Acta Radiologica Oncology 21 (1982) Fasc. 5

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CARCINOMA OF THE UTERINE CERVIX

Incidence and mortality in the Stockholm–Gotland region

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Carcinoma of the uterine cervix has been the object of large-scale mass screening during the last 10 to 20 years in order to find the lesion in a pre-invasive phase which easily could be cured. The incidence of the true carcinoma could thus be decreased which would probably also lead to a decreasing mortality.

The incidence of cervical carcinoma has been reduced in many Western countries during recent years (CRISTOPHERSON et coll. 1976, WALTON 1976, GREEN 1978, HAKAMA 1981). In Sweden a decline in the incidence within younger birth cohorts was reported from the national Cancer Registry (ERICSSON et coll. 1975). The age standardized incidence rate of cervical carcinoma per 100 000 women was 19.7 in 1960 and 13.7 in 1977 (National Board of Health and Welfare 1981). From the USA, Canada, Finland, Great Britain and Iceland a reduction in the mortality of cervical carcinoma has been reported by CHRISTOPHERSON & SCOTT (1977), MILLER et coll. (1976), HAKAMA (1978), MACGREGOR & TEPPER (1978) and JOHANNESSON et coll. (1978), respectively.

The changes in incidence and mortality of cervical carcinoma during the years 1958 to 1978 among women born 1900 to 1944 and living in the Stockholm–Gotland region are now reported.

Material and Methods

Since 1958 all malignant primary tumours diagnosed in Sweden are reported to the Cancer Registry of the National Board of Health and Welfare. Regional registries supply processed data to the central registry.

The data from the Regional Tumour Registry in the Stockholm–Gotland region during the years 1958 to 1978 were analysed. The mean female population in this area was 710 000. Only women with invasive cervical carcinoma born 1900 to 1944 were included. Thus 3 607 cases fulfilled these criteria. Distribution by age is given in Table 1.

Mortality data were based on information from the official statistics and corrected according to the data received by the Swedish Cancer Registry. Deaths from cervical carcinoma among women born 1900 to 1944 during the years 1963 to 1978 numbered 997. Distribution by age appears in Table 1.

Using the incidence and mortality data as nominators and the mean female population for different birth cohorts (5-year intervals) as denominators the 5-year cumulative incidence and mortality rates per 100 000 women were calculated. All women in a certain birth cohort should have had the theoretic opportunity of living through the age groups presented for that cohort. The age groups have been chosen so that 3 diffferent periods of diagnosis (1960–1968, 1965–1973, 1970–1978) and 2 periods of deaths from cervical carcinoma (1965–1973, 1970–1978) could be compared.

Incidence data were purposely gathered 5 years earlier than mortality data. Roughly the main part of

Accepted for publication 25 May 1982.

deaths from cervical carcinoma will occur during the 5-year period following the initial diagnosis. The ratios between the cumulative mortality per 100 000 women in a certain 5-year age group of a specific cohort and the cumulative incidence for the same cohort in the preceding 5-year age group were analysed.

Results

In Table 2 the 5-year cumulative incidence per 100 000 women within different birth cohorts is presented as well as the period of diagnosis. The incidence is successively decreasing among women born 1910 to 1939 in the age groups 35 to 54 years, comparing women within the same age groups. In the age group 30 to 34 years an obvious reduction is only found between the older birth cohort and the 2 younger, i.e. the first period of diagnosis and the 2 others. In the age groups 55 years and older a decrease in incidence is only noticeable in the youngest cohort, i.e. the last period of diagnosis.

The 5-year cumulative mortality in cervical carcinoma per 100 000 women within different birth cohorts 1965 to 1978 is given in Table 3. An obvious and statistically significant (Poisson distribution) decrease in mortality is seen among women born 1910 to 1939 in the age groups 35 to 59 years, comparing 2 successive birth cohorts at the same age.

No difference was found in the older birth cohorts nor in the younger.

Table 4 gives the cumulative mortality in cervical carcinoma per 100 000 women for certain birth cohorts in 5-year age groups in relation to the cumulative incidence per 100 000 women in the preceding age group of the same cohort. This ratio (mortality/incidence 5 years earlier) differs very little within the same age groups, comparing 2 consecutive birth cohorts. However, a slight decrease can be noticed in most age groups. An obvious reduction is found in the cohort born 1935 to 1939 compared with women born 1930 to 1934 at 35 to 39 years of age ($p<0.01$ χ^2).

Discussion

Official screening programs for cervical carcinoma were introduced in the city of Stockholm in 1968 and in the Stockholm and Gotland counties in 1969. These programs were aimed at the female population aged 30 to 49 years and arranged with 4-year intervals. From about 1959 smears were taken at routine gynecologic examinations by many physicians in the Stockholm area. The gradual reduction in cervical carcinoma incidence accounted for in the present analysis started in the birth cohorts and age groups which were the subject of the organized screening programs. Recently (BJÖRKHOLM et coll. 1981) the decrease in incidence of the invasive cervical carcinoma during a 5-year period was shown to be preceded by an increase in detection of in situ carcinomas the 5-year period before.

Survival data from the Annual Report show that the 5-year survival for the different clinical stages of cervical carcinoma have been fairly unaltered during the period analysed. Major changes in the stage distribution at the Radiumhemmet (the only department of gynecologic oncology in the region) occurred between 1955 and 1965 (PETTERSSON et coll. 1981) with an increasing proportion of women with clinical stage I, a decreasing proportion of stages II and III, while stage IV was unaltered.

The reduction in mortality in the present series roughly follows the incidence trend, although the outcome is slightly better than would be explained

Table 1

Number of new cases of cervical carcinoma diagnosed in the years 1958 to 1978 and number of deaths from cervical carcinoma during the years 1963 to 1978 among women born 1900 to 1944

Age	No. of cases	No. of deaths
–24	9	0
25–29	59	10
30–34	191	17
35–39	417	42
40–44	546	105
45–49	613	144
50–54	568	165
55–59	512	163
60–64	349	161
65–69	232	106
70–74	98	69
75–	13	15
Total	3 607	997

Table 2

Five-year cumulative incidence of cervical carcinoma per 100 000 women within different birth cohorts, 1960 to 1978

Birth cohort	Age groups										
	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74
1900–04									249	232	184
1905–09								283	272	223	
1910–14							386	269	206		
1915–19						373	254	214			
1920–24					386	333	180				
1925–29				274	277	188					
1930–34			125	175	139						
1935–39		34	81	119							
1940–44	7	39	76								
	Period of diagnosis										
	1960–68	1965–73	1970–78								

Table 3

Five-year cumulative mortality in cervical carcinoma per 100 000 women within different birth cohorts, 1965 to 1978

Birth cohort	Age groups									
	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74
1900–04									118	127
1905–09								99	105	
1910–14							120*	96		
1915–19						123*	76			
1920–24					107*	83				
1925–29				89*	76					
1930–34			41*	50						
1935–39		10	12							
1940–44	10	8								
	Period of death									
	1965–73	1970–78								

* $p<0.001$.

Table 4

The cumulative mortality in cervical carcinoma per 100 000 women for certain birth cohorts in relation to the cumulative incidence in the preceding 5-year age group for the same birth cohort

Birth cohort	Age groups							
	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69
1900–04								0.47
1905–09							0.35	0.39
1910–14						0.31	0.36	
1915–19					0.33	0.30		
1920–24				0.28	0.25			
1925–29			0.33	0.27				
1930–34		0.33	0.29					
1935–39	0.29	0.15						
1940–44	0.21							
	1965–73/1960–68	1970–78/1965–73						

only by lessened incidence. This may be due to the more favourable stage distribution which is more prominent in the younger age groups.

Many factors indicate that a connection exists between screening intensity and diminished rates of incidence of cervical carcinoma in the Stockholm–Gotland region. However, a corresponding reduction in mortality has not been demonstrated previously. Among the factors which may have an impact on the incidence and mortality rates of cervical carcinoma, screening seems to play a major part.

The risk of finding only clinically 'benign' tumours by screening cannot be supported by the present analysis.

SUMMARY

During the years 1958 to 1978, 3 607 women with invasive cervical carcinoma were reported to the Stockholm–Gotland Tumour Registry. A decreased incidence rate was found among women born 1910 to 1930 when comparing the 5-year cumulative incidence rate for the different birth cohorts at the same age. A reduced mortality was demonstrated in the same way. The impact of large-scale mass screening on the incidence and mortality of cervical carcinoma is discussed.

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