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FREQUENCY OF CANCER OF THE CERVIX IN A WEST VIRGINIA COUNTY

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THE frequency of cancer of the cervix within a geographically defined area offers a valuable guideline in assessing the need for Papanicolaou smear screening efforts in that area. The asymptomatic nature of cervical carcinoma *in situ* and early stages of invasive cervical carcinoma, however, preclude a precise determination of the true frequency or rate of this potentially fatal disease, particularly in an area devoid of an intensive cancer detection campaign.

In such a county, the authors report the frequency of cervical cancer in terms of incidence and period prevalence rates, and discuss the inherent difficulties in assessing the importance of the disease by comparing rates from other sections of the country.

Materials and Methods

The Pathology Department of a major referral medical center, located in an adjacent county,

examined all tissues obtained from patients who resided in the study county. That department's pathology files were searched for cancer of the cervix diagnoses in 1968, and each patient's county of residence was confirmed. In addition, medical records from the West Virginia Tumor Registry and from hospitals and physicians in and adjacent to the study county were checked for cases of cervical cancer newly diagnosed or already existing in 1968. We believe this to have been a reasonably complete and exhaustive search of the known cases.

A population estimate of county females for 1968 was determined by linear interpolation of the 1960 and 1970 poplation censuses.[1] From an estimated total of 13,051 female residents in 1968, 8,085 were age 20 or older which included 5,850 who were over 34 years of age.

Results

In 1968, there was a total of 16 new and previously diagnosed cases of cancer of the cervix (International list No. 180 and No. 234.0).[2] Table 1 gives a breakdown by type of cancer and age. Only one patient, who had carcinoma *in situ* diagnosed prior to 1968, was less than 35 years of age.

The crude incidence and prevalence rates of all carcinoma of the cervix cases was 46/100,000 and 123/100,000 respectively (Table 2). If the population at risk included just females 20 years of age or more (N=8085) or were confined to those 35 years and older (N=5850), the calculated incidence rates would increase to 74 and 103 per 100,000 respectively. In similar fashion, prevalence rates also would appear larger for their respective younger and older populations,

198 and 256/100,000. In all the population age categories, the incidence of invasive carcinoma was five times greater than the incidence of carcinoma *in situ*.

Recognizing errors in sampling when dealing with small numbers of cases within a small population, 99 per cent confidence intervals are provided (Table 2).[4] This means, for example, there is a 99 per cent certainty that the true values for the incidence rate fall between 12 and 120/100,000 and the prevalence rate between 58 and 226/100,000 total population.

Discussion

Period prevalence rates, which reflect both new and previously diagnosed case rates over a period of time, are used in this report to obtain an estimate of the total cervical cancer problem in the study county. By utilizing the prevalence rate one can gain insight into the balance between old and new cases.

The new cases in 1968 (Table 1), from which incidence rates were calculated, probably are under-represented when the isolated life style and rugged terrain of the study county are considered. Virtually all of the study county's new cases are over 35 years of age. In contrast, a number of reported New York City Puerto Rican cervical cancer cases were under 35 years of age.[5] In searching the 1968 surgical pathology records, a substantial proportion of uterine cervix tissues submitted from the study county came from patients over 35 years of age. It would be reasonable to speculate that when diagnostic services related to uterine cervix are sought in the study county, the patients are likely to be older and probably have specifically related reasons for

seeking medical service. Such a concept is consistent with health utilization reports from elsewhere in West Virginia.[6,7]

Table 1

New and Existing Cases of Cancer of the Cervix
"Study" County, West Virginia (1968)

	Cases	*Median Age*	*Age Range*
Total Living Cases	16	47	34-79
Invasive Carcinoma (#180)	9	46	37-79
Diagnosed in 1968 (New Cases)	5		
Diagnosed before 1968	4		
Carcinoma *In-Situ* (#234.0)	7	48	34-75
Diagnosed in 1968 (New Cases)	1		
Diagnosed before 1968*	6		

* One case, age 34 years.

In Papanicolaou screening programs of high risk populations, a large number of new asymptomatic cases are detected initially. In the inflated incidence rate for that screening period, it would not be uncommon for the rate of carcinoma *in situ* to be three to four times greater than that for invasive carcinoma.[8] The study county's cases demonstrate the opposite relationship between new *in situ* and invasive cases (Table 2). Thus, there is additional evidence to support under-representation of cases in the study county.

Incidence rates of cancer in published reports, which are desirable for comparison purposes, are difficult to summarize.[9] A hospital survey in New York City for cancer of the cervix occurred during a heavy immigration of residents from Puerto Rico who may have had previously diagnosed disease. The inclusion of possible old cases among New York City Puerto Ricans may

Table 2

Incidence and Prevalence of Cancer of the Cervix

"Study" County, West Virginia (1968)
Rate per 100,000 Females

	Based on Total Population		*Based on Population Age 20 or More*		*Based on Population Age 35 or More*	
	*Inc.**	*Prev.***	*Inc.*	*Prev.*	*Inc.*	*Prev.*
Cancer of the Cervix	46 (12 to 120)‡	123 (58 to 226)	74 (19 to 193)	198 (93 to 365)	103 (26 to 267)	256 (118 to 482)
Invasive Carcinoma	38	69	62	111	85	154
Carcinoma *In-Situ*	8	54	12	87	17	103

* Incidence Rate (3) $= \frac{\text{Number of Newly Diagnosed Cases x 100,000}}{\text{Average Number of Population at Risk}}$

** Prevalence Rate (3) $= \frac{\text{Number of Existing† Cases x 100,000}}{\text{Average Number of Population at Risk}}$

† Existing Cases = Sum of Newly Diagnosed Cases plus Previously Diagnosed, but Living, Cases.

‡ 99% Confidence Intervals (in parentheses).

have influenced their extremely high crude incidence rate of cervical cancer, 69.9/100,000.[5] This rate, however, does not represent an appropriate age adjustment to a standard population. Such an adjustment helps to compensate for disproportionate numbers of people in any particular age group such as a higher proportion of the elderly in West Virginia as compared with the whole United States population. Age adjusted rates for cervical cancer are 111.1 for New York City Puerto Ricans, 27.8 for Connecticut residents, and 23.6 for rural Iowans,[10] all per 100,000 at risk. Because of the small number of cases from our study county, age adjustments would not be meaningful.

Thus, the likely under-representation of cases and the inability to age-adjust rates permit only a broad approximation of cervical cancer rates in the study county. Nevertheless, the study county's crude rate of 46/100,000 with a possible extreme limit of 120/100,000 (Table 2) provides a sufficient estimate to consider cancer of the cervix a large enough problem to merit utilization of screening procedures.

Christopherson[8] and Parker have discussed the economic feasibility of cervical cancer control. Based on their projections, counties like the study county where crude rate estimates can be considered high, should be able to afford and would greatly benefit from cervical cancer control programs.

Summary

Estimates on the frequency of cancer of the cervix in a West Virginia county were dedetermined to be 46/100,000 (incidence rate) and 123/100,000 (period prevalence rate). The seemingly high rate of cervical cancer based on

crude estimates implies that the study county represents a high risk population which would benefit from an intensive Papanicolaou stain program.

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