A B S T R A C T

Objective: To review a 1995 Pap smear screening program at Burnaby Correctional Centre for Women (BCCW).

Method: 129 inmates (15%), were screened in BCCW in 1995. General population data were obtained from the British Columbia Cervical Cytology Screening Program (BC CCSP) Registry.

Results: BCCW inmates aged 25-29 years were 11 times more likely to have high grade cytologic abnormalities on Pap smear screening compared with age-matched general population ($p<10^{-10}$). In the 20-34 year age group, 47% of BCCW inmates had received at least one Pap smear in 1992-1994, compared with 87% of the general population ($p<0.001$). There was no relationship between Pap smear results and BCCW inmate ethnicity ($p=0.85$).

Conclusions: Prison inmates presented with more severe abnormalities on Pap smear screening at a younger age, and had received Pap smear screening less frequently, compared with the general population.

A B R É G É

Objectif : passer en revue un programme de dépistage par frottis mené en 1995 au Centre correctionnel pour les femmes de Burnaby.

Méthode : 129 détenues (15 %) ont eu un dépistage par frottis au Centre correctionnel en 1995. Les données démographiques générales ont été fournies par le registre du programme de dépistage de la cytologie cervicale de la Colombie-Britannique.

Résultats : les détenues du Centre correctionnel âgées de 25 à 29 ans avaient onze fois plus de chance de présenter des anomalies cytologiques graves lors du frottis que la population générale du même âge ($p < 10^{-10}$). Dans la catégorie des 20 à 34 ans, 47 % des détenues avaient eu au moins un frottis en 1992-1994 en comparaison avec 87 % de la population générale ($p < 0{,}001$). On n'a pas observé de lien entre les résultats des frottis et l'ethnicité des détenues du Centre correctionnel ($p = 0{,}85$).

Conclusions : en comparaison avec la population générale, un plus grand nombre d'anomalies graves ont été dépistées par frottis chez les détenues à un âge plus précoce, et les dépistages par frottis sont moins fréquents chez les détenues.

A Review of a Prison Cervical Cancer Screening Program in British Columbia

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Known risk factors for cervical cancer include early age at first intercourse or first pregnancy, multiple sexual partners, exposure to human papilloma virus, cigarette smoking, immunosuppression of any cause including HIV infection and prior or concomitant neoplasia of the vulva or vagina.[1-3] In addition, the risk of death from invasive cervical cancer is highest in women who have not participated in Pap smear screening programs or in women in whom the interval between Pap smears is long.[4] Current Canadian recommendations for Pap smear screening stipulate that all women age 18 and over, or after first sexual intercourse, be screened annually for the first two years and if these smears are negative, the women should be rescreened every three years (two years in BC) to age 69.[1,5]

Previous studies have reported an increased rate of cervical intraepithelial neoplasia and invasive cervical cancer in female prison inmates compared with the general population in the same area.[6-9] The Burnaby Correctional Centre for Women (BCCW) is the only prison in British Columbia for adult female offenders. In January 1995, a Pap smear screening program was introduced at BCCW. The purpose of this paper is to document the results of this program, to compare these results with those of the general population, and to compare characteristics of those BCCW individuals who did, and those who did not, receive a Pap smear in BCCW in 1995.

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MATERIALS AND METHODS

All inmates in BCCW at any time in 1995 were asked, by way of a form circulated by the nurses (Figure1), if they would like to have a Pap smear. Those who accepted were booked for an evening Pap clinic with a female physician. Pap smears were also performed during regular physicians' clinics if required as part of a gynecological assessment (Figure 2). All Pap smears were processed and read at the British Columbia Cancer Agency (BCCA) cytology laboratory. Individuals warranting colposcopy were referred to the Women's Clinic at Vancouver Hospital and Health Sciences Centre.

The 1995 BCCW Pap smear results were compared with 1995 Pap smear results of the general population using data from the BC CCSP Registry. Patient histories, which detail all past Pap smear results, were obtained for the BCCW inmates, using computer linkage of name, aliases and date of birth; questionable matches were examined by a manual check of the registry.

Using the 1995 admissions list of the Detail Event Records (Corrections Branch, Ministry of the Attorney General), the BCCW unscreened group (N = 214) was identified by a systematic sampling of the list, after the names of those who received a Pap smear in BCCW in 1995 were excluded from the list. Ethnicity was obtained using the 1995 Detail Event Records.

RESULTS

Eight hundred and forty-nine (849) individuals were inmates in BCCW at some point in 1995. One hundred and

thirty-five (135) Pap smears were performed on 129 (15%) of these women.

Sixty-six percent (66%) of the Pap smears resulted in a recommendation for a repeat smear in 12 to 24 months, 20% for a repeat smear in 6 months and 5% for a repeat smear after the obscuring inflammation had been treated. Thirteen (13) patients were referred to Vancouver Hospital and Health Sciences Centre for colposcopy.

At colposcopy, one patient was diagnosed with squamous cell carcinoma of the cervix with microinvasion and was treated subsequently by hysterectomy, and five patients with moderate or severe dysplasia were treated with laser or loop excision procedures of the cervix. At time of colposcopy, one patient was noted to have mild dysplasia, one patient was pregnant so that biopsy was deferred and one patient's colposcopy examination was indeterminate (she subsequently received a cone biopsy). Two patients with severe dysplasia noted at colposcopy were recommended for cone biopsy: 18 months later one of these patients had not been treated; the other had received laser treatment. Two patients who were recommended for colposcopy had not had colposcopy 24 and 30 months later.

Of the 129 inmates, 94 were Caucasian and 31 were First Nations; their Pap smear results are shown in Table I. The other 4 inmates were either black or Asian and were excluded from analysis of ethnicity. Of the First Nations inmates' Pap smears, 45% were negative compared with 59% of the Caucasian inmates' Pap smears (X_2^2=0.612, p=0.85). Of the Caucasian inmates, 49% had had a Pap smear within the years 1992-1994, compared with 65% of the First Nations inmates (X_1^2=1.68, p=0.20).

Comparison to the general population

Table II presents the BCCW 1995 Pap smear results by age groups compared with the general population. For all age groups, a higher proportion of smears showed high grade lesions in inmates as compared with the general population.

In 1995, 87% of the 20 to 34 year old age group in the general population had received at least one Pap smear within the

TABLE I
Ethnicity Related to BCCW Pap Smear Results and the Number of Years since Last Pap

Ethnicity*	Result of Pap Smear: Negative	Mild/ Benign	Mod/Marked/ Malignant	1-3 Years since Last Pap†
Caucasian (N=94)	58.5% (55)	28.7% (27)	11.3% (10)	48.9% (46)
First Nations (N=31)	45.2% (14)	29.0% (9)	12.9% (4)	64.5% (20)
			χ_2^2=0.612 p=0.85	χ_1^2=1.68 p=0.20

* Ethnicity was obtained from Detail Event Records, 1995-1996, Corrections Branch, Ministry of Attorney General.
† Date of last Pap smear was obtained from patient histories from the British Columbia Cervical Cytology Screening Program registry.

TABLE II
BCCW Pap Smear Results in 1995 Compared with the General Population

1995 Pap Smear Results	Age 20-24 yrs BCCW (N=29)	Age 20-24 yrs G. popn*	Age 25-29 yrs BCCW (N=32)	Age 25-29 yrs G. popn*	Age 30-34 yrs BCCW (N=32)	Age 30-34 yrs G. popn*
Negative	34.5% (10)	77.2% (54,710)	37.5% (12)	80.0% (71,644)	84.0% (27)	81.4% (77,782)
Mild/Benign	48.3% (14)	14.3% (10,159)	37.5% (12)	11.8% (10,595)	15.6% (5)	11.2% (10,687)
Moderate/Marked/ Malignant	10.3% (3)	2.3% (1,642)	21.9% (7)	1.9% (1,741)	0% (0)	1.4% (1,347)
Unsatisfactory	6.9% (2)	5.6%	3.1% (1)	5.5%	0% (0)	5.0%
	χ^2=999.00 $p=10^{-10}$		χ^2=127,619 $p=10^{-10}$		χ^2=999.00 $p=10^{-10}$	

* General population Pap smear results were obtained using data from the British Columbia Cervical Cytology Screening Program 1995 Cytology Atypia Reports.

TABLE III
Number of Years since Last Pap in 20-34 Year Old Age Group - BCCW Screened Group, BCCW Unscreened Group and the General Population

Number of Years since Last Pap Smear in 20-34 Year Age Group	BCCW Screened in 20-34 yr Age Group * (N=91)	BCCW Unscreened in 20-34 yr Age Group* (N=118)	General Population in 20-34 yr Age Group BC/Yukon/NWT† (N=429,400)
0 years (1995)	11.0% (N=10)	18.6% (N=22)	
1-3 years (1994-1992)	53.9% (N=49)	41.6% (N=49)	87%‡ (N=374,027)
4-14 years (1991-1978)	15.4% (N=14)	19.5% (N=23)	N/A
Never	19.8% (N=18)	20.3% (N=24)	N/A
	χ_2^2=4.12 2.366<p<6.251		χ_1^2=11.57 p<0.001

* Date of last Pap smear was obtained from patient histories from the British Columbia Cervical Cytology Screening Program registry.
† General population Pap smear results were obtained using data from the British Columbia Cervical Cytology Screening Program 1995 Cytology Atypia Reports.
‡ Unpublished data, Cytology Lab, BCCA.

TABLE IV
BCCW Screened Group and BCCW Unscreened Group Compared by Ethnicity

Ethnicity*	BCCW Screened (N=129)		BCCW Unscreened (N=214)	
	%	(n)	%	(n)
Caucasian	72.9	94	72.0	154
First Nations	24.0	31	22.9	49
Black	1.6	2	0.9	2
Asian	1.6	2	4.2	9
	χ^2=0 p=1.0			

* Ethnicity was obtained from Detail Event Records, 1995-1996, Corrections Branch, Ministry of Attorney General.

TO ALL INMATES

Have you had a pap test recently? If not, and you would like to have one done, please fill in the form below and return to the nurse.

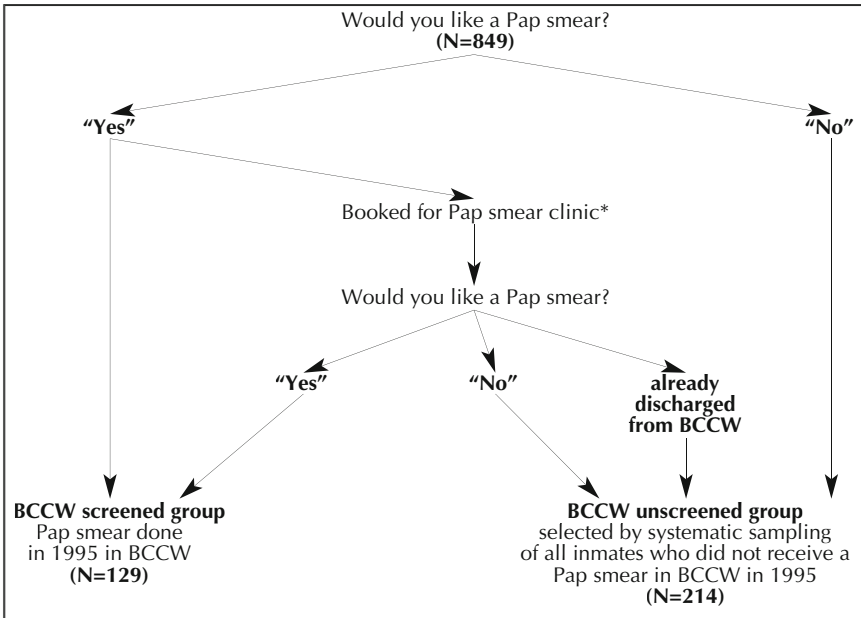
Pap tests are done to check for cancer of the cervix. This cancer grows slowly and can be cured if detected early enough by a pap smear.

At the time of your pap smear you can also ask to be checked for infections, such as yeast or chlamydia.

YES NO

NAME

Figure 1. Pap Smear Invitation Form which was given by the nursing staff to all 1995 Burnaby Correctional Centre for Women inmates and to all inmates who were admitted to BCCW during 1995



* Pap smear clinic held by a female family physician every 2 to 4 weeks.

Figure 2. Flow chart of the 1995 Burnaby Correctional Centre for Women Pap smear screening program

years 1992-1994,[10] compared with 54% of the same age group in the BCCW screened group (X_1^2=11.57, p<0.001) and 42% of the BCCW unscreened group (Table III).

Comparison of BCCW screened group with BCCW unscreened group

In the group who received a Pap smear in 1995, the mean interval from date of admission to date of Pap smear was 84.5 days. According to the Detail Event Records, 45% of the BCCW unscreened group are noted as having had a maximum sentence in 1995 of 0 days compared to 26% of the screened group. A sentence of 0 days means that the inmate is admitted to BCCW while remanded in custody as they await bail or sentencing hearings or trial. Their stay in BCCW varies from overnight to several weeks, but is generally less than 14 days.[11] The mean maximum 1995 sentence length was 325 days in the BCCW screened group compared with 200 days for the BCCW unscreened group.

Twice as many of the BCCW screened group (25%) as of the BCCW unscreened group (13%) had a past history of a positive Pap smear (X_1^2=4.3, 0.05>p>0.025). A past history of a positive smear was defined as a previous Pap smear result which recommended intervention, such as colposcopy or D&C, regardless of whether the patient received the intervention. There was no difference between the unscreened and the screened group in the percentage who had never had a Pap smear.

Table IV documents the essentially similar ethnic distribution between the screened and unscreened group of women at BCCW. Mean age for the two groups was also similar at 30.71 years for the screened group and 31.82 years for the unscreened group.

DISCUSSION

Comparison to the general population

BCCW inmates aged 25 to 29 years had the greatest frequency of high grade (moderate, marked or malignant) cytologic abnormalities on Pap smear screening compared with women matched for age in the general population. In general, women

inmates presented with more severe abnormalities on Pap smear screening at a younger age than patients in the general population. Is this because the BCCW population is at higher individual risk for cervical dysplasia at an earlier age than the general population, or because the inmate population has not benefited at an earlier age from regular Pap screening and treatment of abnormalities? If the Pap screening program at BCCW expands to screen a greater percentage of the inmates, this question will eventually be answered, because a certain percentage of inmates return to jail. In 1995, 38% of the inmates had been in prison at least once within the previous two years; 64% of the inmates had been in prison at least once before in their lifetime.[11]

Comparison of the BCCW screened group with the BCCW unscreened group

The BCCW screened group was more likely to have received a Pap smear in the years 1992-1994 than the BCCW unscreened group, although both groups were less likely to have received a Pap smear during this period than the general population. However, some smears may not have been identified in the inmate population due to mismatching of name changes, aliases or different spellings; also the BC CCSP registry only records patient histories of those who have previously received a Pap smear in British Columbia, not in other provinces or countries.

A high percentage of BCCW inmates (85%) did not receive a Pap smear in BCCW in 1995: some wanted to have a Pap smear but were discharged prior to an available Pap smear clinic, some initially stated they wanted to have a Pap smear but declined on the evening of the Pap smear clinic evening and some refused to have a Pap smear. This paper does not distinguish among these three groups (Figure 1).

The longer their sentence, the more likely inmates were to have received a Pap smear in BCCW in 1995. Almost half of the inmates who did not receive a Pap smear had a maximum sentence in 1995 of 0 days. If Pap smear screening at BCCW is to be more effective, Pap smears should be made available to the inmate shortly after her admission.

Participation in Pap smear screening programs is assisted by individual knowledge of the benefits of such activities.[12-14] A past history of previous positive Pap smears implies that the woman has greater experience with Pap testing and may have received more education about its significance. Twice as many women who received a Pap smear in BCCW in 1995 had a past history of previous positive Pap smears compared with the women who did not receive a Pap. At present there is no cervical cancer educational program for inmates at BCCW.

In this inmate population, no relationship was observed between ethnicity and receiving a Pap smear at BCCW in 1995, in the Pap smear results, or in the number of years to the last Pap smear. This is an interesting observation in light of the fact that the mortality rate from cervical cancer among First Nations women in British Columbia is significantly higher than for the general population, and that the provincial screening program does not reach as many First Nations women as it does the general population.[15,16]

Further work is needed

Further study is needed at BCCW to establish the prevalence of known risk factors for cervical cancer in this population and to determine if other social or lifestyle factors are involved, such as childhood sexual abuse or injection drug use.

In order to improve the Pap screening rate at BCCW, the reasons why inmates refuse to have Pap smears need to be explored. Fear and embarassment, lack of knowledge about cervical cancer, cultural issues, ambivalence or denial and older age have all been reported in the literature,[13-17] but there may be others.

Follow-up for an abnormal screening result is difficult, as inmates are often released from BCCW to a transient lifestyle before Pap smear results are available and before colposcopic recommendations are carried out. In 1995, it took about six weeks from date of Pap smear in BCCW to receipt of the BCCA Pap smear report by the BCCW medical clinic. Many inmates stay for less than 14 days. In order to facilitate follow-up of this high risk population, the BCCA cytology laboratory now reports BCCW Pap smears within two weeks; waiting time for colposcopy appointments has similarly been reduced.

Recent studies suggest that there are still opportunities to reduce the occurrence of invasive cervical cancer in Canada by targeting those groups least likely to present for screening.[1,18-20] Prison inmates are at high risk for cervical dysplasia and have low participation in Pap smear screening programs. BCCW, as with other jails,[21] is a "revolving door" for many women with short sentences; these women are often lost to follow-up after prison discharge because of their transient lifestyles. Canadian cancer prevention resources could be used to develop a prison cervical dysplasia and cancer program, including education, screening and treatment, which is designed to meet the needs of inmates.

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