



Short Communication

Recall of symptoms and treatment of syphilis and yaws by healthy blood donors screening positive for syphilis in Kumasi, Ghana

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SUMMARY

Objective: To describe the recalled medical history, clinical manifestations, and treatment of yaws and syphilis by syphilis seroreactive blood donors in Kumasi, Ghana.**Methods:** Of the blood donors at Komfo Anokye Teaching Hospital, Kumasi, Ghana tested with the syphilis rapid diagnostic test (RDT) and later by rapid plasma reagin (RPR) test, 526 were seroreactive. Four hundred and seventy-one (89.5%) of these subjects were confirmed with the Ortho-Vitros Syphilis TP test as the gold standard and were interviewed to determine past or present clinical manifestations of yaws and syphilis.**Results:** Of the 471 respondent donors, 28 (5.9%) gave a history of skin lesions and sores; four (14.3%) of these subjects, who were all male and RPR-positive, recalled a diagnosis of syphilis. All four reported having had skin lesions/bumps with slow-healing sores, but only one of them had had these symptoms before the age of 15 years.**Conclusions:** A small proportion of confirmed seroreactive donors in this sample had any recall of symptoms or treatment for yaws or syphilis. These data suggest that clinical questioning adds little further information to the current screening algorithm. The relative contribution of yaws and syphilis to frequent positive tests in endemic areas remains speculative.© 2016 The Author(s). Published by Elsevier Ltd on behalf of International Society for Infectious Diseases. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Yaws is a neglected non-venereal endemic treponematoses caused by the bacterium *Treponema pallidum* subspecies *pertenue*.¹ It is spread by direct skin-to-skin contact and predominantly affects children less than 15 years of age living in poor socio-economic conditions in certain rural, wet, and tropical areas.² In Ghana, a total of 28 000 cases were reported in 2008 and 25 000 in 2010. In 2012, the World Health Organization (WHO) launched a new initiative to eradicate yaws globally by 2020 using the Morges strategy.³ The clinical manifestations of yaws include multiple papillomas, non-tender ulcers, sores, plantar hyperkeratosis, and

pigmentation of the palms and soles, followed by gummata in the last stage.¹

Syphilis is a sexually transmitted disease caused by *Treponema pallidum* subspecies *pallidum*. It can also be transmitted via blood transfusion, although the actual risk is low.⁴ Syphilis starts with a primary lesion (chancre – usually on the genitals), followed by a polymorphic rash and lymphadenopathy. This is followed by the occurrence of a generalized condition with parenchymal, systemic, and mucocutaneous manifestations.⁵ The end result may include dementia, gummata, blindness, paralysis, or death.

Usually yaws and syphilis can only be distinguished by epidemiological characteristics and clinical manifestations, as the commonly used antibody tests cannot discriminate one disease from the other.⁶

This paper reports on the recalled history of clinical manifestations of yaws and syphilis by syphilis seroreactive blood donors in Kumasi, Ghana.

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2. Methods

Of the total of 16 016 blood donors tested with a treponemal Fortress rapid test (Fortress Diagnostics Ltd, Antrim, UK) for *T. pallidum* in serum or plasma antibodies (IgG and IgM), 526 (3.3%) were seroreactive for syphilis. These subjects were further tested with the rapid plasma reagin test (RPR) (BD Macro-Vue Card test; BD, Franklin Lakes, New Jersey, USA) to detect potential active infections. Out of these, 478 cases were confirmed with the Ortho-Vitros Syphilis TP test as the gold standard. Four hundred and seventy-one of these confirmed syphilis seroreactive blood donors were interviewed to determine past or present clinical manifestations of yaws and syphilis (response rate of 98.5%) (Figure 1). Subjects were interviewed by a laboratory scientist using a semi-structured questionnaire in the local dialect for the presence or absence of current or previous sores or skin ulcers, and skin lesions/bumps on the face, hands, feet, or genitals. They were also asked about slow-healing sores and at what age they had experienced symptoms. Furthermore, they were asked about any treatment given at the time of these symptoms.

Data were recorded on an Excel spreadsheet and exported into Stata version 12.0 software (StataCorp, TX, USA) for analysis. Approval for this study was obtained from the ethics committees of Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana, and the Liverpool School of Tropical Medicine, Liverpool, UK.

3. Results

The age of confirmed syphilis seroreactive subjects ranged from 17 to 53 years (mean age 31 years, standard deviation 8.6 years).

There were fewer females (29/471; 6.2%) than males (442/471; 93.8%). Of the 471 respondents, 28 (5.9%) gave a history of skin lesions and sores (Figure 1). Four (14.3%) individuals out of the 28 donors with a history of skin lesions and sores – all male and RPR-positive – recalled a diagnosis of syphilis. These four donors had previously received penicillin treatment during their exposure to syphilis. Additionally, the four donors with a recall of syphilis diagnosis reported the appearance of lesions/bumps on the skin and slow-healing sores, but only one of them had had these symptoms before the age of 15 years. It could not be clarified whether this donor had had yaws or syphilis at this young age, although he had been treated.

4. Discussion

The data presented here suggest that a clinical history of yaws is not frequent among syphilis-positive blood donors. However, syphilis symptoms were also not reported frequently. Children aged below 15 years are the most vulnerable to yaws infection.⁷ Only a small proportion of confirmed seroreactive donors had any recall of symptoms or treatment of yaws or syphilis. Thus the relative contribution of yaws and syphilis to frequent positive tests in endemic areas remains speculative. The present authors have previously suggested combined specific and non-specific syphilis testing to identify potential infectious donors.⁸ The present data suggest that clinical questioning adds little further information to this screening algorithm. As a limitation, donors were interviewed after knowing that they had a positive test for syphilis. This represents a risk of recall bias, with reporting being influenced by the test results. There is furthermore a risk of misclassification bias, as many differential diagnoses exist for both syphilis and yaws.

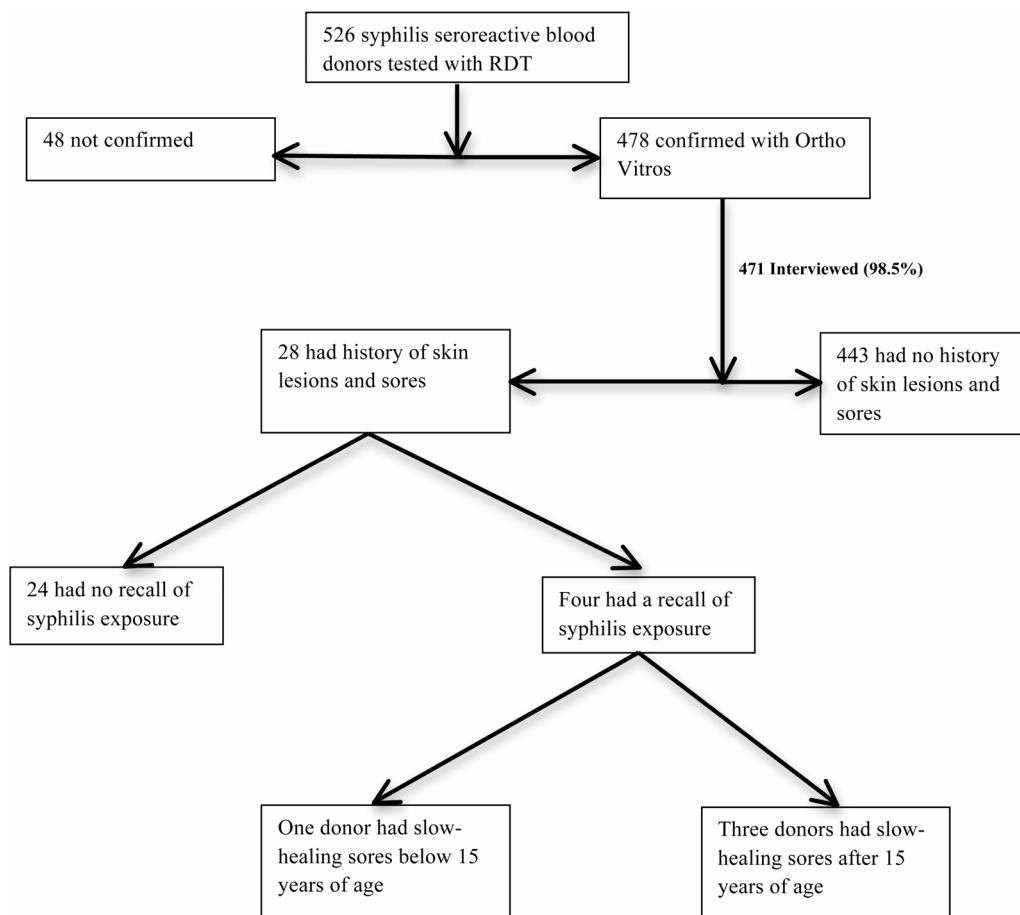


Figure 1. Flowchart of syphilis seroreactive blood donors interviewed for clinical manifestations of yaws.

However, despite these limitations, the conclusion that clinical questioning adds little further information when investigating syphilis seropositive blood donors in areas where both treponematoses exist seems solid.

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