False-positive TPPA and TRUST syphilis test results in a patient with antiphospholipid syndrome and monoclonal immunoglobulinaemia

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A 56-year-old woman presented to our hospital service with headache and neck and shoulder pain. She was eventually diagnosed with antiphospholipid syndrome and monoclonal immunoglobulinaemia of unknown significance (MGUS). The *Treponema pallidum* (TP) particle agglutination assay (TPPA) and syphilis toluidine red unheated serum test (TRUST) were positive with TPPA 1:20 480 and TRUST 1:131 072. HIV and hepatitis tests were negative. Previous medical history included four miscarriages for unknown causes. No skin rash or other abnormalities suggestive of syphilis were observed. Her spouse was healthy and showed negative syphilis serology. There were no other partners. Based on a diagnosis of latent syphilis, she was given the recommended penicillin therapy. However, after three courses of treatment, the TRUST titre was 1:32 768, and the TPPA titre remained unchanged with 1:20 480. TP IgM was positive by immunoblotting, whereas ELISA IgG anti-TP assays (TP-ELISA) and the fluorescent treponemal antibody absorbed test (FTA-ABS) and blood TP-nested PCR were negative. Further investigations showed a normal cerebrospinal fluid (CSF) with negative TPPA and TRUST, and unremarkable brain MRI, abdominal ultrasound scan and Doppler echocardiography. Hence, we considered the possibility of false-positive syphilis TPPA and TRUST results associated with antiphospholipid syndrome and MGUS.

False-positive non-specific syphilis serology (TRUST/venereal disease research laboratory test) can be caused by various diseases, especially autoimmune diseases like antiphospholipid syndrome.[1] In addition, plasma cell diseases such as multiple myeloma and macroglobulinaemia can lead to false-positive tests, but titres are usually low, and TP/specific tests (TPPA/TP-ELISA/FTA-ABS) are negative.[2] Unusually in this case, both TPPA and TRUST titres were significantly higher than previously reported.

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Handling editor Anna Maria Geretti

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Contributors GL conducted the study and wrote all draft supported by XZ, RD, Y-KC, RAA and Y-YL. XZ and Y-KC completed some serological tests of syphilis. RD collected and sorted out the clinical data of the patient. All authors were involved in drafting and finalising the paper. All authors read and approved the final manuscript.

Funding This work was supported in part by the Project of AIDS Bureau of Yunnan Province, the "Ten-thousand Talents Programme" of Yunnan Province(YNWR-MY-2018–039), the Medical Leadership Foundation of Health and Family Planning Commission of Yunnan Province, China (L-201613), the Yunnan Province Clinical Research Center for Skin Immune Diseases (2019ZF012), and the Yunnan Province Clinical Centre for Skin Immune Diseases (ZX2019-03-02).

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; internally peer reviewed.

G-LL, X-YZ and R-JD contributed equally.

G-LL, X-YZ and R-JD are joint first authors.

To cite Liu G-L, Zhou X-Y, Dong R-J, *et al*. *Sex Transm Infect* 2022;**98**:313. Published Online First 17 March 2022

Sex Transm Infect 2022;**98**:313. doi:10.1136/sextrans-2021-055386

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