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Evaluating the Time Interval Between Symptoms Onset, Diagnosis, and Therapeutic Intervention in Lung Cancer: A Cross-Sectional Study in Southern Iran

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ABSTRACT

Background and Aim: Delay in diagnosis and treatment of lung cancer is thought to be a major cause of its poor outcomes. We evaluated the delays within the presentation to the initiation of diagnostic and therapeutic interventions amongst lung cancer patients in Southern Iran.

Methods: This cross-sectional study was conducted from March 2019 to March 2021. The data collected through interview included socio-demographic, medical and clinical findings, and the time intervals needed to visit physician, refer to specialist, request diagnostic procedures, reach diagnosis of lung cancer, and hospitalization.

Results: Eighty-nine patients (58 males and 31 females) with a mean age of 61.01 ± 12.25 years were included. The median time of symptom presentation and first physician visit interval was 25 days. Sixty-five days were spent for requesting, performing, and evaluating the diagnostic procedures. The median interval between diagnosis and initiation of treatment was 16 days. Totally, it took an average of 122 days from the presentation to the definite diagnosis of lung cancer. Patient-, diagnosis-, and treatment-related delays were not significantly correlated with any of the demographic, socioeconomic, and clinical (disease stage, symptom) variables, as well as the diagnosis tool and the first physician who visited the patient ($p > 0.05$).

Conclusions: There was a significant delay but relatively similar to other countries in the diagnosis and treatment of lung cancer patients in Southern Iran. The largest portion of delay could be attributed to the raising clinical suspicion in the physicians, referral for diagnostic assessments, and the diagnosis process.

1 | Background

Lung cancer is the leading cause of cancer-related mortality in men and second in women worldwide [1]. As a core concept in all cancers, prevention is the primary intervention against lung cancer. Currently, in addition to smokers, lung cancer is observed in non-smokers and ex-smokers, and our knowledge and ability are still insufficient to effectively prevent lung cancer [2, 3]. Due to the lack of public health initiatives for smoking cessation and lower access to health facilities, the incidence of lung cancer is increasing in our country as other low- to middle-income countries [4, 5].

Despite the use of various strategies and programs such as awareness programs, low-dose CT screening, targeting high-risk groups, the prognosis of lung cancer is still poor. For

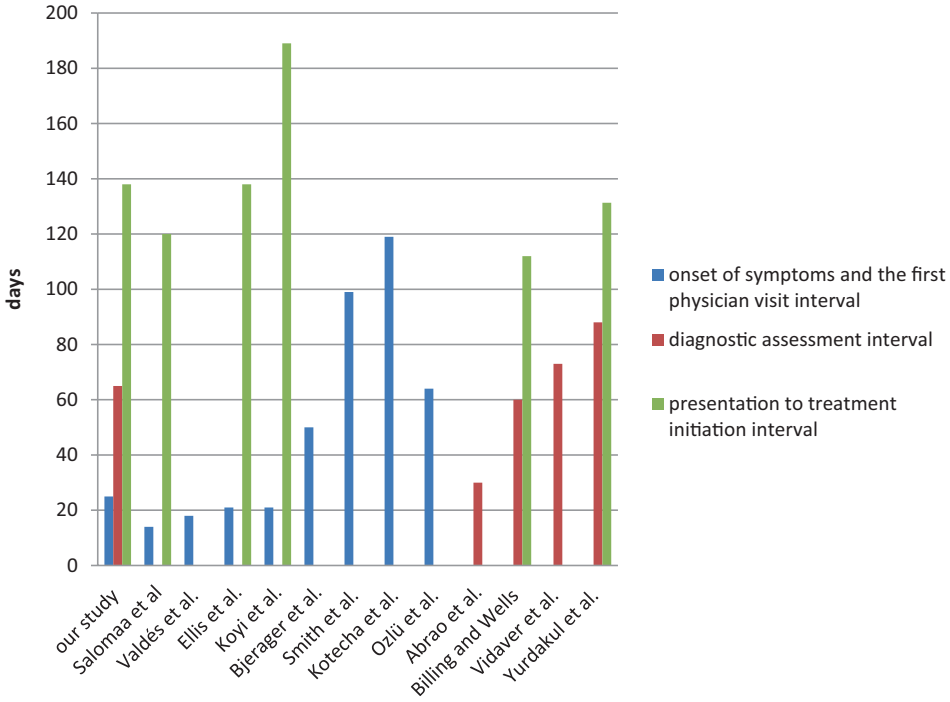

FIGURE 1 | Comparison of time intervals of presentation to first physician visit, diagnostic assessment and presentation to treatment in our study and other studies.

can contribute to remarkable differences in referral and diagnosis time intervals and consequently affect patient outcomes [48].

Last but not the least, a breakout, epidemic, or pandemic (i.e., COVID-19) can massively reframe a health care system, including redistribution of health service infrastructures (health workers, equipment, and facilities), financial barriers, lockdowns, fear of being infected in medical centers, and so forth. These changes might be led to a reduction in health service coverage, especially in low-to-middle-income countries [49]. However, in this regard, in our study there was no significant difference in patient-related delay, diagnosis, and initiation of lung cancer treatment before and after the COVID-19 pandemic.

The present study had at least three major limitations. First, the data were retrospectively collected, raising the possibility of recall bias. Second, the patients' survival was not assessed; hence, we could not investigate the correlation between the delay intervals and patients' survival. And third, because of the small sample size, we could not detect the patient's demographic/clinical variables responsible for various delays in lung cancer diagnosis. Also, due to the significant heterogeneity in local, national, and international health systems, our results are not generalizable.

Overall, there is a significant delay in the diagnosis and treatment of lung cancer patients in Southern Iran, like some other countries. Despite the limited population size, our findings might allow an initial assessment of the extent and causes and serve as a guide for establishment of educational interventions for the public, physicians, and health workers. It appeared that the largest proportion of delay in lung cancer diagnosis and treatment was related to raising the clinical suspicion in the physicians, referral for diagnostic assessments, and the diagnosis process. On the other hand, since interventions to reduce the patient's delay may be complex, the research on primary health care components can be another solution.

Author Contributions

Alireza Salehi: conceptualization, methodology, formal analysis. **Alireza Rezvani:** conceptualization, methodology. **Mohammad Javad Fallahi:** conceptualization, methodology, supervision, formal analysis. **Ghazal Gholamabbas:** writing – review and editing, writing – original draft, formal analysis. **Maryam Moayedfar:** writing – original draft, investigation.

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Ethics Statement

The protocol of this study was approved by the Ethics Committee of Shiraz University of Medical Sciences (code: IR.SUMS.REC.1398.208), and informed consent was obtained from all participants or their legal guardian(s).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.