

Acquired Syphilis in a Chinese Family among Three Generations

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To the Editor: Syphilis is primarily a sexually transmitted disease caused by *Treponema pallidum*, which can be present in various body fluids such as blood, saliva, sperm, cerebrospinal fluid, and also in active skin lesions.^[1] Acquired syphilis contracted by Children is highly attributed to sexual abuse; however, infection can also occur by nonsexual contact; for example, prechewing feeding, kissing, fondling, or by contaminated utensils, particularly when family members or caregivers have active syphilis.^[2,3]

We here describe four cases of Chinese patients from one family and specifically focus on how they got infected with acquired syphilis. Details of the cases are summarized in Supplementary Table 1. The first family member referred to our clinic was a boy, who experienced rashes around his anus [Figure 1a] and hair loss [Figure 1b] for 2 weeks. A surgical biopsy taken from his perianal lesions revealed pseudo-epitheliomatous hyperplasia with irregular elongation of rete ridges and an inflammatory infiltrate dominated by plasma cells in hematoxylin-eosin staining [Figure 1c and 1d]. Immunohistochemical analysis using a polyclonal antibody against *T. pallidum* demonstrated numerous spirochetes [Figure 1e]. The serological test results showed a positive rapid plasma reagin (RPR) with a 1:128 titer, positive *T. pallidum* particle assay (TPPA), and negative human immunodeficiency virus. According to the clinical features and positive blood test and biopsy results, the diagnosis of secondary syphilis was confirmed. Further evaluations including neurologic and psychiatric examination showed normal findings. The family members denied the possibility of sexual abuse to the boy. Both of the parents denied a history of syphilis. The mother's routine prenatal RPR and TPPA tests were negative, and the child was also normal at birth. The parents were given another serological test. The mother's results were negative, but the father's results showed positive TPPA with a 1:16 RPR titer. Physical examination found two scars on his jaw [Figure 1f] which had existed for 30 days. Subsequently, the father was diagnosed with syphilitic primary chancre by surgical biopsy and positive blood test. The father strongly denied extramarital sex and claimed that he had no sexual behavior at least for 6 months and he had a serology test for syphilis 3 months ago with normal results. The father said that he shared the grandfather's manual razor 2 months ago for 2 weeks and occasionally cut his jaw and then two ulcers appeared.

The grandmother said that she was the boy's primary caregiver and she had the habit of prechewing food before feeding the boy. She denied a history of syphilis and extramarital sex and the only sexual behavior was with her husband 2 months ago. She had oral patches [Figure 1g] and nonpruritic red spots on her body [Figure 1h] 3 weeks ago. Secondary syphilis was approved by positive TPPA and 1:64 RPR titer. The grandfather was interviewed and he admitted that he had purchased unprotected commercial sex several times. Physical examinations appeared normal, but syphilitic tests showed positive TPPA and 1:32 RPR titer. According to such features, he was diagnosed with latent syphilis. The infected family members were given 3 successive weekly doses of 50,000 U/kg intramuscular benzathine penicillin. All of the family members are still being followed up.

Syphilis has been highly epidemic in China for over 20 years. In 2015, a total number of 433,974 new cases of syphilis in China were reported.^[4] Sexual contact accounts for most of the cases; however, infection can also be caused by nonsexual contact with active lesions or by contaminated utensils, razors, or other articles for daily use, so syphilis can transmit among family members.^[1,3] Several years ago, we had reported three cases of Chinese preschoolchildren who contracted secondary syphilis from their caregivers by nonsexual close contact.^[5] Recently, it was reported that infants can contract syphilis by mouth-to-mouth transfer of prechewed food from actively infected relatives.^[2] In our cases, the grandfather initiated the disease and contagion swept through the family. At first, the grandfather got infected with syphilis by unprotected commercial sex and then transmitted it to his wife by sexual behavior. Meanwhile, the father became a victim by sharing the same manual razor. After being ruled out the possibility of sexual abuse, the 2-year-old innocent boy suffered syphilis mainly due to the grandmother's bad habit of prechewing feeding when she was in the active stage.

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Figure 1: The clinical and pathological photographs of patients with syphilis. (a) Several red and flat-topped, hypertrophic, moist, and superficial ulcerated verrucous plaques sized 1.0–1.5 cm in diameter around the anus of the boy. (b) Diffused moth-eaten alopecia on the boy's scalp. (c) A skin biopsy specimen from the boy's perianal lesions showed pseudo-epitheliomatous hyperplasia with irregular elongation of rete ridges (H and E, $\times 40$). (d) Interface infiltration with plasma cell predominance (H and E, $\times 400$). (e) Immunohistochemical analysis using polyclonal antibody against *Treponema pallidum* demonstrated numerous spirochetes ($\times 400$). (f) Two round well-demarcated slight red scars close to 0.5 and 1.0 cm in diameter, respectively, on the father's jaw. (g) Several irregular shaped grayish-white patches on the grandmother's palate and pharynx. (h) Many round or oval reddish macula on the grandmother's palms.

Currently, in China, most children are looked after by their grandparents who act as caregivers because their parents are busy with working. The aged individuals still have sexual desire, especially those men between 50 and 65 years old are most likely to purchase commercial sex. Correspondingly, the proportion of elderly people with syphilis in China increased markedly.^[4] Much concerns and interventions against syphilis of elderly people should be given.

Our cases support the hypothesis that intrafamily close contact could be a mode of syphilis transmission, which has not been fully recognized. However, when primary or secondary syphilis occurs in children, sexual abuse is the most common mode of transmission. In our cases, although we found no evidence of sexual abuse in the boy, we think it is essential that sufficient investigations into possible sexual abuse should be made.

Supplementary information is linked to the online version of the paper on the Chinese Medical Journal website.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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Supplementary Table 1: Details of the four patients with syphilis from one family								
Patients	Age of onset (years)	Physical examination findings	Serological tests			Diagnosis	Infection mode	Figure
			TPPA	RPR	HIV			
Boy	2	Several red and flat-topped, hypertrophic, moist, and superficial ulcerated verrucous plaques sized 1.0–1.5 cm in diameter in the perianal region, and a diffused moth-eaten alopecia appearance on the scalp	Positive	1:128	Negative	Secondary syphilis	Being prechewing feed and close contact with his grandmother	Figure 1a and 1b
Father	27	Two round well-demarcated slight red scars close to 0.5 cm and 1.0 cm in diameter, respectively, on the jaw accompanied with lymphonodi mandibularis enlargement	Positive	1:16	Negative	Syphilitic primary chancre	Sharing the grandfather's manual razor	Figure 1f
Grandmother	52	Diffused erythematous eruptions around the trunk and limbs, and some round or oval reddish macula on palms, and several irregular shaped grayish-white patches on the palate and pharynx	Positive	1:64	Negative	Secondary syphilis	Having sex with her husband	Figure 1g and 1h
Grandfather	55	Normal	Positive	1:32	Negative	Latent syphilis	Purchasing unprotected commercial sex	Nil

TPPA: *Treponema pallidum* particle assay; RPR: Rapid plasma reagin; HIV: Human immunodeficiency virus.