Yaws

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Key facts

- Yaws is a neglected tropical disease that affects the skin, bone and cartilage.
- It is caused by a bacterium from the same group of organisms that cause venereal syphilis. However, the transmission of yaws is not sexually-related.
- Humans are the only reservoir of this bacterial infection. A recent discovery that a single-dose of azithromycin (given orally) can cure the disease has raised the prospects of eradicating yaws altogether.
- Yaws mainly affects children below 15 years of age and is endemic in at least 14 countries.
- India is the only country to completely interrupt transmission during the past 6 years.
- Mass treatment campaigns using injectable penicillin from 1952 to 1964 in 46 countries reduced the prevalence of yaws by 95% (from an estimated 50 million cases down to 2.5 million).

Yaws forms part of a group of chronic bacterial infections caused by treponemes which include endemic syphilis (bejel) and pinta and are commonly known as endemic treponematoses. Yaws is the most common of these infections.

It is also known as framboesia (German or Dutch) and pian (French) and affects the skin, bone and cartilage.

Yaws is caused by T. Pallidum subspecies pertenue. This organism belongs to the same group of bacteria that cause venereal syphilis. It is found primarily in poor communities in warm, humid and tropical forest areas of Africa, Asia, Latin America and the Pacific.

Yaws is transmitted through direct (person-to-person) non-sexual contact with the fluid from the lesion of an infected person. Most lesions occur on the limbs. The initial lesion of yaws is teemed with the bacteria. Contact with this fluid, especially among children who play together and sustain minor injuries, leads to transmission of infection. The incubation period is 9–90 days (average 21 days).
About 75% of people affected are children under 15 years old (peak incidence occurs in children aged 6–10 years). Males and females are equally affected.

Overcrowding and poor personal hygiene facilitate the spread of the yaws. Without treatment, infection can lead to chronic disfigurement and disability.

**Scope of the problem**

An accurate global prevalence of yaws today is unknown and it is unclear how many countries managed to completely interrupt transmission of the disease during mass treatment campaigns in the 1950s using injectable penicillin.

Since 1990, formal reporting of yaws to WHO stopped due to the discontinuation of yaws eradication programmes in many countries. Only a few countries kept yaws as part of their public health agenda.

The last estimate by WHO in 1995 recorded a global prevalence of 2.5 million cases of endemic treponematoses (mostly yaws), including 460 000 infectious cases.

Reporting of yaws is not mandatory so the available data, published in a recent edition of the Weekly Epidemiological Record are only indications of the global distribution of the disease.

Surveys are currently in progress to assess the full extent of the disease. The current status of yaws in countries of the six WHO Regions is as follows:

- **WHO South East Asia Region**: Indonesia and Timor Leste.
- **WHO Western Pacific Region**: Papua New Guinea, Solomon Islands and Vanuatu.
- **WHO Eastern Mediterranean Region**: No information available.
- **WHO American Region**: No information available.
- **WHO European Region**: No information available.

**Signs and symptoms**

There are two basic stages of yaws: early (infectious) and late (non-infectious).

- In early yaws, an initial papilloma (a circular, solid, swelling on the skin, with no visible fluid) develops at the site of entry of the causative organism. This papilloma is full of the organisms and may persist for 3-6 months followed by natural healing. Without treatment, this is followed by disseminated skin lesions over the body. Papules (solid elevation of skin with no visible fluid up to a centimetre large) and macules (a discoloured flat skin patch without any sensory loss, e.g freckles) also occur in early yaws. Thickening and darkening of palms of
the hand and soles of the feet characterize the early stage of yaws. Bone pain and bone lesions may also occur in the early stage.

- Late yaws appears after five years of the initial infection and is characterized by disfigurement of the nose and bones, and palmar/plantar hyperkeratosis (thickening of the palms of the hand and the soles of the feet). These complications on the soles of the feet make it difficult for patients to walk.

A person (75% are children below 15 years) who lives in an endemic area is assumed to have yaws if he/she presents with:

- painless ulcer with scab;
- papilloma (benign tumour on skin);
- papules and macules; and
- thickening and darkening of palms of the hand and soles of the feet.

In the field, diagnosis is primarily based on clinical and epidemiological findings. WHO has recently published a pictorial guide to help health and community health workers in the field recognize the disease.

**Complications**

Without treatment, about 10% of affected individuals develop disfiguring and disabling complications – deformities of the legs and nose - after five years. The disease and its complications cause school absenteeism and prevent adults from farming activities.

**Treatment**

Two antibiotics may be used to treat yaws.

1. A recent study\(^1\) published in the Lancet in 2012 has shown that a single oral dose of azithromycin is as effective as benzathine penicillin. The dose for the treatment of yaws is 30 mg/kg (maximum 2g). Because of the ease of using an oral medicine, non-health workers such as village health workers, volunteers and community drug distributors can be trained to administer the treatment during large-scale treatment programmes. Azithromycin is now the preferred first line treatment of yaws.

2. Benzathine penicillin had been the mainstay of yaws treatment until 2012 when a study showed that a single-dose oral azithromycin is also effective. The recommended dosage is 1.2 million units (adults) and 600 000 units (children). However, the fact that it is administered by injection, means that it requires adequately trained health staff and adherence to sterile protocols, making it not conducive for large-scale treatment. Benzathine penicillin is still used wherever azithromycin is unavailable or when the patient cannot be treated with azithromycin.

**Prevention**
There is no vaccine for yaws. Prevention is based on the interruption of transmission through early diagnosis and mass or targeted treatment of affected populations or communities. Health education and improvement in personal hygiene are essential components of prevention.

**Past eradication efforts**

In 1949, the second World Health Assembly passed resolution WHA2.36 recognizing the public health importance of endemic treponematoses (yaws and bejel).

Between 1952 and 1964, WHO and UNICEF led a worldwide campaign to control and eventually eradicate these diseases in 46 countries. Mass campaigns using mobile teams in 46 countries examined over 300 million people and treated 50 million. By 1964, the prevalence of these diseases had decreased by 95% (2.5 million). This achievement is considered to be one of the success stories in public health.

Premature integration of yaws and other endemic treponematoses activities into weak health systems and the dismantling of the vertical eradication programmes after 1964 led to the failure to finish with the remaining 5% of cases. By the late 1970s, the diseases had begun to creep back, resulting in a World Health Assembly Resolution WHA 31.58 in 1978.

**WHO’s response: new eradication push**

A growing interest in neglected tropical diseases (NTDs), the publication in January 2012 of the WHO roadmap, the absence of transmission of yaws in India for the past six years, and the discovery that a single-dose of oral azithromycin can completely cure yaws have raised the optimism that yaws can now be eradicated.

Experts developed an eradication strategy for yaws during a meeting convened by WHO in Morges, Switzerland in March 2012. The two, new recommended policies that were developed in the meeting are:

- Total Community Treatment (TCT) – treatment of an entire endemic community, irrespective of the number of active clinical cases.
- Total Targeted Treatment (TTT) – treatment of all active clinical cases and their contacts (household, school and playmates).

As a first step in implementing the new eradication strategy, WHO plans to initiate large-scale treatment campaigns in selected endemic districts of six countries (Cameroon, Ghana, Indonesia, Papua New Guinea, the Solomon Islands, and Vanuatu).