

Cocaine/crack use could also lead to a decreased use of prenatal care, thereby causing missed opportunities for the detection and treatment of syphilis (38% of case mothers who used cocaine/crack had no prenatal care). The lower socioeconomic status of cocaine/crack-using mothers could be associated with a decreased availability of health services for this population, or with inadequate services. Among women who gave birth to babies with congenital syphilis in NYC who were reported in 1989 and who were documented to have received prenatal care, only a small proportion were documented to have received treatment for syphilis during their pregnancy.¹⁴ Since so few delivering women received treatment for syphilis, treatment failure is probably not an important factor in the increase of congenital syphilis cases.

The provision of accessible and adequate prenatal health care, along with ed-

ucation targeted to women who engage in high-risk sexual activities, is needed to confront the epidemic of congenital syphilis in NYC. □

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Human Papillomavirus, Gonorrhea, Syphilis, and Cervical Dysplasia in Jailed Women

ABSTRACT

We assessed the prevalence of human papillomavirus (HPV) by cervicovaginal lavage and Southern blot and inquired about behavioral risk factors for cervical disease and sexually transmitted diseases by interview in 114 female detainees at a large New York City jail. Of the women screened, 8% had abnormal Pap smears, 35% had HPV, 7% had gonorrhea, and 22% had serologic syphilis. Given the high rates of HPV infection and cervical cytology, Pap smears should be a routine intake procedure for incarcerated women. (*Am J Public Health*. 1991;81:1318–1320)

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Introduction

Prisoners have a high prevalence of drug use, psychiatric disorders, trauma, alcohol abuse, and chronic medical conditions such as respiratory diseases and hypertension.^{1,2} The number of incarcerated women in the U.S. increased 53% between 1983 and 1987.³ At our study site the number of female prisoners has more than doubled in the last 5 years (*SS:unpublished data*).

Prevalence rates as high as 10% for cervical carcinoma in situ, 16% for syphilis, and 5% for gonorrhea have been reported in incarcerated adult women.^{4–7} No studies of human papillomavirus (HPV) have been published. Because prisoners have high rates of drug use and prostitution,³ many are likely to have been exposed to the human immunodeficiency virus (HIV) through these routes.⁸ Women

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with HIV may have higher risk of HPV-associated cervical cytologic abnormalities.⁹

We undertook a cross-sectional study of the prevalence of HPV, gonorrhea, syphilis, and cervical cytology in imprisoned women, examined selected behavioral risk factors for HPV and other sexually transmitted diseases (STDs), and looked for any association of HPV with cervical abnormalities in this population.

Methods

All female detainees at the New York City Correctional Institute for Women undergo an intake examination at the Montefiore Medical Center/Rikers Island Health Service, which provides comprehensive health care to the Rikers Island Jail complex on a contractual basis with the New York City Department of Health. During four nonsuccessive weeks in 1988, eligible female detainees were asked to participate in this study. Eligibility criteria included age less than 50 years, ability to speak English, an intact uterine cervix, history of heterosexual relations, and competency to give informed consent.

The usual medical intake evaluation includes standardized medical history and a physical including pelvic exam and laboratory tests for TB, syphilis, gonorrhea, pregnancy, and a Pap smear. Those who agreed to participate also received a structured interview before the usual intake and cervicovaginal lavage for HPV.¹⁰ The structured interview elicited additional information about sexual and medical histories. Demographic data of participants and nonparticipants were abstracted from the standardized prison medical charts.

All lab analyses were conducted in a blinded fashion. For analytic purposes, normal Pap smears and those showing only atypia with inflammation were considered "no significant pathology"; those classified with atypia and mild dysplasia, or Class III or IV, were considered abnormal in accordance with the Bethesda cytologic classification system.¹¹ Syphilis serology was evaluated by rapid plasma reagent tests and, if positive, by fluorescent treponemal antibody (FTA) tests. *Neisseria gonorrhoeae* samples were obtained from the endocervix with a cotton swab and cultured on Thayer Martin plates. HPV DNA was extracted from exfoliated cervicovaginal cells collected by lavage. DNA was digested with a *Pst* I and resultant DNA fragments were separated by gel electrophoresis. HPV DNA was detected by Southern blot analysis

Partners, y (n)	OR of Condom Use (95% CI)	OR of HPV Infection (95% CI)
0-1 (54) ^a	1.0	1.0
2-5 (34)	4.1 (0.66-26.1)	1.1 (0.4-2.9)
6-24 (14)	23.7 (6.1-92.1)	2.7 (0.8-9.6)
≥25 (11)	61.5 (13.5-280.3)	1.5 (0.4-5.6)

^a0-1 partners = referent group.
 Note: ORs are age adjusted; CI = confidence interval; Among women with 25 or more partners in the last year, 73% used condoms and 36% were infected with HPV. Among women with 6-24 partners in the last year, 50% used condoms and 57% were infected with HPV.

with a mixed probe containing radiolabelled HPV 11, 16, 18, and 31 DNA initially under low stringency and following hybridization, under moderate stringency conditions according to techniques previously published.¹⁰ Statistical calculations included odds ratios (ORs) and Mantel-Haenszel OR_{MH} to measure strength of association.

Results

Of 145 detainees, 130 met inclusion criteria, and 114 (88% of eligible women) agreed to participate. The most common reason given for refusal was belief that they were not infected; the most common reason for exclusion was a history of hysterectomy. Participants' (N=114) average age was 26.6 years (standard deviation [SD] ± 6.2 years); 53% were Black, 30% Hispanic, and 17% White. Nonparticipants' (N=16) average age was 27.2 years (SD ± 6.8 years); 62% were Black, 25% Hispanic, and 13% White. Sixty-eight percent of the women acknowledged use of some drug, 53% admitted to habitual use of cocaine, and 99% smoked cigarettes.

The median number of reported sexual partners in the last year was 1 (range = 0-2500). Fifty-six percent of the women stated they knew their sexual partners had other sexual partners. The mean age at first coitus was 15 years. Forty women (35%) practiced contraception: 32 used condoms, 5 had tubal ligations, 2 used IUDs and 1 used contraceptive sponges. None used oral contraceptives. Of women using condoms, 80% used them "most" or "all the time." A trend of increased condom use was observed among women with greater numbers of sexual partners (Table 1).

STDs were common: 7% of the women (8/111, 3 missing) had positive gonorrhea cultures, and 22% (24/108, 6 missing) had positive FTA. HPV was the most prevalent STD: 35% of the participants (40/114) were infected.

Pap smears were abnormal in 9% of the women (9/104, 10 missing). There were no cases of invasive cervical cancer. Five of nine women with abnormal Pap smears (56%) were infected with HPV compared to 30 of 95 (32%) women without significant Pap smear pathology (OR = 2.7, 95% confidence interval [CI] = 0.7-10.4). HPV type was not associated with Pap smear abnormality (*R.D. Burk; unpublished data*). The common HPV type prevalence rates were 28% types 16 and 18, 10% type 42, 2% types 6 and 11, and 35% "related" types. Younger women (≤25 years) were more frequently HPV infected (OR = 2.0, 95% CI = 0.9-4.5) and were more likely than older women to have had 2 to 24 sexual partners in the previous year (OR = 2.4, 95% CI = 1.01-5.8). There was an unstable relationship between age and HPV infection when number of sexual partners was controlled for (OR_{MH} = 1.8, 95% CI = 0.8-4.1).

Discussion

In 1988, the typical female detainee at Rikers Island was a woman in her mid-20s who engaged in multiple potentially harmful behaviors, including cigarette smoking, cocaine use, sexual activity by age 15, more than one sexual partner in the last year, and low frequency of condom use. The prevalence of STDs and abnormal Pap smears among the women inmates is of a magnitude similar to that of other studies in young inner city and prison women.¹²⁻¹⁴ The marked frequency of condom use in highly sexually active women is probably associated with prostitution. The high HPV prevalence may be related to sensitive cell sampling and DNA detection methods.¹⁵ Although this study did not assess incidence through repeated testing, such studies would be desirable.¹⁶

The majority of these women did not practice safe sex; 72% had not used condoms. These rates of condom use are sim-

ilar to those reported among juvenile detainees.¹³ High STD rates and low use of barrier contraception are particularly disturbing given the prisoners' increased risk of infection with HIV^{17,18} and the increased risk of HPV-associated cervical cytologic abnormalities in immunocompromised women.^{9,19}

These data suggest the need for universal Pap smear and STD screening of women in prisons and jails, careful follow-up of women with abnormal Pap smears and those who may be HIV positive, and health education for barrier contraception and STD prevention. □

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