Incidence and prevalence of basal cell carcinoma (BCC) and locally advanced BCC (LABCC) in a large commercially insured population in the United States: A retrospective cohort study

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Background: Accurate evaluation of basal cell carcinoma (BCC) in the United States was not possible before the 2011 release of BCC-specific *International Classification of Diseases, Ninth Revision, Clinical Modification* codes.

Objective: We sought to describe BCC (including locally advanced BCC [LABCC]) incidence/prevalence and the characteristics of patients in a commercially insured US population.

Methods: This retrospective cohort study used Truven Health MarketScan database insurance claims. Patients, aged 18 years or older with 2 or more BCC claims at least 30 days apart from October 1, 2011, to September 30, 2012, were continuously enrolled in medical and pharmacy benefits for 12 months before and after the index claim. A specific algorithm was used to classify patients with LABCC.

Results: A total of 56,987 patients with BCC were identified (39,035 incident cases; 17,952 prevalent cases). Age-adjusted BCC incidence and prevalence were 226.09 and 342.64 per 100,000 persons, respectively. These values project to 542,782 patients (incidence) and 822,593 patients (prevalence) in the 2012 US population. LABCC was uncommon (471 cases identified; projected US incidence and prevalence: 4399 and 7940 patients, respectively).

Limitations: Use of medical claims data and retrospective analysis are limitations.

Conclusion: In a study designed to distinguish patients with LABCC from the general BCC population based on BCC-specific *International Classification of Diseases, Ninth Revision, Clinical Modification* codes, 0.8% were found to have LABCC, the majority having pre-existing disease. (J Am Acad Dermatol 2016;75:957-66.)

Key words: basal cell carcinoma; epidemiology; incidence; locally advanced disease; metastatic disease; nonmelanoma skin cancer; prevalence; retrospective claims analysis.

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Basal cell carcinoma (BCC), a subset of nonmelanoma skin cancer (NMSC), is the most common cancer in the United States, with an estimated 2.7 million cases diagnosed annually.[1,2] Total costs for skin cancer increased substantially from 2002 to 2011—to a greater extent than cost increases for all other cancer sites—owing to increases in the number of persons treated, and to per-person treatment costs.[3] The overwhelming majority of patients with BCC can be cured using a variety of treatment modalities, including curettage, excision, Mohs micrographic surgery, radiation, and topical therapy; however, a small proportion have disease that is refractory, inoperable, or metastatic. The term "advanced BCC" refers to locally invasive BCC that is not amenable to surgical or radiation therapy interventions, or that has metastasized to regional lymph nodes or beyond.[4-6]

CAPSULE SUMMARY

- Accurate evaluation of basal cell carcinoma (BCC) epidemiology was not possible before release of BCC-specific *International Classification of Diseases, Ninth Revision, Clinical Modification* codes.
- In a commercially insured US population, 2012 BCC incidence and prevalence estimates projected to 542,782 and 822,593 patients, respectively; locally advanced BCC was uncommon (<1%).
- Accurate BCC epidemiology estimates will facilitate optimal resource allocation.

Historically, BCC has been excluded as a category from cancer registry databases because the number of patients with these generally localized tumors greatly exceeds the number of patients with other malignancies. Moreover, because administrative data could not distinguish among NMSC subtypes, previous studies have focused on NMSC as a whole.[1,7-9] The release of BCC-specific *International Classification of Diseases, Ninth Revision, Clinical Modification* (*ICD-9-CM*) codes in October 2011 has allowed for more accurate epidemiologic analysis of this malignancy.

In a previous study, an algorithm was developed to classify patients with commercial insurance and NMSC into 3 groups: patients with metastatic disease, patients with locally advanced disease, and all others.[9] Although demographic data and insurance coverage were described, information on patient comorbidities was not provided. The study focused on NMSC, as BCC-specific *ICD-9-CM* codes were unavailable. In contrast, the current study used BCC-specific *ICD-9-CM* codes to estimate the incidence and prevalence of BCC, locally advanced BCC (LABCC), and metastatic BCC (MBCC) in a commercially insured US population. Because specific *ICD-9-CM* codes are not available for LABCC and MBCC, additional criteria were used to classify these subgroups. The demographic and clinical characteristics of the overall BCC cohort and these 2 subgroups are also described.

METHODS

Study design

This was a retrospective cohort study using health insurance claims data from the Commercial Claims and Encounters database within the Truven Health MarketScan database. These data contain claims from approximately 100 employers, health plans, and government and public organizations, representing approximately 30 million covered lives. All US census regions are represented, with the most predominant being the South and North Central (Midwest) regions. Enrollees in the database include employees, dependents, and retirees with primary or Medicare supplemental coverage through privately insured fee-for-service, point-of-service, or capitated health plans. All study data were accessed using techniques compliant with the Health Insurance Portability and Accountability Act of 1996. No identifiable protected health information was extracted, so this study did not require informed consent or institutional review board approval.

Identification of patients with BCC

Patients aged 18 years or older with at least 2 claims and a diagnosis of BCC in any location during the identification period (October 1, 2011, to September 30, 2012), with the claims separated by at least 30 days, were identified. A diagnosis of BCC was based on any of the following *ICD-9-CM* codes: 173.01, 173.11, 173.21, 173.31, 173.41, 173.51, 173.61, 173.71, 173.81, or 173.91. The date of first diagnosis of BCC during the identification period was designated as the index date. Included patients were continuously enrolled in fee-for-service medical and pharmacy benefit plans during the 12-month periods before and after the index date. For continuous enrollment, patients could not have a gap in enrollment of more than 40 days. Patients were further characterized as having incident or prevalent BCC according to the absence or presence, respectively, of an NMSC claim in the 12-month period before the BCC index date (*ICD-9-CM* 173.x