature.”
- “. . . monitoring activity, observing for signs of serious illness, encouraging appropriate fluid intake . . .” are appropriate measures.

“Studies of health care workers, including physicians, have revealed that most believe that the risk of heat-related adverse outcomes is increased with temperatures above 40°C (104°F), although this belief is not justified.”
Fever is not hyperthermia

- **Hyperthermia** (heat stroke) has no elevation of set point, but is a failure of compensatory mechanisms, at temperatures from 105.8 to 107.6 damage from hyperthermia occurs.
- **Fever** has elevated set point with compensatory cooling mechanisms.
- “For practical purposes except in rare instances, the human oral temperature cannot rise above 106 degrees” *Harrison’s Internal Medicine*
- **Hyperpyrexia** fever above 106 degrees F. “08% of pediatric emergency center admissions) do not require any more special evaluation by the physician than any febrile child with a temperature below 106.” No more likely to indicate bacterial than viral infection.
Risks of fever

- While fever itself is not pathological, it may be the sign of non-infectious pathologies that may be serious.

- The chief concern for higher fevers is \textit{dehydration} or \textit{metabolic exhaustion} in elderly or debilitated patients.

- High fever in cardiac patients may destabilize arterial plaques or cause stroke in patients with cerebral arterial disease.
Normal temperature

- The supposed average of 98.6 was based on inaccurate data. *
- Meta-analysis of measurements in healthy subject from 1935 to 1999, showed a median normal oral temperature of 97.7 **
- Typical fluctuation during the day of 0.9 degrees F, from 6AM to 4PM peak.
- Average among elders is 96.8 with a reduced diurnal rise of .5 degrees


Range of normal temperatures

- Oral 91.8 - 100.8 (Male 96.3 – 99.9)
- Rectal 94 - 100
- Tympanic 95.7 - 100
- Axial 95.9 - 100.4

Fever range

- Range 98.9 at 6AM to 99.9 at 6PM are the upper range of normal in healthy adults under age 40.
- Lower limits should be considered in elders, for example 98.0 AM to 98.5 PM may indicate a febrile response in an elder.
• 98 - 99 degrees. Influenza virus dies.
• 99.5 The digestive system shuts down.
• 104 degrees. Gonococcus is killed. Polio virus replication is reduced by a factor of 250. Normal temperature may reach 104 degrees under vigorous exercise.
• 106 degrees. Pneumococcus dies. Spirochetes die. (Malaria traditionally induced to fight syphilus)
• 106-110 malignant cells are selectively killed
• 108 brain damage may occur due to denaturation of proteins.
• 110 Human cells begin to die.
Antipyretic therapy
Aspirin and NSAID may promote infection

- Animal trials: Rabbits infected with Pasteurella had a 29% mortality rate. One group had their fever lowered by 1.5 degrees with salicylates, and had 100% mortality. Salicylates alone in uninfected rabbits caused no mortality. Treated rabbits had a lower white blood cell count than their infected but untreated counterparts, and their lung and liver bacterial counts were higher.


Influenza mortality increased

- Animal trials: on meta-analysis of 8 trials, the use of aspirin, acetaminophen, or diclofenac increased mortality from experimental influenza infection by 34%.

Pneumonia mortality

- Animal trials: In a meta-analysis of 3 studies, antipyretic therapy in pneumonia doubled mortality rate in animals. The *Pneumococcus* bacterium is temperature sensitive.

NSAID and interferon response

- NSAID inhibit cyclo-oxygenase, which is essential for the production of the interferon response to viral infection, the primary defense against infection.

Antibody response in humans

- Human trials of experimental rhinovirus infection treated with salicylates and NSAID. Lowering the fever with aspirin and acetaminophen suppressed antibody response and increased the severity of subjective symptoms. Ibuprofen had a strong similar trend (worse than placebo on every measure) but which did not reach statistical significance.

Duration of illness

- Patients with experimental infection with Influenza or Shigella were given aspirin or acetaminophen.
- “There was a striking correlation between antipyretic therapy and duration of illness in subjects infected with influenza A and Shigella sonnei”

Aspirin in the 1918 influenza pandemic

- May have been responsible for a large proportion of excess mortality in the U.S.
- Standard medical regimen in civilian and military population was 8.0-31.2 g per day, levels which today are known to be frankly toxic.
- This dose would result in an expected 33% of subjects developing hyperventilation and 3% pulmonary edema.
- Mortality rate in the U.S. from the pandemic was about 3%.
- Antipyretic **suppression of antiviral mechanisms**, in addition to adverse effects of **toxicity**, contributed to the severity of the pandemic.

Ill effects of chronic suppression

- “Post viral syndrome”
- Collapse of vital structures
- Chronic fatigue
- “Lake Tahoe syndrome” and chronic fatigue.
Stages of fever

1. Set point elevated, cold and chills predominate
2. Set point peak, elevated pulse and temperature
3. Fluctuating set-point, cycling fever, sweating, and chills
4. Crisis and set point drop, sweating
5. Recuperation
First stage: Set point rising

- Because the body temperature is now below the set point, the subjective feeling is cold. Skin cold. Symptoms resemble hypothermia.
- Normal range actual body temperature, rising
- Feeling of cold, aversion to cold and wind.
- Shivering raises the metabolism and generates heat.
- Paleness. Closing of the pores to prevent sweating and heat loss.
Therapeutics

- Complete rest.
- Immediate fast.
- Long warm to hot shower or bath.
- Rest in bed with covers.
- Hydrate. Hot drinks and teas.
- Stimulating (hot) diaphoretics.
- Capsicum 500 mg Cinnamon. 5-10g Fresh Ginger 3-10g. Osha 3-10g Garlic, onion, scallions 3-10g.
Thomson’s Composition Powder

Core formula

• Myrica Bayberry 8 parts
• Zingiber Ginger 8 parts
• Populus Poplar bark 8 parts
• Capsicum Cayenne 1 part
• Eugenia Cloves 1 part

• With or Abies, Quercus instead of Populus in some published versions.
Fasting and Ghrelin

- Secreted by the gut wall of the stomach, small intestine, and large intestine when empty
- Has systemic anti-inflammatory effects
- May act as selective Cox-2 inhibitor
- Has febrifuge effects
- Promotes autophagy in the system and locally in the gut
- One basis for traditional aphorisms to fast during fever, and for traditions or herbal emesis and catharsis in febrile illness.
Second Stage: Peak fever

- Normally 102-104. “A good working fever.”
- Optimizes antibody production.
- The skin hot and dry.
- Patient may not feel hot.
- Pulse fast.
- Patient is drowsy.
- Muscles ache due to elevated cytokines. Tissue of long muscles is broken down to make amino acids available for immune component manufacture and tissue repair.
- Gut motility decreases and the natural appetite disappears.
- Blood concentrations of iron and zinc are reduced (denying food to pathogens).
Therapeutics

- Rest, well ventilated room, but no draft. Continue fast until fever falls below 99 degrees.
- Emphasize physical and mental comfort of patient.
- Avoid sour flavors and astringents.
- Melissa water.
- Tepid or cool water and drinks.
- Cooling and relaxant diaphoretics
  - *Mentha; Mentha/Achillea*
  - Eupatorium, Sambucus, Verbena.
- Sedative relaxants; Scullcap, Pedicularis.
Third stage: Intermittent fluctuations

- Diurnal fluctuations 6AM to 6PM.
- Diurnal fluctuations with cytokine waves.
- Day to day fluctuations over time with cytokine storms.
- Alternating cycles of fever, sweating, and chills.
- May develop food cravings, often for harmful foods.
Therapeutics

- Continue strategies already in place.
- Use moderate diaphoretics in formulas with mixed stimulant and relaxant effects.
- Keep patient warm when chilled.
- Intermittent short hot showers followed by warm blankets.
- Do not get out of bed too soon.
- See historical formulas with mixed herbal actions in following section.
Caution on diaphoretics

- Overdose, prolonged use, or inappropriate use may deplete the vitality and promote dehydration.
- Caution in depleted or already dehydrated patients.
- Avoid driving excessive perspiration.
- The purpose is to encourage *ventilation* not perspiration.
- “Only until normal moisture of the skin is attained”
  - William Cook - Physiomedicalist
- “Intake of these herbs should be discontinued immediately when the desire therapeutic results are attained”
  - Chen and Chen. Classical Chinese.
Avoid herbal antipyretic strategy

- Bitter ‘heat-clearing’ herbs may reduce fever/heat.
- It is as much a therapeutic error to use these to reduce the heat of fever as it is with antipyretic drugs.
- Berberine containing herbs, while useful in general for “hot” and infectious conditions, are generally inappropriate during the febrile stage of a disease.
- “Not until the fever has passed” Homeopath and Eclectic Edwin Hale on Hydrastis.
Fourth stage: Crisis and fall

- The set point falls.
- Drop may be abrupt, gradual, or in stages
- Feelings of heat
- Sweating may “soak the sheets.”
Therapeutics

- “If it ain’t broke don’t fix it.”
- Rest
- Hydrate
- Avoid chill
- Do not get out of bed too soon
Fifth stage: Recuperation

- Weakness, weak pulse
- Fast thready pulse
- Light headedness, dizziness
- Thirst.
- Possible alternating feelings of hot and cold.
Therapeutics

- Wait for natural hunger to return.
- Rest. Do not go back to work too soon.
- Replenish omega-3 fatty acids.
- Althea water. *Althea* 3 with *Ulmus* 1 and *Glycyrrhiza* 1
- *Asparagus* (shatavari) and *Lycium* tea.
- Mild bitter tonics sparingly. *Populus* or *Salix*.
- This stage at least the length or double the length of the actual fever, possibly longer
Materia medica categories
Strong heating diaphoretics

- Capsicum
- Eugenia
- Cinnamomum (cassia)
- Zingiber (fresh)
- Asarum
- Zanthoxylum
Milder stimulating diaphoretics

- Ligusticum (osha)
- Achillea (as hot tea)
- Monarda
Mixed stimulating and relaxing

- Mentha arvensis
- Mentha piperita
- Mentha spicata
- Melissa
- Nepeta
Relaxant diaphoretics

- *Eupatorium*, warm tea
- *Sambucus*
- *Verbena spp.*
- *Asclepias tuberosa*
- *Lobelia*
- *Dioscorea villosa*
- *Corallorhiza spp.*
Classic formulas

Generally combine mild stimulation with relaxation or sedation
Classical combinations

- Many traditional formulas contain combinations of *Mentha*, *Achillea*, and *Sambucus*
- Two mixed diaphoretics and one relaxant
• *Mentha* and *Sambucus*
• mild stimulant, mild relaxant

Edward Shook - Physiomedicalist
• *Mentha* and *Achillea*

• Mild mixed stimulant/relexant

  **Herbert Nowell – Physiomedicalist and Naturopath**
• *Eupatorium* 1

• *Asclepias* 2

• *Scutellaria* 1

  pure relaxant plus a sedative

• To the above, 1 part *Capsicum* if chills are predominant stimulant

R Swinburne Clymer - Physiomedicalist
- *Zingiber* and *Nepeta*
- Stimulant with modification for children

**Priest and Priest - Physiomedicalist**
• Thymus, Nepeta, Eupatorium
• stimulant, mixed, neutral

Tommie Bass - Appalachian
• **Zingiber and Lobelia**

• Stimulant and relaxant

**Wm Cook - Physiomedicalist**
Some individual herbs

Select those herbs which increase patient comfort and also enhance immunity and or mildly reduce inflammation, something which antipyretic drugs can never achieve.
General considerations

- Administer diaphoretics as hot teas.
- If using the tincture, deliver in hot water.
- Many diaphoretics have a hot/cold polarity – diaphoretic when given hot in mild concentration, but alterative/diuretic when given cold in strong concentration.
- Many warming diaphoretics are also emmenagogue.
- Many warming diaphoretics are also carminative and benefit the digestion.
Eupatorium perfoliatum

- The most famous and extensively used diaphoretic/febrifuge in North American history.
- Learned from Native Americans by European Colonists
- Became the panacea herbs for febrile illness in the colonies and through the mid-19th century.
- Used for malaria, yellow fever, influenza, and garden-variety fevers. Improved survival in influenza epidemics.
- Uses imply that it enhances immunity and reduces cytokine storm.
- Consider the tea may be much more effective than tincture. (See research on polysaccharides).
- Potentially emetic.
- Very bitter flavor, combines well with zingiber for flavor and effect.
**Sambucus species**

- Berries or flowers used. Traditional indications are equivalent.
- Recent research shows that a syrup shortens the duration and severity of the fever of influenza. For most patients, the fever is gone by the end of the second day.
- May have direct activity against influenza virus (speculative).
- Traditional indication indicate that it enhances antiviral defenses in the body.
Achillea

- Diaphoretic in hot delivery media
- More tonic, astringent, and diuretic in cold media.
- Aromatic bitter, warming through effects of essential oils, cooling through bitter principles
- Combines well with Mentha to enhance diaphoresis.
Mentha species

- *Mentha arvensis* (corn mint, poleo mint), most stimulating, contains the most menthol.
- *Mentha piperita*, intermediate stimulation, mid range menthol
- *Mentha spicata*, least stimulation, lowest menthol
Asclepias tuberosa

- “pure relaxant”
- Relaxes pores, allows you to “sweat for free”
- Affects mucous, serous, and synovial membranes, cooling inflammation, and facilitating normal secretions.
- Combines well with a little Zingiber
Lobelia inflata

- A non-toxic plant. See series of articles at http://medherb.com
- A powerful relaxant to both smooth and skeletal muscle
- A relaxant diaphoretic
- A strong relaxant expectorant
- Relaxes the cough reflex
- Emetic and/or cathartic in higher doses.
- Combines well with a small amount of Capsicum or a somewhat larger amount of Zingiber.
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