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Renal tumors in the second decade of life: results from the California Cancer Registry☆,☆☆

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Abstract

Background: Renal tumors are rare in adolescents and young adults. The aim of this study was to characterize the histologic condition, epidemiology, and survival of renal tumors in patients aged 11 to 20 years old using a large, population-based database.

Methods: The California Cancer Registry was reviewed from the years 1988 to 2004. All renal tumors in patients aged 11 to 20 years old were identified. The data were analyzed with relation to patient age, sex and ethnicity, tumor histologic examination, and actuarial mortality rates.

Results: Seventy-seven primary renal malignancies were identified. Thirty-nine (51%) were renal cell carcinoma, 23 (30%) were Wilms' tumor, and 15 (20%) were other tumor types. The mean age of the patients with renal cell carcinoma was 16.7 years old, which was significantly older than the Wilms' tumor patients (13.9 years; $P < .01$). The 5-year cumulative survival rate of patients with renal cell carcinoma was 54%, which was worse than that of Wilms' tumor patients (77%).

Conclusion: Primary renal malignancies are uncommon in the second decade of life. The most common tumor type in this age-group is renal cell carcinoma followed by Wilms' tumor. Patients with renal cell carcinoma tend to be older and have a lower survival than patients with other kidney tumors.

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Primary renal malignancies occur rarely in the second decade of life. Wilms' tumor represents the most common renal tumor of childhood, and renal cell carcinoma is the most common renal tumor in adults, but neither is common in adolescents [1]. Other less common renal tumors, such as sarcoma subtypes, may also present in this age-group. Previous reports have demonstrated that less than 5% of renal tumors occur in teenaged patients [1]. Despite the rarity of renal malignancy in this age-group, an understanding of the predominant tumors may help guide the appropriate workup and has implications for management and prognosis. To better characterize renal tumors in patients aged 11 to 20 years old, a retrospective analysis of a large, population-based database was performed.

1. Methods

Material from the California Cancer Registry (CCR), a total population-based database, was reviewed from the years 1988 to 2004. The California Cancer Registry is certified by the North American Association of Central Cancer Registries and is part of the National Cancer Institute Surveillance, Epidemiology, and End Results Program. The database includes information about cancer type (histologic result), patient demographics, disease stage at diagnosis, and survival.

The California Cancer Registry does not contain complete information regarding clinical presentation, treatment modality, or comorbid conditions, and thus, those data were not included in this study. Median follow-up was 10 years. Nominal data were compared using a χ^2 analysis, and survival data were compared using a z test. A P value of less than .05 was considered statistically significant.

2. Results

2.1. Histologic examination

Seventy-seven primary renal tumors were identified in patients aged 11 to 20 years old. Of those, 39 (51%) were renal cell carcinoma (RCC) of different histologic subtypes (papillary, adenocarcinoma, clear cell, and medullary). Twenty-three of the tumors (30%) were Wilms' tumor. Of the remaining tumors, 9 (12%) were other histologic types (including clear cell sarcoma, alveolar rhabdomyosarcoma, angiosarcoma, hemangiopericytoma, and mesenchymal chondrosarcoma), and 6 (8%) did not report histologic condition.

2.2. Demographics

Forty-three (56%) of the patients were female, and 34 (44%) were male. Of the patients with RCC, 53% were female (n = 21). Of the Wilms' tumor patients, 66% (n = 15) were female.

The highest percentage of tumors presented in white patients (n = 37; 48%), with fewer identified in African American (n = 17; 22%), Hispanic (n = 14; 18%), and Asian/Pacific Islander (n = 6; 8%) patients. Although most of both Wilms' and RCC were found in white children, there was a higher percentage of RCC in African American children (n = 11; 28%) compared to Wilms' tumor (n = 2; 9%). This difference was not statistically significant (P = .08) (Table 1).

2.3. Age

The mean age of the entire cohort was 15.8 years old. The mean age of the patients with renal cell carcinoma was 16.7 years old, which was significantly older than the Wilms' tumor patients (13.9 years; P < .01). Patients diagnosed with other tumor types had a mean age of 15.6 years old (Fig. 1).

2.4. Survival

The 5-year cumulative survival rate of patients with renal cell carcinoma was 54% and was unchanged at 10 years. Wilms' tumor patients had a better prognosis with a 5-year and 10-year cumulative survival rate of 77%. This difference in survival between the tumor types was not statistically significant (P = .06).

3. Discussion

There is an abundance of literature about renal tumors in young children and in adults. Because of their rarity in the teenagers, relatively little has been reported about renal tumors in patients aged 11 to 20 years old. Most reports of renal tumors in adolescents are in the form of case reports or small series [1-3]. Although there are other rare tumors described in this patient population, most tumors are either

Table 1 Breakdown of ethnicity of RCC patients, Wilms' tumor patients, and of the entire population of California (aged 11-20 years old)

	White	African American	Hispanic	Asian/Pacific Islander	Other
RCC	49%	28%	18%	3%	3%
Wilms' tumor	52%	9%	22%	9%	9%
California population	42%	8%	39%	11%	1%