ORIGINAL RESEARCH

Applicability of the USPSTF Lung Cancer Screening Guidelines in a Predominantly Black Veteran Population

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Background: Black individuals and veterans are at higher risk for developing lung cancer compared with that of the general population. Evidence suggests the screening criteria have been too conservative for this population.

Methods: This study is a retrospective chart review examining the applicability of the 2013 United States Preventive Services Task Force lung cancer screening guidelines in a US Department of Veteran Affairs institution that served a a predominantly black population. Patients diagnosed with stage 1 or 2 lung cancer from 2005 through 2017 were in-

cluded and grouped by whether or not they met United States Preventive Services Task Force screening criteria.

Results: There was a significantly higher proportion of Black patients in the study group that did not meet screening criteria (68% vs 54%, P = .04), highlighting the concern that this population was being underscreened with the 2013 guidelines.

Conclusions: An individualized, risk-based screening model could be more effective at diagnosing early-stage lung cancer and requires more investigation.

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Lung cancer is the leading cause of cancer death in the United States.[1] The 2011 National Lung Screening Trial (NLST) demonstrated that low-dose computed tomography (LDCT) screening provided a 20% relative reduction in lung cancer–specific mortality.[2] Based on these findings, the United States Preventive Services Task Force (USPSTF) published lung cancer screening guidelines in 2013 recommending an annual LDCT of the thorax in patients aged 55 to 80 years with a 30 pack-year smoking history and who currently smoke or quit within the past 15 years.

In 2021, the USPSTF updated its recommendations by reducing the qualifications for annual screening to a 20 pack-year smoking history.[3] The updated guidelines recognized the increased risk of lung cancer for Black individuals.[4,5] Evidence suggests the 2013 screening criteria was too conservative for this population.[6,7]

Similarly, US Department of Veteran Affairs (VA) patients are a population at higher risk for lung cancer due to a male predominance, presence of comorbidities, exposure to carcinogenic agents, and possibly a higher prevalence of tobacco smoking.[8] This study sought to examine the applicability of the USPSTF guidelines in a VA health care system with a predominantly Black population.

METHODS
A retrospective chart review of adult patients

who were diagnosed and treated with early-stage small cell or non–small cell lung cancer (stage I or II) was performed within the Southeast Louisiana Veterans Health Care System (SLVHCS) in New Orleans. The review used data from the VA Cancer Registry from January 1, 2005, through December 31, 2017. Patients were grouped by whether they met 2013 USPSTF screening criteria at time of diagnosis vs those that did not. Data collected included type and stage of lung cancer at time of diagnosis, context of diagnosis (incidental, screening, symptomatic), diagnostic method, smoking history, and presence of chronic obstructive pulmonary disease (COPD). Patients without a clear smoking history documented in the health record were excluded.

Statistical analyses were performed with GraphPad Prism 8.0. Student t test and Fischer exact test were performed for most of the statistical analyses, with differences between groups noted to be statistically significant at a P < .05.

RESULTS
A total of 182 patient charts were reviewed and 13 patients were excluded for missing information related to the USPSTF screening criteria. Of the 169 patients included, 122 (72%) met USPSTF screening criteria while 47 (28%) patients did not. The reasons for not meeting screening criteria were 14 patients were too young at and 9 patients

TABLE Baseline Characteristics

	Total (n = 169)	Met Criteria (n = 122)	Did Not Meet Criteria (n = 47)	P value
Age, mean	66.2	66.6	66.0	.70
Sex, No. (%)				.21
Male	163 (96)	119 (98)	44 (94)	
Female	6 (4)	3 (2)	3 (4)	
Race, No. (%)				.04
White	70 (41)	56 (46)	14 (30)	
Black	98 (58)	66 (54)	32 (68)	
Cancer type, No. (%)				.52
Small cell	9 (5)	7 (6)	2 (4)	
Non–small cell	160 (95)	115 (94)	45 (96)	
Stage at diagnosis, No. (%)				.55
I	125 (74)	90 (74)	35 (75)	
II	54 (26)	32 (26)	12 (25)	
Chronic obstructive pulmonary disease, No. (%)				< .001
Yes	111 (64)	90 (74)	21 (45)	
No	58 (34)	32 (26)	26 (55)	
Personal history of cancer, No. (%)				.14
Yes	44 (26)	35 (29)	9 (19)	
No	125 (74)	87 (71)	38 (81)	
Reason for diagnosis, No. (%)				
Symptommatic/diagnostic	60 (36)	16 (34)	44 (36)	
Incidental	64 (38)	17 (36)	47 (38)	
Screening	28 (17)	7 (15)	21 (17)	
Surveillence	11 (07)	3 (06)	8 (07)	
Other	6 (04)	4 (08)	2 (02)	

were too old at time of diagnosis, 7 had a < 20 pack-year smoking history, 7 patients had quit > 15 years previously, and 12 patients met multiple exclusion criteria. The study population was 96% male and there was an overall predominance of Black patients (58%) within the sample (Table).

There was a significantly higher proportion of Black patients in the group that did not meet screening criteria compared with the group that met screening criteria (68% vs 54%, *P* = .04). Cancer type and stage at diagnosis were similar in both patient populations. There was a statistically significant difference in COPD diagnosis between the groups, with a larger proportion of COPD patients in the met screening criteria group (74% vs 45%, *P* < .001). The mean smoking history was 61.4 pack-years in the met criteria group and 43.3 pack-years in the did not meet criteria group.

Five additional patients in the group that did not meet the 2013 USPSTF screening criteria would have met criteria if the 2021 USP-STF guidelines were applied. All 5 were Black patients. Using the 2021 guidelines, Black patients would have made up 56% of the patients who met screening criteria and 54% of the patients who did not meet screening criteria at time of diagnosis.

DISCUSSION

This study sought to determine the hypothetical effectiveness of national lung cancer screening guidelines in detecting early-stage lung cancer for a high-risk population. Patients diagnosed with early-stage lung cancer were selected as these patients have improved outcomes with treatment, and thus would theoretically benefit from early detection through screening. As expected, the study population had a majority of Black veterans (58%), with a higher proportion of Black patients in the did not meet screening criteria group compared with the met screening criteria group (68% vs 54%, *P* = .04). This difference highlights the concern that Black individuals were being underscreened with the

2013 USPSTF guidelines.[7] This is not all surprising as the NLST, from which the initial screening guidelines were based, included a majority White population with only 4.4% of their population being Black.[2] The USPSTF also cites the NELSON trial as evidence to support annual lung cancer screening, a trial that was performed in the Netherlands with a very different population compared with that of southeast Louisiana.[9]

Given concern that the old criteria were underscreening certain populations, the updated 2021 USPSTF guidelines sought to expand the screening population. In this study, the implementation of these new guidelines resulted in more Black patients meeting screening criteria.

Racial and ethnic disparities in health care in the US are no secret, as Black individuals consistently have increased disease and death rates, higher rates of unemployment, and decreased access to preventive medical care compared to White individuals.[10] Despite the updated USPSTF guidelines, additional modifications to the screening criteria could improve the ability to identify high-risk patients. A modified model using data from the Prostate, Lung, Colorectal, and Ovarian Screening Trial (PLCO) incorporating COPD history, race and ethnicity, and personal history of cancer increased the sensitivity for high-risk Black ever-smokers.[11] Additional models and analyses also support the utility of incorporating race and ethnicity in lung cancer screening criteria.[7,12] Using race and ethnicity to guide screening criteria for cancer is not unheard of; in 2017, the US Multi-Society Task Force recommended that Black individuals start colon cancer screening at age 45 years rather than the typical age of 50 years, before updating the guidelines again in 2021 to recommend that all adults start at age 45 years.[13,14]

Limitations

This study had the inherent weakness of being a retrospective study at a single institution. Additionally, the 7th edition of the International Association for the Study of Lung Cancer was published in 2010, during the 2005 to 2017 time frame from which our data was collected, leading to possible inconsistencies in staging between patients before and after 2010.[15] However, these changes in staging are unlikely to significantly impact the results for in this study, since the vast majority of the patients diagnosed with lung cancer stage I or II before 2010 would still be in the those 2 stages in the 2010 edition. Finally, specific to our patient population, it was often difficult to ascertain an accurate smoking history for each patient, especially in the early years of the data set, likely due to the disruption of care caused by Hurricane Katrina.

CONCLUSIONS

In this retrospective study performed at the SLVHCS in New Orleans, a significantly higher proportion of Black patients compared with White patients with early-stage lung cancer did not meet the 2013 USPSTF lung cancer screening guidelines at time of diagnosis, highlighting the concern that this population was being underscreened. These findings demonstrate the challenges and failures of applying national guidelines to a unique, high-risk population. An individualized, risk-based screening model incorporating race and ethnicity could be more effective at diagnosing early-stage lung cancer and requires more investigation. Centralized lung cancer screening programs within the VA system could also be beneficial for early detection and treatment, as well as provide insight into the increased risk within the veteran population.

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