Syphilis is a bacterial infectious disease caused by Treponema pallidum. T. pallidum is a highly motile spirochete bacterium sized 0.1-0.2 μm in diameter and 6-20 μm in length. It can be observed microscopically by staining or by using dark field microscopy. The pathogenicity of T. pallidum has not been fully elucidated.

In Japan, notification of all detected syphilis cases began in 1948 under the Venereal Diseases Prevention Law. In April 1999, syphilis was classified as category V notifiable infectious disease under the Infectious Diseases Control Law. A physician who diagnoses a syphilis case must notify it to the nearby health center within 7 days (see http://www.niid.go.jp/niid/images/iasr/36/420/de4201.pdf for notification criteria).

Routes of infection and clinical manifestations: Generally, the infection is acquired through sexual contact with a person in the early stage of syphilis. Transmission occurs when T. pallidum present in lesion exudate penetrates the skin through mucous membrane or damaged skin. Placental infection of a fetus from the infected mother causes abortion, stillbirth or congenital syphilis. There is no evidence of transmission of syphilis through breast-feeding.

Three to six weeks after infection, an infected person usually develops initial sclerosis and hard chancres at the infected sites (primary symptomatic syphilis). During the latency period of a few weeks to months that follows, the bacteria spreads via blood circulation, and the infection becomes generalized giving rise to rashes appearing on the skin or on the mucous membrane (secondary symptomatic syphilis). Primary and secondary symptomatic syphilis are collectively called “early symptomatic syphilis”. A few years to some decades after infection, gummas, cardiovascular and/or neurological symptoms characteristic of “late symptomatic syphilis” appear. Infected persons are often asymptomatic during the period between the early and late symptomatic phases, which often results in delayed diagnosis and treatment.

Congenital syphilis consists of early and late congenital syphilis. Early congenital syphilis is characterized by development of skin lesions, hepatosplenomegaly and osteochondritis, shortly after birth. After a latent period without clinical manifestations, late congenital syphilis, characterized by development of Hutchinson’s triad, parenchymatous keratitis, inner ear deafness and Hutchinson teeth, appear during childhood.

Laboratory diagnosis and therapy: Laboratory diagnosis consists of direct identification of the causative agent, T. pallidum, under an optical microscope and/or detection of antibodies against Treponemal antigen or cardiolipin antigen (see p. 20 of this issue). PCR detection of the bacterial genome from skin lesions is used as a test to supplement the antibody tests when the patients have yet to seroconvert (see p. 21 of this issue). Penicillin is the first choice for therapy, and no penicillin-resistant strains have been yet reported.
National Epidemiological Surveillance of Infectious Diseases: The law governing surveillance of syphilis was switched from the Venereal Diseases Prevention Law to the Infectious Diseases Control Law in April 1999 (indicated by an asterisk in Fig. 1). Overall, the number of reported syphilis cases continuously decreased from 1948 until 2010, though with slight fluctuations (Fig. 1). Since 2010, however, notification has been on the rise (Fig. 1). The total number of reported syphilis cases in 2008-2014 was 6,745, which consisted of 5,262 males and 1,483 females (as of 15 January 2015). Among them, 3,740 were early symptomatic syphilis (1,290 primary and 2,450 secondary; average annual notification rate: 0.42 per 100,000 population), 399 late symptomatic syphilis, 2,567 asymptomatic syphilis, and 39 congenital syphilis (Table 1). The average annual notification rate of total syphilis cases in 2008-2014 was 0.75 per 100,000 population. Cases from Tokyo, Osaka, Aichi, Kanagawa and Fukuoka prefectures occupied 62% of cases (Table 2 in p.19).

Fig. 2 shows the age distribution of cases. The age distribution of early symptomatic syphilis showed a broad range from 20 years to 44 years. Among the early symptomatic syphilis cases, the number of male patients in their 20’s-40’s increased from 2012 to 2014, while the number of female patients, particularly in their 10’s-20’s, doubled from 2013 to 2014 (Fig. 3 left). The number of early symptomatic syphilis cases under the age of 18 years was 57 from 2008 to 2014 (14, 4, 5, 4, 6, 10, and 14 in respective years); among them 21 were males and 36 females. As for transmission routes, among males, there was a notable increase in cases associated with homosexual contact since 2008, though heterosexual contact have also been increasing; among females, the main transmission route was heterosexual contact (Fig. 3 right).

In 2014, the incidence of congenital syphilis (per 100,000 live births) was 1.0, which was the highest in the last 7 years (Table 1). From 2008 to 2013, the annual incidence was 0.8, 0.5, 0.1, 0.6, 0.4 and 0.4 per 100,000 live births, respectively (birth data derived from Vital Statics, the Ministry of Health, Labour, and Welfare’s demographic survey; 2014 data based on tentative estimate).

Reported number of asymptomatic syphilis increased, which was detected during such times as clinical consultations on ailments related to other sexually transmitted diseases, blood testing before blood donation, prenatal checkups, and laboratory tests before surgical operations (Table 1).

Prevention and control: Frequent sexual contact with casual partners, particularly without using condoms, is a high risk behavior. Genital ulcers caused by syphilis increase the risk of infection by other sexually transmitted diseases including HIV. The co-infection of HIV and syphilis enhances the progress of both infections (see p. 22 of this issue). Infection through blood transfusion, which was a serious problem in the past, has almost disappeared owing to the advancement of blood screening technology. Needle-stick injury- or laboratory-acquired infection risks persist, however.

The risk of congenital syphilis increases when a fetus is infected after the formation of placenta, i.e., the 16th week of gestation. It is therefore important to instruct expectant mothers to receive a syphilis test in the early stage of pregnancy, and receive appropriate therapy if she is found to be infected. It is also important that women take measures to prevent syphilis infection during pregnancy (IASR 34: 113-114, 2013).

In recent years, increase in asymptomatic and early symptomatic syphilis have been reported not only in Japan but also from abroad (see p. 24 of this issue). Providing young and sexually active people with appropriate information is a crucial public health measure. Such information should include: (i) transmissibility of syphilis...
through oral or anal sex (see p. 23 of this issue); (ii) absence of life-long immunity to syphilis; and (iii) progression of the disease when the infected are not treated during the asymptomatic phase between the early and late symptomatic phases. Physicians who have diagnosed syphilis should not only notify and treat the case but also educate and/or test his/her sexual partner(s). National guidance on the prevention of sexually transmitted infections emphasizes the importance of early detection and early treatment as effective measures for preventing infection and spread of sexually transmitted diseases.