PLATFORM C (HEALTH SCIENCE AND TECHNOLOGY)

THE TECHNOLOGY EVOLUTION OF LUNG CANCER SEVERITY DETECTION AMONG MALAYSIAN

Tamam. S.* and Kashfi Zaman, M.Z.

Faculty of Science & Technology, Universiti Sains Islam Malaysia, 71800 Nilai, Negeri Sembilan, Malaysia
**Corresponding author: sofinatamam@usim.edu.my,*

Keywords: *Lung Cancer Detection (LCD), Chest Radiography (CXR), Liquid Biopsy (LB), radiomics, biosensors.*

ABSTRACT

Lungs are the main organs for breathing and are part of the respiratory system. Subsequently, one lethal disease of cancer known as lung cancer is a type of malignancy that grows when abnormal cells in one or both lungs proliferate and reproduce uncontrollably. In the detection of lung cancer, some diagnosis assessment modalities can be employed for instance chest x-ray, computed tomography scan, and magnetic resonance imaging. Although these modalities are incredibly effective aids, a remarkable advancement in the field of lung cancer diagnostics should be implemented. The main goal of this research is to highlight current diagnostic techniques as well as some advanced diagnostic techniques for lung cancer severity detection among Malaysian as lung cancer is one of the most frequent cancers in Malaysia. The epidemiology along with the challenges regarding lung cancer screening are also emphasized.

INTRODUCTION

In Malaysia, several approaches for lung cancer detection (LCD) have been employed. Surveillance with sputum cytology and chest radiography (CXR) has remained used in the past to test for lung cancer [1]. Furthermore, imaging modalities for instance Computed Tomography (CT), Magnetic Resonance Imaging (MRI) with computer-aided diagnostic systems (CAD), and Positron Emission Tomography (PET), have also been utilized to analyze the images and data in detecting lung cancer and determining its aggressiveness [2]. However, CT is the extremely frequent imaging mode for staging since it is less expensive than a positron-emission tomography scan, which is usually reserved for patients with stage II or higher infection and is only available in private practice but both modalities are studied to be the most utilized aids while the application of chest radiography and ultrasonography for performance is infrequent [3].

The screening of lung cancer for early diagnosis is particularly necessary for those who have no signs or a history of lung cancer since it allows them to discover the disease earlier. The most general suggested lung cancer screening test is low-dose computed tomography (LDCT) [4]. The test is indicated for adults who are at a high risk of acquiring the condition due to a history of smoking, and it takes only a few minutes and is painless.

METHODOLOGY

The main goal of this research is to highlight current diagnostic techniques as well as some advanced diagnostic techniques for lung cancer severity detection among Malaysian as lung cancer is one of the most frequent cancers in Malaysia. The epidemiology along with the challenges regarding lung cancer screening are also emphasized. Therefore, this paper reviewed the previous latest studies related to technologies used to diagnose and classify lung cancers into their types and severity.

The review was divided into several categories involving; a) Epidemiology, b) The principle of screening, c) Basic diagnostic imaging techniques of lung cancers, d) The advanced technique used in the recognition of lung cancer in Malaysia, and, e) The challenges regarding lung cancer screening.

RESULT AND DISCUSSION

There are several problems and hurdles to optimum cancer care in resource-poor nations, they can be solved by using evidence-based, systematically sound, resource-level definite, economically achievable, socially suitable, pragmatic, and represent great clinical practice measures. The World Health Organization has advised that recommendations for the management of all major malignancies be developed that are resource-level suitable [5]. The use of guidelines must be adapted to the specific circumstances of each location. Certain tests or procedures may not be accessible in some nations or institutions within the same country. Reorganizing current human resources and infrastructure can significantly improve the situation. Strategic planning, healthcare worker training, simplifying approach to diagnostic and performance services, and civic education are just a few of the national and local initiatives that can support conquering some of the contests of employing lung cancer staging advances in resource-constrained settings. Furthermore, the universal health community must work together, with the help of local governments and primary healthcare systems, to develop cancer care, comprising diagnostic facilities, using appropriate methods for resource-constrained countries' health systems, widely available to low-income patients, and unified into national health assurance systems.

Many imaging modalities are actually can be used for diagnosing lung cancer and each of them provides a unique and informative solution in diagnostic imaging just like CT scan, but what distinguishes the functionality and the usage among them is the technique used in performing the quality of the images and the methods used in detection the abnormality. The focus examination of imaging techniques in this study then concentrates on the evolution of the imaging technique used among Malaysian that have their benefits to the people.

REFERENCES

[1] Sachithanandan, A., & Badmanaban, B. (2012). Screening for lung cancer in Malaysia: are we there yet. *Med J Malaysia*, *67*(1), 3-6.

[2] El-Baz, A., & Suri, J. (Eds.). (2019). *Lung imaging and CADx*. CRC Press.

[3] Rajadurai, P., How, S. H., Liam, C. K., Sachithanandan, A., Soon, S. Y., & Tho, L. M. (2020). Lung Cancer in Malaysia. *Journal of Thoracic Oncology*, *15*(3), 317-323. https://doi.org/10.1016/j.jtho. 2019.10.021.

[4] Kan Chan Siang, M. D., & John, C. K. M. (2016). A review of lung cancer research in Malaysia. *Med J Malaysia*, *71*, 71.

[5] Kan Chan Siang, M. D., & John, C. K. M. (2016). A review of lung cancer research in Malaysia. *Med J Malaysia*, *71*, 71.

ACKNOWLEDGMENT

This research has been funded by USIM's Research and Innovation Management Centre under grant number PPPI/FST/0119/051000/16819.