Advanced Basal Cell Carcinoma in a Large Veteran Population

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BACKGROUND

Basal cell carcinoma (BCC) is the most common malignancy worldwide. A small proportion of BCC patients develop locally advanced BCC (laBCC) or metastatic BCC (mBCC), collectively termed as advanced BCC (aBCC).

- laBCC develops due to local invasion into subcutaneous structures, frequently involves the head and neck region, and is associated with significant morbidity.
- mBCC is rare, occurring in 0.0028%-0.55% of BCC cases¹.

OBJECTIVE

Our objective was to describe clinical, treatment, and survival outcomes of aBCC patients in a large US military veteran population.

DATA SOURCE

- The Department of Veterans Affairs (VA) is a governmental medical institution serving U.S. military veterans in all 50 States, the District of Columbia, Puerto Rico, and Guam.

- The Veterans Affairs Informatics and Computing Infrastructure (VINCI) includes electronic health records (EHR) on over 10 million patients from 1999-Present. It also contains advanced analytic systems.

- National Death Index (NDI) data from the Center for Disease Control (CDC) was used to obtain cause of death for deceased patients.

Presented at the 22nd Congress of the European Academy of Dermatology and Venereology; 2-6 October 2013; Istanbul, Turkey
Natural Language Processing (NLP) was used to identify patients with documented diagnosis of BCC, laBCC, and mBCC within a cohort of non-melanoma skin cancer patients (ICD-9 173.xx) treated in 1999-2011. (Figure 1)

- All NLP-identified cases were confirmed for mBCC and laBCC diagnosis through chart review.
- laBCC was defined as patients who were not a candidate for surgery/inoperable, not a candidate for radiation, or recurrent BCC with mention of “advanced” or “locally advanced” within 6 months of recurrence.
- mBCC was defined as patients with metastases to a distant organ or lymph nodes. Patients with other primary cancers 12 months before the 1st documentation of BCC were excluded.

The index date was defined as the 1st documented diagnosis of laBCC or mBCC.

Patient and clinical characteristics were assessed by summary measure, including means and standard deviations for continuous variables and absolute numbers and percentages for categorical variables.

The first three treating clinicians of different specialty type that documented a diagnosis of aBCC was obtained for each patient to explore referral patterns.

Primary cause of death was characterized and survival for aBCC patient cohorts were determined using Kaplan-Meier (KM) estimates.

METHODS

- Patients with ≥1 documented diagnosis code for NMSC (ICD-9 173.x) 1/1/1999 - 12/31/2011
  - n = 528,497
- Patients with NLP-confirmed BCC
  - n = 363,627 (69%)
- Patients with confirmed aBCC
  - n = 1,576 (0.4%)
- Patients with confirmed mBCC
  - n = 475 (0.1%)
- Patients with confirmed laBCC
  - n = 1,171 (0.3%)

Exclude pts with any other primary cancer in the 1-yr baseline
  - n = 246,848

Figure 1: Attrition diagram of patients with aBCC in the VA included in this study
RESULTS

A total of 1,576 aBCC patients were identified (laBCC: n=1,171, mBCC: n=475) (Figure 1) with median follow-up of 27 months. (Table 1)

Median age was 78 years in laBCC and 72 years in mBCC, 98% male, and 73% were Caucasian. (Table 1)

Table 1: Description of patients with laBCC, mBCC and aBCC in the VA

<table>
<thead>
<tr>
<th></th>
<th>aBCC N = 1,576</th>
<th>laBCC N = 1,171</th>
<th>mBCC N = 475</th>
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<tbody>
<tr>
<td><strong>Continuous Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td></td>
<td>75.0 (11.3)</td>
<td>76.5 (11.0)</td>
<td>70.6 (11.1)</td>
</tr>
<tr>
<td>Follow-up Time (months)</td>
<td>37.7 (34.9)</td>
<td>37.7 (34.3)</td>
<td>35.4 (36.0)</td>
</tr>
<tr>
<td><strong>Categorical Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td></td>
<td>1,544 (98.0)</td>
<td>1,171 (98.1)</td>
<td>465 (97.9)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>1,142 (72.5)</td>
<td>832 (71.1)</td>
<td>363 (76.4)</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>10 (0.6)</td>
<td>8 (0.7)</td>
<td>3 (0.6)</td>
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<tr>
<td>Hispanic</td>
<td>69 (4.4)</td>
<td>61 (5.2)</td>
<td>12 (2.5)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Midwest</td>
<td>239 (15.2)</td>
<td>185 (15.8)</td>
<td>65 (13.7)</td>
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<tr>
<td>Northeast</td>
<td>235 (14.9)</td>
<td>160 (13.7)</td>
<td>85 (17.9)</td>
</tr>
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<td>South</td>
<td>636 (40.4)</td>
<td>475 (40.6)</td>
<td>188 (39.6)</td>
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<tr>
<td>West</td>
<td>385 (24.4)</td>
<td>279 (23.8)</td>
<td>125 (26.3)</td>
</tr>
<tr>
<td>Basal Cell Carcinoma Nevus Syndrome</td>
<td>4 (0.3)</td>
<td>3 (0.3)</td>
<td>1 (0.2)</td>
</tr>
</tbody>
</table>

Most prevalent comorbidities in aBCC patients in the 180 days after and including the index date were: (Figure 2)
- Diabetes (19%), chronic pulmonary disease (19%), congestive heart failure (11%), and cerebrovascular disease (10%)
- Mean Charlson Comorbidity Index (CCI) scores were: aBCC = 2.10; laBCC = 2.09; mBCC = 2.00

*Diagnoses from 180 days after and including the index date*
First aBCC diagnoses were documented by: (Figure 3)
- General practice physician (28% patients), dermatologists (20%),
ear, nose, throat specialists (8%), general surgeons (8%),
radiation oncologists (6%), and medical oncologists (4%).
- aBCC patients were treated by clinicians from a mean of 3.5
different specialties from index date to end of follow-up.
- The most common referral patterns were: (Figure 4)
  - general practice → other specialty → general practice
  - dermatology → general practice or other specialty → dermatology

aBCC patients were treated with surgery (47%),
chemotherapy (28%), and radiation therapy (13%).
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RESULTS (cont)

- At time of data cut-off, 59% of patients (n=924) were deceased.

- Among deceased patients, KM estimates of median survival were 37.9 mo aBCC, 37.0 mo laBCC and 35.9 mo mBCC.
  - 25% did not have NDI data available
  - Most common underlying causes of death were neoplasms (31%) and diseases of the circulatory system (19%)

Figure 5: Kaplan-Meier Survival Curves
Conclusion

We sought to characterize aBCC patients treated in a large population database representing military veterans. To date, this study represents the largest number of aBCC patients identified within a single database. Additional analyses are underway to understand disease characteristics and clinical outcomes for aBCC subgroups.

ACKNOWLEDGEMENT

The authors thank Rebekah Paredes, Andrew Wilson, Beniel K. Malohi, and Tom Ginter.

DISCLOSURE

SL DuVall has received research funding from Anolinx LLC, Genentech Inc, F. Hoffmann-La Roache Ltd, Amgen Inc, Shire PLC, and Mylan Pharm LP. AWC Kamauu is an owner of Anolinx LCC, which has received research funding from Genentech, Inc, F. Hoffman-La Roche Ltd, Mylan Specialty and Shire PLC. This work was performed using resources and facilities at the VA Salt Lake City Health Care System, with funding support from the VINCI, VA HSR HIR 08-204. The views expressed are those of the authors and not necessarily those of the VA or affiliated institutions.