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1. Learning Outcomes

After studying this module, you shall be able to know about-

- Starvation
- Clinical features of acute and chronic starvation
- Autopsy findings and internal examination in case of starvation
- Medico-legal issues related to starvation

2. Starvation

“Where is there beauty, when you see deprivation and starvation” – Rosalind Russell

According to WHO, hunger is the single gravest threat to the world's public health. The United Nations Food and Agricultural Organisation estimates that about 805 million people of the 7.3 billion people in the world are suffering from some form of undernourishment. Starvation and neglect, though closely associated terms, are not one and the same.

- **Starvation** is due to complete or partial deprivation of regular and constant supply of food required maintaining human life. The effects of starvation are denoted by the term **inanition** which refers to the exhausted state due to prolonged undernutrition caused by lack of assimilation of food by the tissues.
- Malnutrition is a state that results from taking inadequate food (in sufficient quantity and quality) for some period.
- Cachexia means severe inanition.
- Emaciation means loss of body weight, whereas, **neglect** implies an act of omission, lack of care or attention, failure/forgetfulness to do something. The usual victims are either very old or very young, their dependence on others for care making them the vulnerable group.

For the very same reason, many countries have legislation designed to protect children against child abuse. In Britain, the Children Act places a responsibility upon parents, guardians or the community to care for children, while Sections 317 and 318 of Indian penal code, addresses ‘abandoning of infants’ and ‘concealment of birth’, respectively as a measure to curb the menace of neglect of unwanted infants.

Starvation was previously differentiated in the Nazi concentration camps into two main types; -'dry' type, in which there was emaciation, but only leg oedema, with a body weight up to half the normal -'wet' type described by marked oedema of face, trunk and limbs, with ascites and pleural effusions. Nutritional Marasmus and Kwashiorkor are two extreme forms of malnutrition.

- **Marasmus:** The subject is emaciated and body weight is less than 60% of the expected weight for age. The skin appears dry and inelastic. Hairs are hypopigmented. Abdomen is distended due to wasting and hypotonia of abdominal muscles.
- **Kwashiorkor:** It is characterized by growth retardation, psychomotor changes, and edema of dependent parts. The edema starts initially at lower extremities and later involves upper limbs and face. The face is puffy and appears moon-shaped.

Starvation may be classified as acute or chronic starvation.

1. **Acute starvation occurs** when food and water are suddenly and completely withheld as in wilful withholding of food and also wilful refusal to take food.
2. **Chronic starvation** occurs when there is gradual deficiency of food over a time, as in famines.

The obvious and outstanding appearance is of **emaciation** which is caused by an inadequate intake of food. A minimum of about 1900 calories is needed to maintain body weight in active adults. There is danger to life when more than 40 per cent of the original body weight has been lost, though the speed of loss is relevant. Total lack of food will obviously kill faster than a severe reduction which is in about 50-60 days as long as adequate water is available, but this depends on weather and temperature as well as fitness of the individual. Lack of water will kill in about 10 days - or less in higher ambient temperatures. The causes of starvation may be famine, fasting, malnutrition, overpopulation, poverty, war, anorexia nervosa, bulimia nervosa, depression, coma, gastrointestinal diseases.

Malnutrition results from partial deprivation of food over a period of time which may lead to deficiency of proteins, carbohydrates, vitamins, minerals in the body and where body weight gradually decreases due to loss of carbohydrates, fats and proteins further resulting in muscle wasting and emaciation.

Superimposed infections or malnutrition syndromes would eventually result in death.

‘**Marasmus**’ is usually confined to the description of infants whereas **cachexia** refers to acute loss of body weight. The so called 'Hippocratic facies' is not confined to the emaciation of neglect, as cachexia from any cause - such as an obstructive carcinoma of the oesophagus - can give rise to the same appearance.

Wasting and marasmus may occur from metabolic disorders, and diagnosis may require detailed biochemical studies which an autopsy alone may fail to reveal.

The cause of starvation may be difficult to ascertain, yet the question of neglect on the part of parents or guardians may crop up.

3. Autopsy Findings

Photographs and radiographic examination should be taken in all major views to exclude the possibility of child abuse.

Crown-heel, crown-rump, head diameter, foot length and exact weight must be recorded. The body usually appears greatly emaciated.

Reduced pressure of cerebrospinal fluid (CSF) may present as depressed fontanelles. Hair may be dry, lustreless, brittle, or depigmented.

With the help of a flexible tape, diameter of the limbs at recognised landmarks should be measured.

The skin is pale, dry, coarse, semi-translucent, shrivelled, fissured, wrinkled and, when pinched between the fingers, remains ridged because of loss of subcutaneous fat and fluid, while the skin of the face is stretched tightly across the cheek bones, the cheeks and the eyes are deeply sunken, the latter being due to the loss of orbital fat and an element of dehydration. Pigmentation, either diffuse or of a punctate nature, may be present. Dehydration is a common occurrence.

Skin infection due to lack of hygiene and pressure sores may occur on buttocks, heels and spinal region, elbows, knees, shoulders or occiput. In infants, urine dermatitis and lack of any skin care after defecation worsens these.

The limbs are almost skeleton like, with loss of fat and atrophy of muscles, abdomen is of 'scaphoid shape', with prominent ribs and concavities in the intercostal spaces, and sunken supraclavicular fossae. In children rickets and dental defects are seen while in adults, osteomalacia and stress fractures are noted. In chronic starvation, features of oedema and ascites may be evident due to hypoproteinaemia.

Consequent features of nutritional deficiency, such as intercurrent infections, avitaminoses, skin disorders and nutritional oedema may be observed. Superadded infections, dehydration, hypothermia are the most severe manifestations that contribute to death

Internal examination:

Heart is small from brown atrophy, the lungs pale, collapsed and exude very less blood on cut section, all other organs are small and contracted (except the brain).

The Stomach which is small, contracted and empty with bile stained mucosa.

There is loss of adipose tissue in the internal fat depots like omentum, mesentery and perirenal fat.

Intestines show atrophy of all the coats showing extensive thinning out like a tissue paper and translucency of the walls. The lower portion of the large intestines may sometimes contain hard, scybalous faecal matter. There may be ulceration of bowel. The kidneys show atrophy of nephron.

The gall bladder is usually distended and contains dark inspissated bile. The urinary bladder is empty. Samples for sodium, potassium, chloride, and urea nitrogen determination should be collected along with frozen sections for Sudan stain and samples for histologic study.

Fatal period

- Total withholding of food and water: 14-21 days.
- With total deprivation of food only: 3-6 weeks (8-12 weeks in some cases).

Factors influencing the fatality:

- i. **Age:** Children and infants are most vulnerable. Old person stands starvation better.
- ii. **Sex:** Women stand starvation better than men due to their body fat.
- iii. **Body condition:** Fatty and healthy individual stands starvation better.
- iv. **Environmental factors:** Exposure to cold and extreme heat shortens life.
- v. **Intercurrent infection:** It may cause early death.
- vi. **Physical exertion:** It will enhance the effects of starvation.

Cause of Death

Death occurs from exhaustion, circulatory failure due to brown atrophy of the heart or intercurrent infection.

4. Medico-legal Aspect

- 1) Starvation may be the manifestation of self-neglect or may be a criminal act.
- 2) The infant, children and older people are the unfortunate victims of intentional starvation.
- 3) Starvation may be homicidal. During Second World War many people (helpless Jews) suffered deliberate starvation in Nazi concentration camps in Belsen and other places in Germany.
- 4) Starvation may be accidental if person is caught/entombment in mines, earthquakes or landslides. Accidental starvation may be seen in famine and flood.
- 5) Suicidal starvation occurs when someone deliberately withhold food as seen among prisoner who go on hunger strike as a form of protest. Mahatma Gandhi was also known to have done hunger strike as a part of nonviolence movement against British rule. Many political leaders do the hunger strike for the demands or in protest of injustice. Voluntary starvation is also practiced by some people as a part of religious ceremony or for purpose of achieving salvation.
- 6) Article 21 of Indian Constitution guarantees the citizen of India for “Right to life and liberty” and food is basic human need to live life. Thus in broader sense, it is responsibility of State to provide food for the inhabitants.

- 7) Hunger striker is a mentally competent person, who has indicated that he has decided to embark on a hunger strike and has refused to take food and/or fluids for a significant interval.
- 8) Forcible feeding of person on hunger strike – in India, if the hunger strike causes the imminent danger to life as a result of deliberate starvation, such person can be taken into custody by State for forced-feeding and to save the life. *Provision of Sec 309 of IPC – attempt to commit suicide may be applied in such cases.*
- 9) Medical profession and hunger strikers – the doctor treating the hunger striker is faced with dual facts. On one hand, it is his moral duty to exercise his skills to save the life and act in the best interest of the patient. On the other hand, it is his duty to respect the patient's Autonomy. The problem arises when a hunger striker has issued a clear instruction not to treat him against his wishes. Under such circumstances, the moral obligation urges doctor to save the life but the duty urges to respect the patient's autonomy. *The World Medical Association (WMA) declaration on hunger strikers (1991) states that the ultimate decision on intervention or non-intervention should be left with the individual doctor.*
- 10) In view of law, forcible feeding of prisoner, against their wishes, is not an assault but quite lawful because the prisoners are under the care of State and State must take adequate measures to prevent the prisoner from injuring himself or taking his own life.
- 11) Homicidal starvation may occur in illegitimate children as a part of neglect. The Bombay Children Act 1948 provides special provision to discourage the neglect of children. It states that whoever having the actual charge of, or control over, a child wilfully assaults, ill-treats, neglects, abandons or exposes him or causes or procures him to be assaulted, ill-treated, neglected, abandoned or exposed or negligently fails to provide adequate food, clothes or medical aid or lodging for a child in a manner likely to cause such child unnecessary mental and physical suffering shall, on conviction, be punished with imprisonment of either description for a term not exceeding two years or with fine or both. For the purpose of this Act, a child means a boy or girl who has not attained the age of 16 years.

- 12) Section 317 of IPC deals with exposure and abandonment of child under 12 years by parent or person having care of it.
- 13) Practice of Santhara (also known as **Sallekhana**, **Samadhi-marana**, **Samnyasa-marana**) is prevalent in Jainism who perform voluntary and systematic fasting to **death**. i.e. suicidal starvation.

5. Summary

- **Starvation** is due to complete or partial deprivation of regular and constant supply of food required to maintain human life
- Emaciation means loss of body weight, whereas, **neglect** implies an act of omission, lack of care or attention, failure/forgetfulness to do something.
- The obvious and outstanding appearance is of **emaciation** which is caused by an inadequate intake of food. A minimum of about 1900 calories is needed to maintain body weight in active adults.
- Photographs and radiographic examination should be taken in all major views to exclude the possibility of child abuse.
- Consequent features of nutritional deficiency, such as intercurrent infections, avitaminoses, skin disorders and nutritional oedema may be observed.
- Intestines show atrophy of all the coats showing extensive thinning out like a tissue paper and translucency of the walls.
- Article 21 of Indian Constitution guarantees the citizen of India for “Right to life and liberty” and food is basic human need to live life.
- Homicidal starvation may occur in illegitimate children as a part of neglect. The Bombay Children Act 1948 provides special provision to discourage the neglect of children.
- Section 317 of IPC deals with exposure and abandonment of child under 12 years by parent or person having care of it.