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Congenital Syphilis: An Emerging, Preventable Public Health Crisis.
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Guest: Dr. Kayode Balogun is from the Montefiore Medical Center in New York City.

Bob Barrett: This is a podcast from *Clinical Chemistry*, a production of the Association for Diagnostics & Laboratory Medicine. I'm Bob Barrett. Congenital syphilis caused by transplacental infection or contact with paternal lesions during delivery can cause serious complications for the neonate. Anemia, jaundice, failure to thrive, neurologic disorder, and developmental delays are all possible consequences of untreated infection. Fortunately, maternal and neonatal syphilis are both treatable and early treatment prevents long-term complication. However, treatment cannot be initiated without first identifying the presence of syphilis infection.

For this reason, the CDC recommends syphilis screening during the first prenatal visit, but for many pregnant women, clinical laboratory testing and follow-up medical care is unavailable. Adding a sense of urgency to the problem, the rate of congenital syphilis in the United States has increased sharply since 2017. Why is this happening and what can clinical laboratorians do about it? A News & Views article appearing in the September 2024 issue of *Clinical Chemistry* highlights the increasing rate of congenital syphilis, summarizes causes, and proposes strategies to address this public health concern.

In this podcast, we are joined by the article's author. Dr. Kayode Balogun is a Co-Director of Clinical Chemistry and the Director of Endocrinology and Immunology Labs at the Montefiore Medical Center in New York City. His research interests center around infectious diseases in maternal and infant health as well as the associated biochemical changes resulting from infection and pharmacotherapy. So, first of all, let's get to the basics. What is congenital syphilis and why is this a significant public health issue?

Kayode Balogun: Thanks, Bob. Syphilis is a sexually transmitted infection caused by the bacterium *Treponema pallidum*, and it can lead to serious health issues, both immediately and in the long-term, whereas congenital syphilis, of course, when a pregnant person with untreated syphilis transmit infection to the baby. This can result in severe outcomes such as miscarriage, stillbirth, and premature and low birth weight babies.

One of the main concerns with congenital syphilis is that infants may not show obvious symptoms at birth. However, without prompt treatment these babies can face serious health issues including developmental delays, which may become apparent in the first few weeks of life or even years after birth. So, what makes congenital syphilis a public health issue is that despite advances in preventing and treating syphilis and a decline in the vertical transmission rates for other infections like HIV and hepatitis B, congenital syphilis remains a pressing global health issue.

According to the Centers for Disease Control and Prevention, the CDC, more than 3,700 babies were born with syphilis in 2022, which is over 10 times the number of cases reported in 2012. In the same length, the WHO, the World Health Organization, estimated that there were approximately 700,000 cases of congenital syphilis globally in 2022, leading to approximately 150,000 fetal deaths and stillbirths, 70,000 and thereabouts neonatal death, and 55,000 preterm or low birth weight births. So, Bob, this is really alarming, considering the wealth of knowledge we have amassed over the years in how to prevent and treat syphilis.

Bob Barrett: It really is something. What's going on? What are the factors contributing to the rise in these congenital syphilis cases?

Kayode Balogun: I believe the main issue driving the rise in congenital syphilis is insufficient prenatal testing and treatment. The increase in cases of congenital syphilis is linked to a rise in syphilis among women of childbearing age, coupled with social and economic barriers that hinder access to quality prenatal care. Additionally, there have been declines in prevention, resources, and infrastructure. In fact, around 90% of the congenital syphilis cases in 2022 could have been avoided with timely testing and treatment during pregnancy. Many individuals who tested positive for syphilis during pregnancy did not receive the necessary or timely treatment.

Furthermore, a major risk factor is where people live. That means in areas with limited prenatal screening, surveillance, and healthcare services, are most affected. Interestingly, even in several high-income countries with accessible antenatal screening programs and treatment, congenital syphilis rates are still rising.

So, this highlights the urgent need to address the underlying factors and strengthening policies, testing and guidelines, and risk mitigation strategies.

Bob Barrett: We've already touched on this a bit but I'd like you to go into a little more detail. What are the obstacles preventing timely syphilis testing and treatment during pregnancy?

Kayode Balogun: Great question. Missed chances to prevent congenital syphilis are a result from a combination of individual and systemic barriers to timely testing and treatment. At the individual level, barriers can include socioeconomic status, cultural beliefs, and fear of stigma of getting diagnosed and/or treated for syphilis. Somatic barriers on the other end involve issues are like discrimination, and more importantly, health disparities. Health disparities contribute to a varying syphilis rates across and within countries, with congenital syphilis disproportionately affecting marginalized groups.

In both high-income and low- and middle-income countries, stigma and discrimination hinder effective screening and prenatal care. In the context of syphilis, as with other sexually transmitted infections, stigma is perpetuated by three main factors: One, institutional barriers, such as criminalization of some sexual preferences; two, structural barriers, such as inadequate access to sexual and reproductive health education; and number three, societal factors, such as the language used in medical context to describe risky sexual behaviors.

Furthermore, globally syphilis screening rates among women receiving antenatal care are only 66% percent, indicating missed opportunities for testing within this group. So, it is unclear whether these missed chances are due to an increase in screening refusals or a complete lack of screening. So, women may refuse screening for various reasons including limited awareness of syphilis' consequences during pregnancy and a perception of low risk. Additionally, subpar antenatal care may contribute to this gap due to capacity issues, inadequately provided education, and failure to offer testing. So, all of those factors combined in their timely testing of syphilis and treatment during pregnancy.

Bob Barrett: I'd like to go back to something you touched on just a bit earlier. Could you elaborate a bit on how health disparities are contributing to this rise in congenital syphilis cases?

Kayode Balogun: I believe to address the rising congenital syphilis cases effectively it is essential to acknowledge the various socioeconomic and behavioral factors driving the increase in maternal syphilis rates. So, it is well-known that racial and ethnic minority groups are disproportionately affected by this issue. For example, in 2021, babies born to Black, Hispanic, or American Indian Native mothers were up to eight times more likely to have congenital syphilis compared to those born to White mothers. So, these disparities are rooted in longstanding social determinants of health that create significant barriers to accessing quality healthcare, leading to health inequities such as high rates of syphilis in certain communities.

Additionally, the surge in congenital syphilis cases in places like Mississippi reflects broader public health challenges, including a rise in newborn hospitalization linked to maternal substance abuse. So, this highlights the interconnected nature of different public health crisis, such as the current drug epidemic with a spike in cases of congenital syphilis.

Bob Barrett: Well, finally, let's look ahead. How can we address this increase in congenital syphilis cases, and what strategies can be used to enhance screening during pregnancy?

Kayode Balogun: Congenital syphilis can be prevented simply through timely testing and effective treatment during pregnancy. To address disparities, a newborn syphilis, tailored prevention strategies are essential. Preventing congenital syphilis requires robust antenatal healthcare systems with thorough surveillance, screening, testing and treatment protocols. Each prenatal visit presents an opportunity for testing and intervention. There are different recommendations to enhance screening during pregnancy. For example, the CDC recommends screening for syphilis during the first prenatal visit. If access to prenatal care is limited, screening and treatment should occur as soon as pregnancy is confirmed.

Additionally, the CDC recommends screening at 28 weeks of gestation and a delivery for individuals who, one, live in areas with high syphilis rates; two, are at a higher risk of contracting syphilis during pregnancy; or three, did not receive prenatal testing. In addition to improving access to prenatal care, extending care beyond the traditional clinical settings is also important, particularly in hard to reach populations. So, utilizing trained personnel for active surveillance, rapid testing and ensuring follow-up can help clear syphilis transformation.

Furthermore, in resource-limited settings, point-of-care testing offers significant advantages. This test with great sensitivity and specificity can greatly enhance healthcare delivery compared to traditional methods. So, recognizing this potential, the World Health Organization recommended dual HIV and syphilis point-of-care test as the primary screening approach in 2019. So, this recommendation aims to improve testing capacity and ensure more equitable access. The increased use of the dual point-of-care testing is expected to boost syphilis screening rates, which are behind HIV screening in many countries.

So, overall, to prevent the transmission of syphilis during pregnancy, it is crucial to implement effective policies, update testing guidelines, and develop mitigation strategies to ensure sufficient funding for antenatal screening and testing, including rapid point-of-care test is remote areas and establishing robust health information system to quickly

inform public health authorities of test results are also vital steps.

Bob Barrett: That was Dr. Kayode Balogun from the Montefiore Medical Center in New York City. He wrote a News & Views article on congenital syphilis in the September 2024 issue of *Chemical Chemistry*, and he has been our guest in this podcast on this topic. I'm Bob Barrett. Thanks for listening.