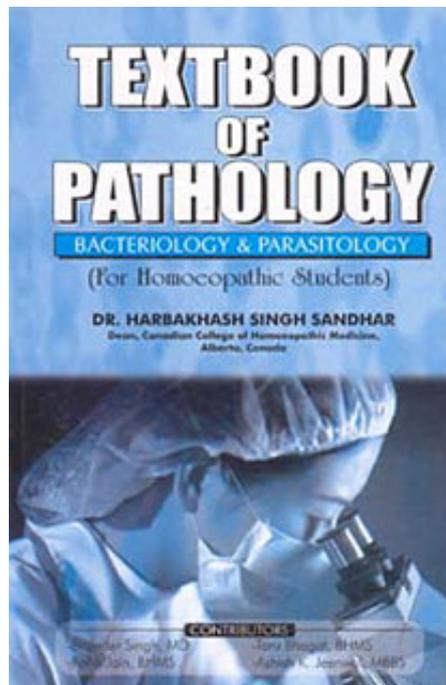


Harbakhsh Singh Sandhar Textbook of Pathology

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FEVER

DEFINITION

Fever is a condition of elevated body temperature above the normal range. It is also called Pyrexia. Fever is often accompanied with acceleration of pulse, increased tissue destruction, chills, aches, restlessness, and other symptoms.

Temperature of the body is taken by a clinical thermometer. Temperature is taken from axilla, when it is not possible to take the temperature from mouth; but the temperature taken from axilla may not be very correct. It is usually one degree less than the mouth temperature. Rectal temperature is the correct temperature of the body. It may be one degree higher than oral in certain conditions, such as in cholera.

Normal Temperature

The human body temperature in health is 98.4 °F or 37 °C. Range is 36-37.5 °C.

Maximum Temperature

It is the highest temperature of a person during a day or 24 hours.

Subnormal Temperature

It is below 98 °C.

Apyrexia

It is the condition in which the temperature is normal or below normal.

FACTORS MAINTAINING BODY TEMPERATURE

The average body temperature is 98.4 °F. or 37 °C with a diurnal variation of about one degree. The body temperature is highest in the late afternoon and lowest after midnight.

Body temperature depends on the following factors :

1. Increased heat production due to various causes, e.g. injury, toxins, excessive break down of protein substances in the body, poisons, etc.
2. Increased loss of heat due to perspiration and rapid breathing.
3. Heat regulating mechanism in the brain. It is disturbed in injuries to head, cerebral haemorrhage, heat stroke resulting in hyperpyrexia.

HYPOTHALAMUS is the organ involved in the regulation of the temperature in the body. It has sensory receptors from which it gathers information regarding body temperature, outside temperature etc. A set point temperature is there in the hypothalamus which is regulated from time to time. Body controls temperature via various mechanism like:

- Sweating
 - Shivering
 - Cutaneous vasoconstriction
 - Increased respiration etc.
4. Retention of excessive amount of heat in the body, e.g., heat stroke, malaria.

Chill usually follows fever, in about an hour. Chills are commonly found in malaria, influenza, kala azar, UTI, septicemia, filariasis, pneumonia, pyogenic bacteria and vaccines causing fever. When the chill is strong it may produce rigors and shivering. During chill skin becomes cold due to constriction of peripheral blood vessels. Chills are followed by heat and sweating and the fever comes down to normal.

CHANGES IN THE BODY DURING FEVER

Basal metabolism of the body is increased during fever. Increased breakdown of protein occurs as a result of increased metabolism which produces heat. The carbohydrate and fat metabolism is also disturbed leading to increased production of acids and increase in heat. Urine is diminished in production and becomes dark coloured. Changes occur in the blood cells depending upon the toxins and bacteria. The heat and chill regulating centres in the brain are stimulated leading to sweating and dissipation of heat of the body.

Continued fever results in weakness, emaciation due to destruction of proteins and stores of glycogen and fats of the body is depleted. There is fluid and electrolyte imbalance, weight loss, circulatory overload, arrhythmias etc. occurring.

Causation of Fever

1. Specific Causes

- (a) **Virus infections** — Chicken Pox, Measles, Influenza, Dengue, etc.
- (b) **Rickettsial infections** — Typhus, Trench Fever, Rocky Mountain Fever, Japanese River Fever, Q Fever, etc.
- (c) **Bacterial infections** — Staphylococci, Streptococci, Typhoid, Pneumonia, Dysentery, Scarlet, Plague, Anthrax, Malta Fever, Rheumatic Fever, T.B., Syphilis, Gonorrhoea.
- (d) **Protozoal infections** — Amoebic Dysentery, Malaria, Black Water Fever, Kala-Azar.
- (e) **Helminthiasis** — Filarial Fever, Schistosomiasis.

2. Poisons and Drugs

- (a) Snake, Scorpion, Bees, Food Poisoning.
- (b) Sera and Vaccines, etc.
- (c) Quinine, Arsenic, Belladonna, etc.

3. Injuries— Shocks, Burns, Heat, Cold, Fatigue, Haemorrhages, etc.

4. Endocrinic and Metabolic Diseases — Diabetes, Gout, Addison's disease, Thyrotoxicosis, etc.

5. Allergic Diseases — Catarrhal Fevers (Hay Fever), Menstrual Fever. Urticarial Fever, G.I. Allergy, etc.

6. Malignant Diseases — Cancer, Acute Lymphoblastic Leukaemia, Hodgkin's Disease, etc.

7. P.U.O. (Pyrexia of Unknown Origin)

8. Vascular — Myocardial Infarction, Pulmonary Embolism.

9. Hematological — Hemolytic disorders.

CLINICAL STAGES OF FEVER

Generally there are three clinical stages of fever:

- (i) Onset
- (ii) Festigium, and
- (iii) Defervescence

(i) Onset stage

This is the first stage when the fever is established. During this stage, the patient feels sometimes cold, chilliness, headache, malaise and pain all over the body. Sometimes these symptoms may be present even before the onset without the rise of temperature but during the onset the fever may rise suddenly or gradually.

(ii) Festigium stage

In this stage, the temperature of the body reaches its highest level and the patient feels extraordinarily hot and uncomfortable. In this stage, there may be thirst, restlessness, dryness and constipation. The urine is dark-coloured and may be scanty. During this stage, the eruptions generally come out.

(iii) Defervescence stage

During this stage, the temperature comes down to normal either by crisis (suddenly) or by lysis (slowly). In crisis, the temperature comes down to normal within 12 hours, as it occurs in the case of lobar-pneumonia. In the case of lysis the temperature gradually comes down in several days to normal and remains normal afterwards. Lysis occurs in typhoid fever, scarlet fever, and influenza.

TYPES OF FEVER

Fever may be the following varieties:

(i) Remittent fever

In this type of fever, if the temperature fluctuates not more than 1 °C during the 24 hours, it is called continued fever and fever never comes down to the normal level; but if the fever fluctuates more than 1 °C every day within 24 hours, it is called remittent fever.

The remittent fever is seen in Typhoid, T.B., Kala-azar and Septiceamia. Continuous fever is seen in Pneumonia, UTI, Typhus etc.

(ii) Intermittent fever

In this type of fever, the temperature comes down to normal or below normal daily or within 24 hours. The fever may last for a varying period. This type of fever is seen in case of malarial fever.

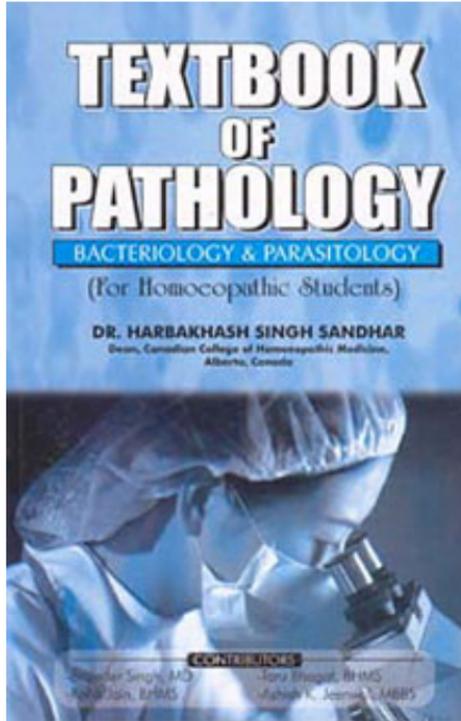
(iii) Recurrent fever

When the fever subsides and comes again, it is called recurrent fever. This type of fever may be seen in relapsing fever, undulant fever, malarial fever and tubercular fever. In case of relapsing fever, the fever is marked by alternating periods of pyrexia and apyrexia (no fever), each lasting from 5 to 7 days. This kind of fever is found in rat-bite fever.

(iv) Undulant fever

This is an intermittent type of fever and persists for about a month followed by an interval of 'no' fever and again followed by intermittent fever for about a month or so. The fever is called undulant because it has repeated waves like temperature lasting for a period of 6-9 months. This type of fever is found in Malta fever and is due to drinking goat's milk which contains *brucella melitensis*.

These are the main types of fever but there may be mixed type of fever. For example, in T.B., the temperature may be sometimes remittent and at other times intermittent or irregular. In malarial fever, the characteristic features are chill, heat, sweating followed by apyrexia. In exanthemata, the eruptions come out on different days; for example, chicken pox first day, scarlet fever second day, measles fourth day and typhoid fever about 7th to 10th day.



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