Clinical Highlights from the National Cancer Data Base, 2000

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Abstract
The National Cancer Data Base (NCDB) is the empirical data collection and analysis arm of the American College of Surgeons Commission on Cancer, and is supported in part by the American Cancer Society. The NCDB collects oncology patient demographic information, diagnostic and treatment information, and outcomes data from a broad spectrum of hospital-based cancer registries throughout the US, ranging from large research and teaching facilities to small community hospitals. Through this unique network, data are aggregated and reported back to participating hospitals to allow individual facilities to evaluate local patient care practices and outcomes.

This article highlights the principal findings of articles published in 1999 and early 2000 that used NCDB data as the empirical basis of their analyses. Included among these are articles on breast cancer, gastric carcinoma, head and neck cancers, leukemia, liver carcinoma, lung cancer, parathyroid tumors, prostate carcinoma, small bowel adenocarcinoma, testicular malignancies, and vulvar melanoma. These articles are based on cases diagnosed between 1985 and 1996. The NCDB has accrued more than 6.4 million cancer cases for this time period. Sufficient numbers of rare cancers are reported to the NCDB to permit some types of clinical evaluation not possible using other data sources. (CA Cancer J Clin 2000;50:171-183).

Introduction
The National Cancer Data Base (NCDB), which is a joint project of the Commission on Cancer of the American College of Surgeons and the American Cancer Society, has as its mission the management of a community cancer treatment and outcomes data base for health care organizations. Serving as the clinical data collection arm of the Commission on Cancer, the NCDB is in a position to access cancer registry data from hospitals participating in the Commission’s Approvals program. The NCDB was conceived and implemented by clinical experts interested in patterns of care, and the program should be viewed as a clinical cancer control program rather than an epidemiological research program. In this respect, the NCDB is unique among other cancer data bases operating in the US, including the Na-
tional Cancer Institute’s Surveillance, Epidemiology and End Results registry (SEER) and the Centers for Disease Control and Prevention’s network of state central registries in the National Program of Cancer Registries.

Sources of the Data

The methodology and data collection mechanisms of the NCDB have been previously described. Case information for this report was derived from eight NCDB Calls for Data on cancers of all types diagnosed between the years 1985 and 1996. More than 1,950 hospital cancer registries submitted data in response to one or more of these data requests. Beginning in 1996, hospital cancer programs that were awarded approval status by the Commission on Cancer were required to submit data to the NCDB. Data were received from a total of 1,638 hospitals for the diagnosis year 1996. The cumulative number of cases, through 1996, on which this report is based is 6,440,832.

Scope of NCDB Data

For the diagnosis year 1996, the most recent year reported to the NCDB, 1,638 hospital cancer registries from 50 states, Puerto Rico, and the District of Columbia reported 872,722 cases, accounting for approximately 66% of newly diagnosed cancer cases in the US.

Of the 1,638 hospitals reporting cases to the NCDB, 17.8% reported more than 1,000 cases; 34.5% reported between 500 and 1,000 cases; 21.4% reported between 300 and 499 cases; and 26.3% reported fewer than 300 cases. The mean number of cases reported by a hospital was 646 cases. NCI-recognized cancer centers (23) made up 1.4% of facilities reporting data to the NCDB. These facilities, on average, reported more than 1,900 cases apiece. Teaching hospitals (306) constituted 18.7% of reporting facilities, averaging slightly more than 1,000 cases per facility. Large community hospitals (460, 28.1%) and small/medium community hospitals (661, 40.4%) made up the bulk of reporting facilities. On average, these hospitals contributed 800 and 430 cases each, respectively, to the NCDB.

Geographic distribution of cases submitted to the NCDB is best evaluated at a regional level. ACS estimates of the number of newly diagnosed cases in the US in 1996 can be used as a measure of the representativeness of regional reporting. Slightly more than 201,000 cases were reported to the NCDB from Northeastern states,构成ing 68.8% of the estimated newly diagnosed cases in that area. For other parts of the country, the number of cases and the proportion of estimated new cases is as follows: Southeast, 163,294 (62.1%); Midwest, 223,810 (67.2%); South, 131,663 (57.9%); Mountain, 32,812 (49%); and Pacific, 118,855 (67.9%).

There was a greater degree of variability in reporting patterns at the state level. On average, hospital registries reported slightly more than 67% of the estimated number of newly diagnosed cases for each state. Massachusetts, Minnesota, Missouri, Nebraska, and Washington each reported more than 80% of new cases diagnosed in 1996, whereas Arkansas, Arizona, Kansas, Michigan, and Mississippi reported fewer than half of new cases to the NCDB. These results are consistent with earlier evaluations of the NCDB data.

Between 1985 and 1996, the NCDB collected almost 6.5 million cases from hospital cancer registries. Slightly more than 1% of cases reported to the NCDB over this time period are pediatric cases, including 47,999 cases of children under the age of 14, and 26,350 cases of adolescent cancer (ages 15 through 19). Additionally, the data base is a valuable resource for the study of both commonly and infrequently diagnosed cancers. Among the more commonly diagnosed cancers, the NCDB has collected 1,014,364 breast cases; 949,882 lung cas-
es; 792,434 prostate cases; 513,073 colon cases; 249,532 bladder cases; and 216,741 rectal cases. Among cancers that are more rarely diagnosed, the data base contains 16,319 cases of cancer of the salivary glands; 17,195 small intestine cases; 5,777 cases of intrahepatic bile duct cancer; 11,894 cases of cancer of the pleura; and 10,756 cases of cancers of the eye and orbit. Published findings using NCDB data examining the management and outcomes of a number of infrequently encountered cancers are reviewed in this article.

The following highlights describe the principal findings reported by the NCDB using data from the years 1985 through 1996 and published in 1999 and early 2000.

### Chronic Lymphocytic Leukemia

Chronic lymphocytic leukemia (CLL) is the most commonly occurring form of leukemia in Western countries. It is a disease of the elderly, and the risk of CLL increases progressively with age, without reaching a plateau. The mean age of patients with CLL has increased in direct proportion to the aging of the US population over the past century.

- Between 1985 and 1995, 22.6% (24,537) of the 108,396 cases of leukemia reported to the NCDB were CLL. The mean age of CLL patients in this cohort was 69.6 years, older than that in earlier reported series (Minot, 1924 and Reinhard, 1959). The relative frequency of newly diagnosed CLL, normalized to that of patients younger than 40, was 92 times higher for patients aged 50 to 59 and 352 times higher for patients 70 to 79 years of age. The ratio of men to women diagnosed with CLL was approximately 3:2, and the relative risk of diagnosis for men, compared with women, increased as individuals aged.

- Changing patterns of treatment were noted between patients diagnosed in the period between 1985 and 1990 and those diagnosed from 1991 to 1995. The proportion of patients receiving no therapy increased from 58.1% to 62.7% while the administration of chemotherapeutic agents decreased from 29.8% to 25.5%. Patient age was related to patterns of treatment, with older patients more likely to receive no therapy, increasing steadily from 44% among patients younger than 40 to 65.9% among those 80 and older. The use of chemotherapy was age-related, with 41.1% of patients younger than 40 and 22.9% of those 80 and older receiving chemotherapy.

- In the past, CLL was considered a disease of the elderly, who, in many cases, would die as a result of conditions other than CLL. Relative survival rates were calculated for patients in different age categories to gauge the extent to which individuals were dying of their disease as opposed to potentially fatal comorbid conditions associated with an aging population. The overall relative survival rate for 11,610 patients was 66.6%. Relative survival rates stratified by patient age were 59.9% for those younger than 40; 69.9% for 40- to 59-year olds; 61.6% for those aged 60 to 79; and 31.8% among patients 80 or older. These results suggest that patients are not outliving their leukemia and dying of other comorbid conditions.
Data from the NCDB were used to confirm the increasing national trend toward utilization of breast conservation surgery (BCS). Moreover, these data demonstrate that a significant proportion of women diagnosed with American Joint Committee on Cancer (AJCC) stage I and II disease did not receive axillary node dissection (AND) and may be inadequately treated by current standards.8

- A total of 547,847 women diagnosed with AJCC stage I or II breast cancer between 1985 and 1995 in the US were reviewed. Surgery alone was used with less frequency in 1994/1995 (35%) than in 1985/1989 (49.3%) in the treatment of these patients. There was an increasing trend in the use of BCS, without AND (6.4% to 10.6%) or with AND (17.6% to 36.6%) and a corresponding decrease in the use of modified radical mastectomy (65.8% to 47.1%) to surgically treat early-stage breast cancer over the 11 years reviewed. These figures suggest that the proportion of patients with early-stage disease not treated with BCS declined from 76% in 1985/1989 to 53% in 1994/1995.

- Women with AJCC stage I cancer (8,4887) were more likely than stage II patients (66,130) to undergo BCS (56.5% versus 35.2%). Almost 75% of AJCC stage I patients who received BCS had an AND, while 84.4% of stage II cases receiving BCS had AND. As histologic grade increased, the proportion of patients treated surgically with modified radical mastectomy or BCS with AND increased.

- Changes in the patterns of surgical treatment were complemented by a slight increase in the frequency of surgery used in conjunction with either radiation (14% to 16.3%) or chemotherapy (22.3% to 24.1%), and a marked increase (8.6% to 22%) in the proportion of women treated by a combined modality of surgery, radiation, and chemotherapy.

- Women younger than 51 years of age were more likely to receive AND in conjunction with BCS than women older than 50. However, among older women, decisions regarding adjuvant therapy are often made independent of axillary nodal status, and may explain the difference in selection of surgical treatment.

- There was little variation in the proportion of women from different income levels who received BCS without AND. However, less affluent women (<$20,000) were less likely to have received BCS with AND (28.9%) and more likely to receive modified radical mastectomy (55.4%) than were more affluent women (>$47,000), 44.4% of whom were treated with BCS plus AND and 38.6% of whom underwent modified radical mastectomy.

- Ten-year survival rates by AJCC stage of disease and treatment modality have been previously published.9 These show that stage I patients treated with BCS alone or in combination with radiation and/or chemotherapy have poorer outcomes than do similarly staged women who receive BCS plus AND alone or with adjuvant therapy.
Breast Cancer

Management of Patients from Low-Income Zip Codes

The changing clinical management of breast cancer has been accompanied by an increased understanding of disease management and participation in management decisions by patients. This study was conducted to better understand whether breast cancer management differs for women living in low-income zip codes in the US.10 Two years of data (1995 and 1996) were reviewed and included 191,714 breast cancer cases, approximately 57% of all cases diagnosed during those two years. Only non-Hispanic white women were assessed in an effort to minimize the potentially confounding effects of the relationship between income and ethnicity.

- Individual income was inferred from the average annual family income of the zip code of the patient’s residence at the time of diagnosis. For this review, patients were classified as either low family income (<$20,000) and other family income ($20,000 or higher). Following expected census patterns, cases from low-income zip codes were relatively more frequently reported in the South and less frequently in the Northeast and Pacific regions.

- Patients from low-income zip codes were slightly older than other patients (63.1 years and 61.5 years, respectively) and were less likely to be diagnosed with AJCC stage 0 or I breast cancer than were other women (51.2% versus 55.9%). Regardless of AJCC stage of disease, patients from low-income zip codes were less frequently treated with partial mastectomy, with or without AND, (14.9% versus 18.3%), and less likely to receive AND when a partial mastectomy was given (23.3% versus 30.5%). In contrast, women from low-income zip codes were more frequently surgically treated with modified radical mastectomy than were other women (49.8% versus 40.5%).

- Differences were observed between the two income groups in the surgical management of in situ and early-stage disease. Among stage 0 patients, women from low-income zip codes were less frequently surgically treated with partial mastectomy, with or without AND, (53.1%) than were other women (60.5%). A similar difference was observed in the treatment of low-grade AJCC stage I cancers: The proportion of patients from low-income zip codes receiving partial mastectomy was 49.1% while among other patients, the proportion was 60.2%. Overall, half of patients diagnosed with low-grade AJCC stage II tumors were treated with modified radical mastectomy; however, women from low-income zip codes were more frequently treated surgically (63.1%) compared with other women (50%).

- The authors suggest that some of the differences between income groups could be related to the somewhat more advanced stage of disease among lower income women at diagnosis. In addition, slower-than-optimal therapeutic improvements over time, particularly in light of the dramatic shift in the early detection and surgical treatment of breast cancer in recent years, may result from differing access of low-income women to early detection programs and conservative surgical therapies. Challenges of access may result, among other factors, from restricted patient choice or physician decision.
This review of NCDB data was undertaken to examine three hypotheses that have been proposed to explain the superior survival rates reported for Japanese patients with gastric carcinomas in the medical literature. These hypotheses are categorized as 1) *different biology*, 2) *stage migration*, and 3) *different treatment*. Cases selected for review included only gastric carcinomas and were limited to patients whose treatment included gastrectomy. Stage-specific analysis was limited to pathologically staged cases. Cases where node counts were 0 or unknown were considered unstageable (according to the AJCC 5th Edition staging manual).

- **Japanese-Americans** (n=721) diagnosed with gastric carcinoma presented at a slightly older age, with earlier stage disease and considerably less frequently with tumors of the gastric cardia than did the overall patient group (n=33,085). The subsite distribution of tumors among Japanese-American patients differed from the overall group at every stage of diagnosis; proximal tumors were less frequently diagnosed and distal tumors more frequently diagnosed among the Japanese-American cohort. Accordingly, distal gastrectomy was performed more frequently in Japanese-American patients than in the overall group.

- **Five-year survival rates** for all patients diagnosed with AJCC stage IA disease was 78% and declined with increasing stage to 7% for stage IV cases. The 10-year rates were comparatively lower, with stage IA patients having a 65% survival rate and stage IV cases, 5%. Women appeared to have a 6% survival advantage over men at five and 10 years following diagnosis. Survival for patients with proximal tumors was substantially worse than for those diagnosed with distal tumors, a difference attributable in large part to poor outcomes in patients with tumors of the cardia.

- Stage-for-stage, survival rates were higher for patients of Japanese-American heritage. The higher proportion of female patients and the lower proportion of proximal tumors contributed to this survival advantage observed among Japanese-Americans when compared with non-Hispanic, Hispanic, and African-American patients. The overall five and 10-year survival rates for each of these four groups were 42%, 26%, 30%, 28%, and 30%, 19%, 22%, 20%, respectively.

- Additional survival calculations stratifying patients by the number of dissected lymph nodes indicated that survival rates increased when 15 or more nodes were analyzed, but did not change appreciably when the number of nodes dissected exceeded 24. The stage-migration effect of inadequate nodal analysis on observed survival rates was demonstrated for cases in which fewer than 15 nodes were examined.

- The authors conclude that the AJCC staging system does not adequately take into account the adverse effect of proximal tumors on prognosis, and that surgical undertreatment appears to be a problem in the management of this disease. These observations leave the “different biology” hypothesis unaddressed while suggesting that the “stage migration” and “different treatment” hypotheses deserve further investigation.
Salivary gland cancers comprise about 0.6% of all cancers diagnosed in the US and acinic cell carcinomas constitute approximately 8% of salivary gland cancers. This histologic type of disease is considered indolent in behavior and at least 10-year follow-up data are believed necessary to gauge the impact of treatment on survival. This review\(^{12}\) of acinic cell carcinomas reported by the NCDB constitutes the largest series to date, with 1,353 cases diagnosed between 1985 and 1995.

- Women were more frequently diagnosed (58.8%) than were men (41.2%). The median age at diagnosis was 52, younger than for most other salivary gland cancers. Slightly more than 16% of patients were under the age of 30 and women comprised a significantly larger proportion of cases in this younger age group (64.4%) than among those 30 years of age or older.
- The parotid gland was the predominant site of origin (86.3%) for reported acinic cell carcinomas. Median tumor size was 2 centimeters. Slightly more than two thirds of cases were AJCC stage I; stage II, 14.4%; stage III, 11%; stage IV, 7.1%. Regional and distant metastasis, high grade (3 and 4), and large tumor size were all more common among patients older than 30.
- More than half of these patients, 64%, were treated with surgery alone, whereas 30.1% received surgery and radiotherapy. Cervical lymphadenectomy was reported for 12.1% of cases. Nodes were confirmed as positive in 36.6% of 135 patients who underwent neck dissection. Treatment with surgery and radiation was associated with age over 30 and with tumors of advanced stage or grade.
- Follow-up information was available for 99% of cases reported between 1985 and 1990. Overall five-year disease-specific survival was 91.4%, and at 10 years, it was 88.6%. Significant associations were noted between poor survival and high-grade disease, regional or distant metastasis at presentation, submandibular tumors, and age older than 30.
- Contrary to the widely accepted notion that acinic cell carcinomas can be equated with favorable prognostic groups, such as low-grade mucoepidermoid carcinoma or low-grade adenocarcinomas, this review suggests that there is a subset of acinic cell carcinomas with poor prognoses. Aggressive tumors were treated three times as frequently with surgery and radiation compared with treatment patterns for less aggressive disease.
Liver Carcinoma

There were no substantial differences observed in the gender, age, or ethnic characteristics of patients diagnosed with primary hepatocellular carcinoma over the period from 1985 to 1996.\textsuperscript{13} Three prevailing treatment patterns were discerned. First, an increasing proportion of patients received no treatment at all (42.9% to 51.3%) between 1985 and 1996. Second, the proportion of patients treated with chemotherapy alone decreased over time from 27.3% to 17.7%. Third, surgery alone was utilized with increasing frequency for patients with AJCC stage I, II, or III disease. The increase in the proportion of stage III cases treated with surgery alone was accompanied by a corresponding decline in the proportion of patients receiving chemotherapy. These changing treatment patterns suggest that newer surgical techniques such as cryosurgery and radiofrequency ablation are being more widely adopted.

Survival of patients with hepatocellular carcinoma is poor, with 10% of AJCC stage I cases surviving to five years. A marked difference in the five-year survival rate of AJCC stage II and III patients treated with surgery alone (37% and 35% respectively) was noted compared with those managed with chemotherapy alone (6% and 1% respectively). Multivariate analysis affirmed this observation.

Parathyroid Carcinoma

This review of 286 cases of parathyroid carcinoma reported to the NCDB over 11 years (1985 to 1995) found few differences in the frequency of diagnosis by gender and no disproportionate clustering by ethnicity, income level, or geographic region.\textsuperscript{14} The median age of patients was 55.1 years.

- Measurable tumors were reported in 60.8% of cases, with a median tumor size of 3.3 centimeters. Information on lymph node involvement was available for only 36.7% of reported cases, with 15% of these being positive for tumor cells in the lymph nodes.
- Surgery alone (89.2%) was the dominant mode of therapy, with 60.2% undergoing a partial removal (one to three glands) of the primary site and 12.9% undergoing a radical resection [removal of the primary organ, adjacent organ(s)—usually the thyroid gland—and lymph nodes].
- The relative survival rate five years after diagnosis was 85.5%. No relationship was observed between either tumor size or nodal status and survival. The nature of the surgical treatment of this disease, which may involve piecemeal or incomplete tumor removal, confounds the opportunity to record a pathologic size of tumor and impacts on the prognostic strength of these data.
A review of 713,043 cases (123,554 small cell carcinomas, 568,295 non-small cell carcinomas, 863 sarcomas, and 20,331 other or unspecified types) diagnosed between 1985 and 1995 demonstrated a continuing decrease in the ratio of males to females diagnosed with lung cancer; a decrease in the proportion of non-surgically treated patients coinciding with an increase in the proportion of cases that received no cancer-directed therapy; an increased use of chemotherapy among non-surgically treated patients; and a continued poor outlook for patients diagnosed with this disease.\textsuperscript{15}

- The overall ratio of men to women fell from 1.92 during the period from 1985 to 1987 to 1.5 in 1995. This ratio dropped regardless of age group and was most pronounced among patients 70 years or older, decreasing from 2.07 to 1.3. There was an increase in the proportion of patients 70 years or older between 1985/1987 and 1995, expanding from 35% of cases to 43% of cases reported to the NCDB.

- The proportion of patients treated by non-surgical means decreased from 59% to 54% between 1985/1987 and 1995. This was accompanied by an increase in the proportion of cases that did not receive cancer-directed therapy, rising from 14% to 19% of cases over 11 years. The proportion of untreated patients increased over time for all stages of disease in each of the four histologic groups reviewed: Small cell carcinoma, squamous cell carcinoma, adenocarcinoma, and large cell carcinoma. Approximately 20% of AJCC stage IV patients did not receive cancer-directed therapy in 1995.

- Chemotherapy, particularly multiple-agent chemotherapy, was administered with increasing frequency in non-surgical patients. In 1985/1987, 23% of patients with lung cancer were treated by chemotherapy alone, rising to 30% in 1995. Much of this increase can be accounted for by the greater utilization of multiple-agent regimes, which is consistent with the minimal but real benefit reported with chemotherapy in lung carcinoma.

- Chemotherapy combined with radiation therapy was administered with increasing frequency to manage all stages of small cell carcinomas. Radiation alone was used with decreasing frequency in the treatment of squamous cell and large cell carcinomas. Radiation therapy with or without surgery was most frequently used in the management of AJCC stage III patients for all carcinomas.

- AJCC stage of disease at time of diagnosis was predictive of survival outcome, although survival rates varied by histologic category. Patients with small cell carcinoma had a five-year survival rate of 5% and a 10-year survival rate of 2%. In contrast, the 10-year survival rates for patients with lung sarcomas and adenocarcinomas were 18% and 10%, respectively. Patients who received cancer-directed therapy appeared to have a small survival advantage over patients who received no treatment. The five-year survival rate, not adjusted for AJCC stage, was 14% among treated sarcoma patients and 8% among treated adenocarcinoma patients. The 10-year survival rate for patients who did not receive any cancer-directed therapy was 5% (sarcoma) and 2% (adenocarcinoma).
A review of 435,264 men diagnosed with prostate cancer between 1992 and 1996 and reported by 1,758 hospitals indicated that the increasing use of brachytherapy for the treatment of AJCC stage I and II cases is a nationally significant trend most evident among stage I patients. The total number of stage I and II patients reportedly treated with brachytherapy was 7,226. These patients constituted 43.9% (stage I) and 52.3% (stage II) of all patients treated with brachytherapy.16

• Over the five years reviewed, there was evidence of a progressive decline in the proportion of men diagnosed with advanced prostate cancer, AJCC stages III and IV, falling from 25.5% in 1992 to 20% in 1996. Concurrent with this pattern of diagnosis at earlier stages was a marked increase in the proportion of patients diagnosed at younger ages (younger than 60), climbing from almost 9% to 17% of reported cases over five years. The mean age of men reported as diagnosed in 1992 was 70.7 years, falling to 68.6 years in 1996.

• The proportion of prostate cases treated with brachytherapy increased from 1.4% in 1992 to 3% in 1996. Of those receiving brachytherapy, 44% (3,298) were diagnosed with AJCC stage I disease and 52.3% (3,928) were diagnosed with AJCC stage II disease. However, as a proportion of the total number of cases within each stage group, brachytherapy was used more frequently among AJCC stage I patients. In 1992, 2% of stage I patients and 1.5% of stage II patients received brachytherapy, whereas by 1996, the difference was more pronounced: 5.8% of stage I patients and 2.7% of stage II opted to undergo brachytherapy.

• The use of brachytherapy among patients with AJCC stage I disease was predominantly applied for patients with well- (20.3%) or moderately (69.5%) differentiated tumors. Brachytherapy was administered broadly in patients of all ages, though with slightly higher frequency among patients between the ages of 70 and 74 years of age.

• The proportion of hospitals reporting prostate cases treated by brachytherapy to the NCDB doubled over the period reviewed, increasing from 13.2% in 1992 to 25.2% in 1996.
Small Bowel Carcinoma

Adenocarcinoma of the small bowel accounts for 2% of diagnosed gastrointestinal tumors. This article reviewed 14,253 small bowel carcinomas, of which 4,995 were adenocarcinomas, reported by 1,206 hospitals between 1985 and 1995. Almost 1,900 cases had sufficient follow-up information to allow for survival analysis. Prior to this review, the largest series of small bowel adenocarcinoma (SBA) cases was reported by the SEER program and included 1,609 patients diagnosed between 1973 and 1991, and the largest series to include survival data consisted of 100 patients.

- The mean age of patients was 65.4 years; men were diagnosed as frequently as were women; and the proportional distribution of patients by ethnicity was similar to that seen in the SEER report.
- SBA were most frequently located in the duodenum (63.2%), followed by the jejunum (20.2%) and the ileum (14.8%). Among patients staged according to the AJCC schema, 2.7% were stage 0; 12%, stage I; 27%, stage II; 26%, stage III; and 32.3%, stage IV. Most (90%) of reported cases were staged according to the extent-of-disease staging scheme; local, 43.6%; regional, 26.7%; and distant, 29.7%.
- Treatment was primarily surgical, though this varied slightly by the anatomic position of the tumor. Approximately 90% of patients with tumors originating in the jejunum and ileum were treated surgically while a smaller percentage (52%) of patients with duodenal tumors received surgical therapy. This difference is largely explained by anatomic constraints that increase the complexity of managing duodenal tumors.
- The use of surgery as a treatment modality decreased with increasing degrees of tumor invasion. Increased patient age was also associated with decreased frequency of surgical intervention. Chemotherapy was administered to only 14% of patients with localized disease, but to more than a third of those diagnosed with regional or distant cancers.
- Patient outcome was stratified by a number of variables. The overall five-year disease-specific survival rate was 30.5%, with median survival of 19.7 months. Patients older than 75 years of age had a significantly worse survival rate than did younger patients. Patients with poorly differentiated tumors had worse prognoses than did those with well- or moderately differentiated tumors. Patients with duodenal tumors fared worse than those with tumors originating in the jejunum or ileum. Surgically treated patients had a five-year survival rate of 34.1% compared with 9.3% for those who did not receive surgical therapy. Survival decreased with increasing extent of disease: AJCC stage I, 65.1%; stage II, 48.1%; stage III, 35.4%; stage IV, 4.2%; local, 47.6%; regional, 31%; and distant, 5.2%.
Testicular Carcinoma

A review of 15,409 cases of testicular cancer diagnosed over three time periods (1985/1986, 1990/1991, and 1995/1996) indicated that the proportion of patients under 30 years of age declined over time from 42.3% in 1985/1986 to 30.3% in 1995/1996. In each of the three time periods, almost 90% of seminomas were diagnosed at an early stage, whereas nonseminomatous germ cell tumors (NSGCT) were diagnosed early 63% of the time.

• Orchiectomy is the principal treatment for early-stage seminoma, and the proportion of orchiectomies without lymph node dissection (LND) increased from 33.6% to 82.8% among surgically treated patients between 1985 and 1996. In 1985/1986, 43.3% of advanced stage seminoma patients were treated with surgery and radiation, while 25.7% received surgery and chemotherapy. This treatment pattern was reversed in 1995/1996 with 25% of patients receiving surgery plus radiation and 46% receiving surgery plus chemotherapy.

• Among men diagnosed with early-stage NSGCT during the 11 years reviewed, the proportion that underwent orchiectomy with retroperitoneal LND increased from 18.1% to 23.5%. Surgery plus chemotherapy remained the predominant treatment modality for patients with advanced stage NSGCT, increasing slightly from 75.3% to 79.1% in 1985/1986 and 1995/1996, respectively.

• Survival rate for stage I seminoma patients was 97.9%; for stage II, 91.3%; and for stage III, 74.8%. Among stage I NSGCT patients, survival was 96.5%; for stage II, 93.1%; and for stage III disease, 74.1%.

Vulvar Melanoma

Vulvar melanoma is a very rare form of cancer. The 569 patients reviewed in this article constituted 0.7% of the 86,241 melanoma cases submitted to the NCDB between 1985 and 1995, and represent the largest number of cases reported to date.

• The median age of patients at diagnosis was 66 years. Advanced AJCC stage and Clark’s level at diagnosis increased with patient age; Breslow’s thickness was not reported as part of this review. Data concerning nodal dissection was available for 487 (86%) of cases: 227 (47%) had no nodes dissected and 260 (53%) received nodal dissection. The occurrence of positive nodes increased with the extent of disease using Clark’s classification.

• Nearly all patients were treated surgically. The proportion of AJCC stage I patients who underwent surgical therapy was 97%; for stage II, 99% had surgery; stage III, 92%; and stage IV, 66%. The extent of the surgical procedure (excision, debulking, radical) appeared to be dictated by the stage of disease. Radiotherapy and chemotherapy were used infrequently, usually in the management of advanced-stage disease.

• Follow-up information was available for 223 patients diagnosed between 1985 and 1989. Patient outcomes declined with increasing stage of disease. Five-year relative survival rates were 77% for stage 0 patients, 70% for stage I, 50% for stage II, 48% for stage III; and 24% for stage IV. All patients initially diagnosed with nonmetastatic disease in whom recurrent disease subsequently developed, died within five years of initial diagnosis.
Summary

The increasing size, with respect to reported cases, and depth, with respect to follow-up information, of the NCDB reflects the continuing support of a broad range of hospital cancer registries. The twelve papers reviewed in this article clearly demonstrate the capacity of the NCDB to collect meaningful data on presentation, therapy, and outcome for both common and rare tumors. The NCDB will continue to provide information on changing patterns of cancer treatment over time, to reflect the impact of these changes on survival, and to stimulate further investigation into the clinical management of these and other forms of cancer.

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