Lung Cancer Screening of High Risk Patients

Related to Early Detection of Lung Cancer: Gulf Coast Medical Center

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Gulf Coast Medical Center used the guidelines of the National Comprehensive Cancer Network (NCCN), based on the National Lung Screening Trial (NLST) to screen high risk patients for lung cancer. Twenty self selected participants were screened with one patient being diagnosed with lung cancer. The percentage of negative screens and also false positives closely compared to the NLST study. The study was limited by the number of participants.

Introduction

The National Cancer Institute statistics indicate that 208,493 people in the United States were diagnosed with lung cancer and 158,592 died from the disease in 2008. The lifetime risk to develop lung cancer is 6.99% or 1 in 14. Almost 91% of the lung cancer deaths occur after the age of 55 years. The incidence of lung cancer for the United States is 64.1 while the incidence in Florida is 66.0 with an annual average of 16,044 individuals being diagnosed annually with lung cancer. Florida has a slightly higher than the national incidence, however, Bay county has an incidence of 85.4 and had 161 cases of lung cancer diagnosed in 2009 (National Cancer Institute (NCI)). Lung cancer is often diagnosed incidentally when a chest x-ray is completed for another reason. One fourth of lung cancer patients are asymptomatic, without any symptoms. The remaining three fourths may have a cough, become short of breath, have recurrent upper respiratory infections, wheezing, hoarseness, or cough up rusty colored or bloody sputum. Any of these symptoms could be attributed to other diagnoses, such as pneumonia, bronchitis, chronic obstructive pulmonary disease (COPD), or upper respiratory infection (WebMD).

The survival of lung cancer patients is affected by the stage at which the disease is detected. Localized disease, confined to the primary site, has a five year survival rate of 52.2%, but only comprises 15% of those diagnosed with lung cancer. Twenty-two percent of lung cancer is diagnosed as regional disease, spread to regional lymph nodes, and has a survival rate of 25.1%, while distant spread of the disease, through metastasis, has a survival rate of 3.7% at five years and comprises 56% of all lung cancer cases (NCI). Due to the late stage of the lung cancer at diagnosis, effective surgical and medical treatment is often not possible. An effort to diagnose lung cancer at an earlier stage in high risk patients caused the launch of lung cancer screening study.

The *New England Journal of Medicine* published the primary results from the NLST on June 29, 2011. The study screened 53,454 current or former heavy smokers ages 55 to 74. The findings revealed that participants receiving low-dose spiral Computerized Tomography (CT) scans had a 20% lower risk of dying from lung cancer than participants receiving standard chest x-rays.

"The National Comprehensive Cancer Network (NCCN) Lung Cancer Screening Panel recommends lung cancer screening using helical low-dose CT for individuals with the following high-risk Factors:

- Age 55 to 74 years; 30 or more pack-year history of smoking tobacco; and, if former smoker, have quit within 15 years (category 1). Some high risk individuals in the NLST also had COPD and other risk factors. This is a category 1 recommendation because these individuals are selected based on the NLST inclusion criteria. An NCCN category 1 recommendation is based on high-level evidence (randomized controlled trial) and uniform consensus

among panel members. Annual screening is recommended for these high-risk individuals until they are 74 years of ages based on the NLST. However uncertainty exists about the appropriate duration of screening and the age at which screening is no longer appropriate.

- Age 50 years or older, 20 or more pack-year history of smoking tobacco, and one additional risk factor (category 2B). This is a category 2B recommendation, because these individuals are selected based on nonrandomized studies and observational data. These additional risk factors were previously described and included cancer history, lung disease history, family history of lung cancer, radon exposure, and occupational exposure. Note that the NCCN Lung Cancer Screening Panel does not currently believe that exposure to second-hand smoke is an independent risk factor, because the data are either weak or variable. (2012)"

"These primary findings from the NLST provide a valuable insight into how to potentially decrease death due to lung cancer. But the most important method of decreasing lung cancer rates remains for smokers to quit smoking and for those who don't smoke to continue with their healthy behaviors," said NLST co-investigator, Christine Berg, M.D., of the NCI. In Bay County 23% of the population are smokers and surrounding counties have from 20-30% smokers.

The National Comprehensive Cancer Network (NCCN) Lung Cancer Screening Panel guidelines, based on the National Lung Screening Trial (NLST), were selected by Gulf Coast Medical Center (GCMC) to screen high risk patients for lung cancer. The lung cancer screening program allowed self selected high risk patients to be screened for lung cancer. The focus of the program was to identify lung cancer at an earlier stage and provide peace of mind for high risk individuals, regardless of their insurance status. The hypothesis was that the

results of the high-risk population screened would be similar to the results obtained in the low-dose spiral CT arm of the NLST study.

The public was informed of the program via a media campaign. Individuals then self selected to participate in the program. Once the screenings were completed, the results of the screenings were compared with the results of the NLST low-dose spiral CT results.

Materials and Methods

The National Comprehensive Cancer Network (NCCN) Lung Cancer Screening Panel guidelines and the National Lung Screening Trial (NLST), were utilized as references for development of the GCMC study. A screening tool was developed that mirrored the NCCN guidelines (Appendix A).

The public was informed of the GCMC program via news coverage on television and radio, print coverage and ads, and internet access. The advertising identified the high risk patients, benefits and risks, as well as the cost of the screening. Individuals calling for the testing were screened for appropriateness based on the NCCN criteria. When criteria were met, they were scheduled for the low-dose spiral CT screening. Currently, lung cancer screening is not covered by Medicare or private insurance. Therefore, GCMC adjusted the cash price within the reach of most individuals. The screening fee included the low-dose spiral CT, reading by a board-certified radiologist, and a review by a surgeon if the results were abnormal. All patients were given smoking cessation materials to either stop smoking or to remain smoke free. The patients were notified of results within 7 to 10 days both by phone and in writing. The results were also sent to their primary care physician, if requested.

The results of all the GCMC screenings for 2012 were compiled and compared with the low-dose spiral CT results of the NLST study.

Results

Negative	Lung Cancer	Pulmonary Nodule(s)	Other*
12	1	5	1- Adrenal adenoma 1 – Small breast cyst 1 – 2.1 cm breast mass 1 – 4.4 cm AAA

n=20 *two patients had pulmonary nodules and another abnormality

There were 30 calls related to the screening. Six individuals (20%) did not meet the criteria, and three (10%) who met criteria did not follow through and either did not schedule an appointment or cancelled their screening appointment. There is one individual who has changed the appointment three times, and has yet to complete the screening. Patients who completed the screening with negative results were 60% of those screened, and 70% were negative related to lung findings. Forty percent had one or more abnormality on their spiral low-dose chest CT. One patient did have lung cancer, which accounted for 16.6% of the patients with lung abnormalities, 12.5 % of those with any abnormality, and 5% of the total patients screened.

The patient with the positive lung cancer screening underwent a lung biopsy which was positive for lung cancer. A subsequent robotic assisted lobectomy was completed along with regional and mediastinal node dissection. All nodes were negative; therefore, the patient did not require additional neoadjuvant chemotherapy or radiation.

Discussion

The NLST study did identify abnormalities in 24.2% of the CT scans compared to 30% for the Gulf Coast Medical Center study. The majority of positive screens did result in additional testing. These positive NLST screens were false positive 96.4% of the time for the low-dose CT scans compared to 83.4% for the GCMC study. The false positives were probably due to detection of normal lymph nodes or inflamed tissues.

Limitations of the study are related to the small sample size and that the participants are self selected. Although statistics related to smoking and age would suggest that a larger number of individuals would elect to do the screening, this was not the case. Individuals that meet the criteria may deny that they are at risk or choose not to know their lung health status. The nominal fee for the screening may also be a deciding factor for those with limited or fixed incomes. The resulting small sample size causes the percentages to be skewed when even one lung cancer or lung abnormality is identified. A larger sample would produce more reliable data on which to base decisions. However, the limited number of participants did produce results that were similar to those of the NLST study.

Further study is indicated to determine the reluctance of individuals meeting the NCCN criteria from participating in the screening. Also, only three of the patients, were referred by primary care physicians and this may be another area of further study.

References

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Gulf Coast Medical Center Cancer Program

Lung Cancer Screening Questionnaire

(This information will be kept confidential and used only for future cancer education and research.)

☐ Order ☐ Scheduling ☐ Consent
☐ Appt ☐ Radiology ☐ Info Pkt

Section I To be completed regarding patient

Name		Date of Birth	Age
Street Address			
City	State	Zip Code	
Phone	Social Security Number		

PERSONAL PHYSICIAN INFORMATION:	1. When did you last have a complete physical exam by a doctor? _____
Name:	
Street Address:	2. When did you last have a Chest x-ray?_____
City State	
Phone Zip Code	3. Have you ever had a Chest CT? _____

Medical History

LUNG SCREENING

Do any of the following apply to you?	Yes	No	Other
≥ 55 years of age			
Current smoker			
30 pack years of smoking (# packs per day X # years smoking = pack years)			
Age started smoking Cigarettes per day			
Exposed to second hand smoke ≥ 10 years If yes, Number of years			
Ever diagnosed with:			
COPD			
Sarcoid Disease			
Pulmonary Fibrosis			
Interstitial Lung Disease			
Family history of lung cancer			
If yes, relationship to patient			
Would you like information about Smoking Cessation?			

How did you hear about this program? TV ad [ ] Newspaper ad [ ] Other (Explain)

What led you to seek out this screening test?

Comments:

Appointment for Screening Lung CT: [ ] Declined **Date** **Time**

Section II: Physician Order

Name _____

[X] **Lung Cancer Screening CT** (CPT: 71250)

Gulf Coast Medical Center Medical Diagnostic Center

Center's Address 2024 State Avenue, Panama City, FL Center's phone (850) 747-7775

_____ _____

N. Alexander Jones M. D. **Date** **Time**

Lung CT Exam Results

Patient Name:_____

Section III: Attach Radiograph Results to this form

Section IV: Results/Findings

LUNG CT RESULTS

- ☐ Normal
- ☐ Abnormal
- ☐ CT reviewed by Dr. Jones
- ☐ Recommendations for follow up: _____

_____

WAS THE PATIENT NOTIFIED OF FINDINGS?

☐ **Yes**

- ☐ Results called to patient: Date _____
- ☐ Results mailed to patient: Date _____ ☐ Dr. _____ Date: _____
- ☐ Further follow-up
  - ☐ Yes (Comment)_____
  - ☐ N/A

☐ **No**

- ☐ Patient did not answer calls (Date/times)_____
- ☐ Address no longer valid
- ☐ Other:_____

_____ _____

Oncology Navigator Signature Date

Comments