Rising Incidence of Renal Cell Cancer in the United States

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Rising Incidence of Renal Cell Cancer in the United States

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Methods

Persons diagnosed as having kidney cancer from 1975 through 1995 were identified from 9 population-based cancer registries in the SEER program. The study included microscopically confirmed cases of invasive cancers of the kidney parenchyma or kidney, not otherwise specified (International Classification of Diseases for Oncology, Second Edition [ICDO-2] site code C64.9) and renal pelvis (ICDO-2 site code C65.9), excluding nonepithelial tumors (ie, melanomas, sarcomas, and lymphomas). The proportion of cases microscopically confirmed was 10% in UC retirement, 10% in US retirement, and 10% in non-US retirement.

Context

Clinical surveys have revealed that incidental detection of renal cell carcinoma is rising because of increased use of imaging procedures.

Objective

To examine incidence, mortality, and survival trends of renal cell and renal pelvis cancers by age, sex, race, and tumor stage at diagnosis.

Design

Calculation of age-adjusted incidence and mortality rates, along with 5-year relative survival rates, using data from the National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) program.

Setting and Participants

Patients diagnosed as having kidney cancer from 1975 through 1995 in the 9 geographic areas covered by tumor registries in the SEER program, which represent about 10% of the US population.

Main Outcome Measures

Incidence, mortality, and 5-year relative survival rates by time periods.

Results

The age-adjusted incidence rates for renal cell carcinoma between 1975 and 1995 for white men, white women, black men, and black women were 9.6, 4.4, 11.1, and 4.9 per 100,000 person-years, respectively. The corresponding rates for renal pelvis cancer were 1.5, 0.7, 0.8, and 0.5 per 100,000 person-years. Renal cell cancer incidence rates increased steadily between 1975 and 1995, by 2.3% annually among white men, 3.1% among white women, 3.9% among black men, and 4.3% among black women. Increases were greatest for localized tumors but were also seen for more advanced and unstaged tumors. In contrast, the incidence rates for renal pelvis cancer declined among white men and remained stable among white women and blacks. Although 5-year relative survival rates for patients with renal cell cancer improved among whites but not among blacks, kidney cancer mortality rates increased in all race and sex groups.

Conclusions

Increasing detection of presymptomatic tumors by imaging procedures, such as ultrasonography, computed tomography, and magnetic resonance imaging, does not fully explain the upward incidence trends of renal cell carcinoma. Other factors may be contributing to the rapidly increasing incidence of renal cell cancer in the United States, particularly among blacks.

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firmed was more than 90% and varied little during the study period. Cases with racial origin other than black or white were excluded because their numbers were too small for detailed analysis.

For analysis, cancer cases with anatomical site coded as kidney, not otherwise specified, and histological codes of transitional cell, squamous cell, or other papillary carcinomas (ICDO-2 morphology codes 8050-8130) were recoded to renal pelvis cancer. The cases were classified by age (in 5-year age groups up to >85 years), sex, and race. Incidence rates were calculated by summing the number of cases diagnosed during each 3-year period from 1975-1977 to 1993-1995, dividing by the sum of the corresponding midyear population estimates provided by SEER, and multiplying by 100,000 (ie, per 100,000 person-years). Rates were age-adjusted to the 1970 US population using direct adjustment. Trends in incidence rates were evaluated for the seven 3-year periods, along with annual US mortality rates from 1975 to 1995. Figures were prepared by plotting the rates at the midpoint of each 3-year interval on the x-axis and using a logarithm scale for the y-axis so rates of change could be compared visually.9

RESULTS

From 1975 to 1995, there were 31,105 invasive cancers of the renal parenchyma and/or kidney, not otherwise specified, and 4,985 cancers of the renal pelvis diagnosed among whites and blacks in the 9 SEER study areas. During the study period, the age-adjusted incidence rates for renal cell cancer among white men and women were lower than those among black men and women, with rates of 9.6, 4.4, 11.1, and 4.9 per...
100,000 person-years, respectively. The corresponding rates per 100,000 person-years were 1.5, 0.7, 0.8, and 0.5 for renal pelvis cancer, respectively. In contrast with renal cell cancer, incidence rates for renal pelvis cancer were higher among whites than blacks.

Renal cell cancer incidence rates increased between 1975-1977 and 1993-1995 by 2.3% annually among white men, 3.1% among white women, 3.9% among black men, and 4.3% among black women (Figure 1). Since the mid-1980s, the incidence rates for blacks have surpassed those for whites in both sexes. The increases in renal cell cancer incidence have occurred in all age groups (data not shown). In contrast, the incidence rate for renal pelvis cancer has declined slightly among white men and remained stable among white women. The numbers of renal pelvis cancer among blacks were too small for stable estimates of trends.

The greatest increase in renal cell cancer incidence rates occurred for localized tumors, rising annually by 3.8% among white men, 4.7% among white women, 5.0% among black men, and 5.6% among black women (Figure 2). However, rates for more advanced tumors, including those with regional extension and distant metastasis, as well as unstaged tumors, also showed increases in all race and sex groups.

In addition, mortality rates for kidney cancer (subsite specification unavailable) rose between 1975 and 1995 (Figure 3). The increases were more rapid among blacks than whites, consistent with the upward incidence trends and the lack of improvement in survival rates for renal cell cancer among blacks (Table). In contrast, the 5-year relative survival rates for whites generally improved over time. For renal pelvis cancer, the 5-year relative survival rate declined slightly over time among whites, while the survival trend among blacks was unstable due to small numbers.

**COMMENT**

It has been shown that incidental detection of renal cell carcinoma has risen with increased use of imaging procedures, such as ultrasonography, computed tomography, and MRI. Based on our analysis of unpublished data from the Health Care Financing Administration, the use of abdominal or pelvic computed tomography scans or MRI increased steadily from 2622 to 4536 per 100,000 Medicare beneficiaries between 1986 and 1994, a 73% rise during this period. The incidence trends by tumor stage suggest an effect of early detection because the increases in renal cell cancer were most pronounced for localized tumors. However, upward trends were also apparent for more advanced and unstaged tumors. This pattern, along with an increase in the mortality rates for kidney cancer, suggests that the detection of presymptomatic tumors can...
not fully explain the rising incidence of renal cell carcinoma.

We considered the possibility that improvements in subsite specification for kidney cancers may have contributed to the rising incidence of renal cell cancer. This explanation seems unlikely because renal pelvis cancer declined only among white men and the magnitude of change could not have compensated for the increase in renal cell cancer in all race and sex groups. Furthermore, tumor classification also was based on histology, and microscopic confirmation surpassed 90% and changed little over time.

Reasons for the racial disparity in incidence and mortality trends, with more rapid increases among blacks than whites, are not entirely clear. Obesity and hypertension are established risk factors for renal cell cancer and are more prevalent among blacks than whites in the United States. In addition, the prevalence of obesity has varied little among race and sex groups. In the United States, the prevalence of obesity has varied little among race and sex groups.

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The declining incidence of renal pelvis cancer among white men and relatively stable trends among white women and blacks may be explained in part by the decreasing prevalence of 2 major risk factors, cigarette smoking and the use of phenacetin-containing analgesics. The diverse incidence trends for renal pelvis and renal cell cancers underscore the importance of distinguishing between these types of tumors in future descriptive and analytical epidemiologic studies.

In summary, the rapidly rising incidence of renal cell cancer in the United States may be due in part to the increasing detection of presymptomatic tumors, but a real increase is suggested by the upward incidence trend for more advanced tumors and by a corresponding increase in kidney cancer mortality. The increases in incidence and mortality have been greater among blacks than whites, providing clues for further research into the causes and prevention of these tumors.

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REFERENCES


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