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## ORIGINAL RESEARCH

### Syphilis Testing in Emergency Department Patients Treated for Other STDs

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#### INTRODUCTION:

Syphilis remains a common sexually transmitted disease (STD). In 1995, among individuals between the ages of 15 to 49, there were 12 million cases of syphilis worldwide<sup>1</sup>. The number of cases reported in the United States, however, is relatively small, with only 6,993 cases reported to the Centers for Disease Control in 1998<sup>2</sup>. This figure is the lowest number of cases reported in the last thirty years, a dramatic 90% decline from the 50,233 cases reported in 1990<sup>3</sup>. While this decline may appear reassuring, historically syphilis has been a disease of variable incidence with a pattern of epidemics emerging after periods of steady decline. A number of factors contribute to the variable rates of this disease. In the 1980s major contributing factors were the emergence of Human Immunodeficiency Virus (HIV) and the increased use of illicit drugs such as crack cocaine.

A universal challenge to the control of syphilis relates to its tendency to persist in a clinically undetectable, asymptomatic stage for an extended period of time. Beyond the spread of disease to

other sexually active adults, asymptomatic disease presents a threat to the unborn child. During the last epidemic in the 1980's the incidence of congenital syphilis increased 178 to 777 percent in different regions of the US<sup>4</sup>.

The only means of syphilis detection in the latent stages is by serologic testing. As different STDs share common epidemiology and modes of transmission, the CDC recommends empiric syphilis serology testing for patients diagnosed with other STDs such as gonococcal urethritis<sup>5-7</sup>. Previous studies of emergency department patients have reported prevalence rates of asymptomatic syphilis of three to eleven percent making the ED a preferred site for screening<sup>8-10</sup>. The objective of this study was to determine how well emergency physicians comply with the CDC recommendation for syphilis serologic testing in patients diagnosed with STDs.

#### METHODS:

This study was reviewed and approved by the Medical Center Committee on Investigations Involving Human Subjects.

Study setting: University hospital ED with an annual census of 38,000 patient visits, staffed by residents in emergency medicine and other specialties and supervised by faculty board certified in emergency medicine. The ED population studied is multicultural and socio-economically diverse.

Study design: A retrospective chart review of all patients diagnosed and treated in the ED with any of the following STDs: pelvic inflammatory disease, cervicitis, urethritis, gonorrhea, chlamydia, genital herpes, genital warts, or STD unspecified. During the period of study all ED patient infor-

mation was recorded in an electronic medical record. Charts were selected by searching the electronic database for the period from January 1995 through September 1997 for all patients with any of the above STDs listed as one of the discharge diagnoses. Three investigators reviewed all the charts and recorded patient age, sex, discharge diagnosis, treatment, and order for serologic testing for syphilis (VDRL or RPR). All screening syphilis tests, as well as confirmatory serology test results, were obtained from subsequent review of hospital laboratory data.

Statistical analysis: Chi square test was used to compare rates of serology testing performed on male and female patients.

## RESULTS:

A total of 308 patients were diagnosed and treated for STD in the ED during the study period. There were 101 male patients and 207 females. The average age of male and female patients was 27.2 +/-

11.3 years and 27.4 +/- 14.0 years respectively. The discharge diagnoses are summarized in Table 1.

Syphilis serology testing was performed in 113 (37%) of all patients. Fifty two females (25%) with STD had syphilis testing as compared to 62 (61%) of males ( $p < 0.0001$ ). Among the 113 patients who received either a VDRL or RPR, four (3.5%) had positive results. Three of the positive tests were in male patients and one was in a female patient. Confirmatory serology testing (treponemal pallidum microhemagglutination antibody) was performed on the four positive screening tests. Three of the four treponemal specific tests were positive.

## DISCUSSION:

This study demonstrates a poor rate of compliance by emergency physicians with CDC recommendations for empiric syphilis serology screening of patients diagnosed and treated for STD. In this study 63% of patients diagnosed with a STD were not properly screened. Applying the confirmed seropositivity rate of 2.7 % in the screened population to those not tested results in the possibility that five patients with latent syphilis may remain undiagnosed and untreated. There is significant health consequence associated with this finding, both from the perspective of direct patient morbidity as well as unwitting disease transmission. We also noted an unanticipated dramatic difference in the rate of syphilis testing between males and females. The reasons for this difference were not addressed by the design of the study nor are they discernable from the data collected. In 1999,

**Table 1 - Demographics and STD Diagnoses**

<b><u>Total Number of Patients</u></b>	308
Male	101
Female	207
<b><u>Average Age +/- SD (Years)</u></b>	
Male	27.2 +/- 11/3
Female	27.4 +/- 14.0
<b><u>STD Diagnoses</u></b>	
PID	159
STD-not specified	60
Urethritis	53
Cervicitis	29
Genital Herpes	7

SD = standard deviation; STD = sexually transmitted disease; PID = pelvic inflammatory disease

Garfinkel and Blumstein reported a similar disparity between empiric testing for syphilis in an emergency department population<sup>11</sup>. In that study 48.9% of males were screened compared to 7.4% of females. An earlier study by Kirsch et al also found a significant difference in screening rates for males and females<sup>12</sup>. A possible explanation for the difference may be related to the nature of the STD diagnosed in females. Pelvic inflammatory disease is the most common STD diagnosis in women and this diagnosis is made largely on clinical grounds. Objective findings such as purulent urethral discharge, characteristic of the most common STD in males— urethritis, are often absent. As a result there may not be as strong a trigger for consideration of a true STD and the need for syphilis testing thereby less likely to be considered. An alternative explanation may be that the often speculative nature of the diagnosis of PID may make an emergency physician less likely to raise the specter of another STD with perceived greater social stigma. A third explanation may relate to some bias toward women and their healthcare. While this is felt to be unlikely, gender variation in other arenas of healthcare have been well described and cannot be excluded as a cause<sup>13,14</sup>.

The low frequency of empiric screening in women is of special concern because of the risk of congenital syphilis. In the 1980s the incidence of congenital syphilis mirrored the rise of syphilis in the adult population. A more recent outbreak in Baltimore in 1996-97 again demonstrated the apparent association between an increase in primary and secondary syphilis cases and increase in congenital disease<sup>15,16</sup>.

The ED may be the only site for care for many financially disenfranchised patients creating a unique opportunity for screening of occult diseases with public health impact. Other studies have demonstrated that syphilis screening in an ED may be performed with relatively low costs. Estimated costs have ranged from \$105 to \$565 per detected case depending upon prevalence of disease in the population studied<sup>8,10,17,18</sup>. An analysis at our institution yielded a charge per positive case identified of \$583 based upon a patient charge of \$15.50 for RPR testing (2002 charge data). This amount is consistent with the values identified at other institutions and compares very favorably with the \$240,000 cost per detected case in mandated premarital screening programs<sup>19</sup>.

The findings in this study, while strictly applicable to the study institution, are similar in many respects to investigations conducted elsewhere. Unpublished data from a multi-institutional ED study by one of the authors and conducted in the same community as the present investigation, yielded even lower overall rates of compliance with syphilis screening recommendations. It is likely that the experience reported here is applicable to many emergency department settings. Assessment of empiric screening for syphilis in other ambulatory care settings such as public health clinics and private physician offices has not been reported. Whether it mirrors the experience reported here is unknown and certainly warrants further investigation.

The retrospective nature of this study does create several obvious limitations. We cannot assure that all cases of STD encountered during the study

period were captured. It is possible several cases were missed which may have skewed the data. Furthermore, chart review cannot guarantee that all interventions were identified. Some patients may have had syphilis serology but the order for the test and a nursing note indicating a blood draw may have been absent or overlooked. Nevertheless it is very unlikely that either of these events occurred to a degree sufficient to have altered the overall impact of the results.

### CONCLUSIONS:

Screening for syphilis in patients diagnosed and treated for a STD in the study institution occurs in a minority of patients. The rate of screening is significantly lower for women than it is for men. This likely contributes to delayed or missed diagnosis of syphilis in a small but significant number of patients. Based upon the number of cases of latent syphilis identified in this study, empiric screening for patients with STD in this ED population is cost effective.

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