WHO-Facts Sheet

1. BOTULISM
2. NUTRITION

Compiled and edited by
Babichan K Chandy

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1. BOTULISM

Overview:

Botulism is a disease caused by extremely potent toxins produced by the bacterium Clostridium botulinum. Person to person transmission of botulism does not occur. The sporulated form of the bacterium is commonly found in soils, sediments and marine waters. There are seven recognized types of botulism. Four of these (types A, B, E and rarely F) cause human botulism. Types C, D and E cause illness in mammals, birds and fish. Healthy adults can consume spores in small amounts with no ill effects. The spores are heat-resistant. Under anaerobic conditions, botulinum spores can germinate, and the bacterium can reproduce and produce toxin. Ingestion of the toxin formed during the growth of the bacteria that can be present in improperly prepared food is dangerous.

Symptoms:

The symptoms are not caused by the organism itself, but by the toxin that the bacterium releases. The toxin ingested by individuals produces the symptoms of disease, usually within 12 to 36 hours (within a range of four hours to eight days) after exposure. Incidence of botulism is low, but the mortality rate is high if treatment is not immediate and proper.

The characteristic early symptoms and signs are marked fatigue, weakness, and vertigo, usually followed by blurred vision, dry mouth, and difficulty in swallowing and speaking. Vomiting, diarrhoea, constipation and abdominal swelling may occur. The disease can progress to weakness in the neck and arms, after which the respiratory muscles and muscles of the lower body are affected. The paralysis may make breathing difficult. There is no fever and no loss of consciousness. Similar symptoms usually appear in individuals who shared the same food. Most cases recover, but the recovery period can take weeks or even months. The disease can be fatal in 5-10% of cases.

Different types of intoxication from the botulinum toxin have been recognized:

Exposure to Pre-Formed Toxin

Foodborne botulism occurs when the spores of the organism Clostridium botulinum germinate inside foodstuff and produce the bacterium that generates the toxin. Clostridium botulinum is an "anaerobic bacterium", which means it can only grow in the absence of oxygen. Therefore, botulism tends to occur when the spores are in an airtight environment (tins or jars), particularly in inadequately processed home-preserved foods, including those which have been preserved in oil. Occasionally, commercially-prepared foods are involved.

The Botulinum toxin has been found in a variety of foods, including low-acid vegetables, such as green beans, spinach, mushrooms, and beets; fish, including tuna, smoked and salted fish; and meat products, such as ham, chicken, sausage, and luncheon. The toxin is destroyed by normal cooking processes (heating at 80°C for ten minutes or boiling for a few minutes), and is not formed in acidic foods (pH less than 4.6).

Inhalation botulism following inhalation of the toxin (in an aerosol) has occurred in laboratory workers. In these cases, neurological symptoms may be the same as in foodborne botulism, but will develop faster.

Waterborne botulism can also result from the ingestion of the pre-formed toxin. Since water treatment processes inactivate the toxin, normally only contamination post-treatment will pose a risk to humans.

In addition, adverse effects of the pure toxin have been reported as a result of its medical use in

Address correspondence to:
Office of the Spokesperson, WHO, Geneva. Telephone (+41 22) 791 2599; Fax (+41 22) 791 4858; Email: inf@who.int

patients being treated for specific muscular disorders and in cosmetic surgery.

Intestinal Colonisation:

Infant botulism is extremely rare. It occurs when infants ingest spores, which germinate to produce bacteria that reproduce in the gut and release the toxin. In most adults and children older than about six months, this would not happen because the natural defences that develop over time prevent the germination and growth of Clostridium botulinum. Clinical symptoms in infants include constipation, loss of appetite, weakness, an altered cry, and a striking loss of head control. Infant botulism has been associated with honey contaminated with botulism spores. Mothers are warned not to feed raw honey to their infants, as it can contain botulinum spores.

Botulism of undetermined origin usually involves adult cases where no food or wound source can be identified. It has been suggested that these cases are comparable to infant botulism and may occur when the normal gut flora have been altered as a result of surgical procedures or antibiotic therapy.

In vivo:

Wound botulism occurs when the spores get into an open wound and are able to reproduce in an anaerobic environment. The symptoms produced are similar to the foodborne form, but may take up to two weeks to appear.

Prevention:

Prevention of botulism is based on good food preparation (particularly preservation) practices and hygiene. If exposure to the toxin via an aerosol is suspected, in order to prevent additional exposure to the patient and health care providers, the clothing of the patient must be removed and stored in plastic bags until it can be washed with soap and water. The patient must shower thoroughly.

Food and water samples associated with suspect cases must be obtained immediately, stored in proper sealed, and sent to reference laboratories in order to prevent further cases.

Treatment:

Antitoxin administration is indicated as soon as possible after clinical diagnosis has been made. Health authorities usually control antitoxin supplies. Severe botulism cases require supportive treatment, especially mechanical ventilation, which may be required for weeks or months. Antibiotics are not required (except in the case of wound botulism). There is a vaccine against botulism, but it is used very rarely as its effectiveness is not fully evaluated and it has side effects.

Botox injections:

The bacterium Clostridium botulinum is the same bacteria that is used in Botox injections. However, what is used in Botox treatments is the purified and diluted A neurotoxin. The neurotoxin is commercially available for clinical and cosmetic use. Treatment is administered in the medical setting, tailored according to the needs of the patient and is usually well tolerated. Occasionally there may be some side effects.

2. NUTRITION

Micronutrient Deficiencies: Eliminating Iodine Deficiency Disorders - The challenge

Iodine Deficiency is the world's most prevalent - yet easily preventable - cause of brain damage. Today we are on the verge of eliminating it - an achievement that will be hailed as a major public health triumph, ranking together with smallpox and poliomyelitis.

Iodine deficiency disorders (IDD) jeopardize children's mental health - often their very lives. They start before birth. Serious iodine deficiency during pregnancy may result in stillbirths, abortions and congenital abnormalities such as cretinism, a grave, irreversible form of mental retardation that affects people living in iodine-deficient areas of Africa and Asia. However, of far greater global and economic significance is IDD's less visible, yet more pervasive, level of mental impairment that lowers intellectual prowess at home, at school and at work.

The response: iodized salt

IODIZED SALT - a spectacularly simple, universally effective, wildly attractive and incredibly cheap technical weapon to eliminate Iodine Deficiency Disorders (IDD).

Less than 20 years ago, few people realized the magnitude of the problem, let alone the solution. However, since the 1980s, WHO has been at the forefront of a worldwide public health drive to eliminate this under-publicized yet devastating deficiency. The Department of Nutrition for Health and Development (NHD) provides both technical tools - scientifically sound standards, guidelines and methodologies - and guidance to build up countries' national salt iodization programmes.

Partnerships have been crucial to turning the tide against IDD. Alliances with UNICEF, ICCIDD (International Council for Control of Iodine Deficiency Disorders), international and bilateral agencies and the salt industry have helped

countries to put permanent national salt iodization programmes firmly in place.

Progress has been dramatic since the primary intervention strategy for IDD control - Universal Salt Iodization (USI) - was adopted in 1993. Salt was chosen because it is widely available and consumed in regular amounts throughout the year, and because the costs of iodizing it are extremely low - only about US$ 0.05 per person per year.

Where salt iodization has been in place for over five years, improvement in iodine status has been overwhelming. Over the last decade, the number of countries with salt iodization programmes doubled, rising from 46 to 93. As a result, today:

- 68% of the 5 billion people living in countries with IDD have access to iodized salt;
- The global rates of goitre, mental retardation and cretinism are falling fast

A few salient facts

- IDD affects over 740 million people, 13% of the world's population; 30% of the remainder are at risk.
- IDD preys upon poor, pregnant women and preschool children, posing serious public health problems in 130 developing countries.
- Iodine-deficient people may forfeit 15 IQ points.
- Nearly 50 million people suffer from some degree of IDD-related brain damage.

Yet we have the means to prevent it - small quantities of iodine at low cost.

Nutrition In Transition: Globalization And Its Impact On Nutrition Patterns And Diet-Related Diseases

Rapid changes in diets and lifestyles resulting from industrialization, urbanization, economic development and market globalization are having a significant impact on the nutritional status of populations. The processes of modernization and economic transition have led to industrialization in many countries and the development of economies that are dependent on trade in the global market. While results include improved standards of living and greater access to services, there have also been significant negative consequences in terms of inappropriate dietary patterns and decreased physical activities, and a corresponding increase in nutritional and diet-related diseases.

Food and food products have become commodities produced and traded in a market that has expanded from an essentially local base to an increasingly global one. Changes in the world food economy have contributed to shifting dietary patterns, for example increased consumption of an energy-dense diet high in fat, particularly saturated fat, and low in carbohydrates. This combines with a decline in energy expenditure that is associated with a sedentary lifestyle, with motorized transport, and labour-saving devices at home and at work largely replacing physically demanding manual tasks, and leisure time often being dominated by physically undemanding pastimes.

Because of these changes in dietary and lifestyle patterns, diet-related diseases - including obesity, diabetes mellitus, cardiovascular disease, hypertension and stroke, and various forms of cancer - are increasingly significant causes of disability and premature death in both developing and newly developed countries. They are taking over from more traditional public health concerns like undernutrition and infectious disease, and placing additional burdens on already overtaxed national health budgets.

Adolescent Nutrition: A Neglected Dimension

The world's adolescent population - 1200 million persons 10-19 years of age, or about 19% of the total population - faces a series of serious nutritional challenges not only affecting their growth and development but also their livelihood as adults. Yet adolescents remain a largely neglected, difficult-to-measure, and hard-to-reach population, in which the needs of adolescent girls in particular are often ignored.

Adolescence is a particularly unique period in life because it is a time of intense physical, psychosocial, and cognitive development. Increased nutritional needs at this juncture relate to the fact that adolescents gain up to 50% of their adult weight, more than 20% of their adult height, and 50% of their adult skeletal mass during this period.

Caloric and protein requirements are maximal. Increased physical activity, combined with poor eating habits and other considerations, e.g. menstruation and pregnancy, contribute to accentuating the potential risk for adolescents of poor nutrition. In summary, the main nutrition problems affecting adolescent populations worldwide include:

- undernutrition in terms of stunting and thinness, catch-up growth, and intrauterine growth retardation in pregnant adolescent girls;
- iron deficiency and anaemia;
- iodine deficiency;
- vitamin A deficiency;
- calcium deficiency;
- other specific nutrient deficiencies, e.g. zinc, folate; and
- obesity.

The area of adolescent health is difficult to study. There are many unknown factors and consequences for all of these forms of malnutrition during adolescence, in terms of standards, measurement indicators and health consequences.

Activities: Malnutrition among adolescent girls in South-East Asia is an exceptionally large and complex problem. To review the situation thoroughly and formulate appropriate recommendations and guidelines for action by the Region's Member States, the Programme of Nutrition in WHO's South-East Asia Regional Office, in collaboration with the adolescent health and maternal and child health programmes, organized a regional consultation of experts in New Delhi (1997).

The consultation's recommendations for action, which are directly relevant to other regions, include:

- an international growth reference suitable for adolescent children should be developed;
- assessment, advocacy, prevention and control initiatives need to be specifically developed in most countries to reduce anaemia in adolescent girls;
- community-based approaches need to be developed for the sustained strengthening of household food security with emphasis on nutritional adequacy for adolescent girls;
- mass information and awareness programmes are needed to alert governments and communities to the importance of health and nutrition for adolescent girls;
- an urgent need to ensure a sustainable adequate intake of iodine by all adolescent girls and women of childbearing age prior to conception - in the long term through iodized salt and, if necessary, in the short term through distribution of iodized oil capsules; and
- an urgent need to ensure adequate folate intake by adolescent girls and women of childbearing age prior to conception, in populations where there is an increased risk of neural tube defects.

As a result of the recommendations from the above-mentioned consultation, the WHO Model List of Essential Drugs has now been modified, and the recommended folate supplement for use during pregnancy has increased from 250 μg to 400 μg per day.