

Diagnosing Lung Cancer Using Neural Networks

R. Anto rose¹ K.V. Leelambika² M. Gowthami³

^{1,2,3}AP, Vel Tech Hightech Dr.Rangarajan Dr.Sakunthala Engineering College

Abstract— Artificial Neural Networks is the new technology. It is the branch of Artificial Intelligence and also it is an accepted new technology. Now a days Neural Networks Plays a Vital role in Medicine, Particularly in some fields such as cardiology, oncology etc. And also it has many applications in many areas like Science and Technology, Education, Business, Business and Manufacturing, etc. Neural Networks is most useful for making the decision more Effective. In this Paper, by the use of Neural Networks how the severe disease Lungs Cancer has been diagnosed more effectively. This Paper discussed about how the Lungs cancer can be identified effectively in earlier stages and diagnosed using Neural Networks and some devices. The Neural Networks has been successfully applied in Carcinogenesis. The main aim of this research is by the use of Neural Networks the Carcinogenesis can be diagnosed more cost-effective, easy to use techniques and methods. This Paper discussed about how the Lungs cancer can be identified effectively in earlier stages and diagnosed using Neural Networks and some devices. Sputum Cytology is used to detect the Lungs Cancer in Early stages.
Key words: Neural Networks, Sputum Cytology, Genetic

I. INTRODUCTION

Neural Networks is a collection of some efficient Programs and Data Structures that approximately operates like a Human Brain. It involves a huge number of Processors that operates in Parallel. Neural Networks has several applications like compressing the image, predicting the Stock Market, Medicine, Loan Application, Security etc. The Carcinogenesis is the initiation of the deadly disease Cancer. Because of the Carcinogenesis Unlimited Uncontrolled cell division will occur which leads to the growth of some dangerous malignant tumour. Uncontrolled division of cells occurs due to the mutation of the DNA in our body. Imbalance between the cells causes death.

Sputum Cytology is the technique which is used for finding the abnormal cells in our body. By the use of Sputum Cytology we can find the cancer in early stage itself.

The lungs and the airways which is present in the lungs produces Sputum. The Sputum is a mucus by the use of microscope we can find the abnormal cells. The Sputum samples are collected when the person coughs, breathing in saltwater and during Bronchoscopy.

The Bronchoscopy is new and an endoscopic technic this device is used for visualizing the airways which is present inside the lungs. Bronchoscopy is inserted into the airways of lungs via nose or mouth [4]. The Bronchoscopy finds out the abnormalities in lungs such as bleeding, foreign bodies, tumour etc.

Mostly the lungs cancer will affect the person who is smoking. Most of the women die annually because of lungs cancer rather than breast cancer. The lungs cancer is a deadly disease. There is no proper medicines for cancer if we find the disease in earlier stage then there is a possibility to cure. For predicting the deadly disease lungs cancer in earlier stage itself the Sputum and the Bronchoscopy technics are to be used.

II. TESTING LUNG CANCER

The lungs cancer is one of the deadly disease in all over the world. For Lungs cancer there is no proper treatment. If our lungs affected by cancer then we will die soon it causes breathing problem also. If we predict the Lungs cancer in earlier stage then we can cure [6]. But in earlier stager predicting the lungs cancer in earlier stage is very difficult.

The Symptoms of lungs cancer is severe cough, weight loss, difficulty in breathing, etc. The person who has been affected by lungs cancer will die within 5 years. If they diagnosed in early stages itself then they will live for long time. Without treatment there is no possibility to live. Mostly the cancer will affect the person who is having the habit of smoking and also it affects the persons who is working in cement industry, etc. There are several techniques are used in this paper.



Fig.1: Normal Lungs



Fig .2: Cancer Affected Lungs

There is a recent technology Sputum and Bronchoscopy is used to predict the lungs cancer in earlier stages.

III. RECENT ADVANCES

There are several recent advance technology are available which is used for identifying the lungs cancer in early stages.

A. Sputum Cytology

The deadly disease lungs cancer kills more number of humans in the world for predicting this deadly disease in the early stage is very difficult so only many peoples are dieing. So for predicting the lungs cancer earlier only this device is used. cancer in the earlier stage of the lungs cancer itself.

B. Bronchoscopy

The Bronchoscopy is a thin device which is used for viewing inside the airways and the lungs. It is usually inserted through the mouth or nose. By the use of this device we can find out the lungs cancer in the early stage itself.



Fig. 3. Bronchoscopy

If we predict the cancer in earlier stage there is a possible to cure. The Sputum is a mucus by the use of Microscope we can find out the abnormal cells which means it finds the cancer cells in our lungs. The Sputum cytology is a mucus which is mainly used for predict the lungs cancer diseases which means it predicts the abnormal cancer cells. The Sputum cytology which is used for predicting the lungs .

The Bronchoscopy is thin and it is made of fibre it can be inserted via throat or nose.

The Bronchoscopy is a thin device it predicts the cancer in the early stages. It is more effective than the other devices and also it is very easy to use.

C. Genetic Advances

There are two several genetic advances which are used for detecting the lungs cancer in earlier stages. They are several tests are available which is used for predicting the cancer in early stage low-dose spiral CT scanning, fluorescence bronchoscopy, and genetic screening.

The genetic (DNA) technic is used for predicting the DNA changes in our cell. Because of DNA mutation also the cancer will occur. The cancer disease will also cause because of the hereditary (gene).It deals with how the cells are to be multiplying and also it deals with how to reduce the cell splitting.

In cancer the cells will multiply and it affects the function of normal cell so that only death will occur. If we control the cell multiplication we can increase the life of the cancer affected people's life.

There are two several genetic advances which are used for detecting the lungs cancer in earlier stages. They are several tests are available which is used for predicting the cancer in early stage low-dose spiral CT scanning, fluorescence bronchoscopy, and genetic screening.

D. Low-Dose Spiral Computed Tomography

Low-dose spiral computed tomography (CT) test is used for scanning the lungs and also it detects the small early lungs cancer. It detects lungs cancer than chest X-rays[2]. Low-dose spiral CT is a advanced imaging technology in this the x-ray detectors rotate around the body to produce a three-dimensional image of the internal structures of the affected part. The full low-dose spiral CT lung cancer screening can be completed within a few seconds.

E. Fluorescence Bronchoscopy

The Fluorescence bronchoscopy is a new technology which is used for detecting the cancer cells. Fluorescence bronchoscopy is a new diagnostic cancer test that causes cancerous tissues to glow, or fluoresce, and thus look different from normal tissues size. From the picture we can know standard "black" light colour bulb causes light-coloured fabrics or the materials to glow in a dark room.

Fluorescence Bronchoscopy is used to find the cancer in early stages that might be missed by other devices.

F. Genetic Screening

It tells that the cancer is linked with DNA changes and can currently be detected by genetic tests. Some mutations may not appear until the last stage of disease[7]. Many of the research are going to find the genetic changes that appear early in the development of lung cancer. Once these are known, Neural Network that is Genetic(DNA) screening become one of the most valuable diagnostic tool.

IV. RISK OF LUNGS CANCER

Lungs cancer is a deadly disease it is very difficult to detect in early stages. The person who is having the habit of smoking will affect the lungs cancer soon and also the person who is working in leather company, factory like cement, coal, etc.it will affect cancer soon. Mostly the cancer will the people's based on our environmental factors. Mostly the Lungs cancer will affect the Men than Women.

Most of the lungs cancer is caused by tobacco, smoking, and alcohol. If we avoid all these thing then we can prevent our self from the deadly disease cancer. The person who resides near to the cement factory, leather factory also will get Lungs cancer. In some cases the Lungs cancer is caused by hereditary. For Non Smokers the Lungs Cancer will affect only in less Percentage. For Non Smoking Women's it will affect only 0.4% and for non- smoking Men it affects only 0.2%. For Smokers there is a high chances to get cancer.

Smoking	Men	Women
Non-smoker	0.2%	0.4%
Quit	5.5%	2.6%
Current	15.9%	9.5%
Heavy	24.4%	18.5%

Fig.4

The person who is smoking heavily will affect cancer in 24.4%. If it is detected in early stages then there is a possibility to survive more.

V. PERFORMANCE EVALUATION

After detecting the lungs cancer we have to take some treatment. If we detect the cancer in early stages then the possibility is high to increase the life of the cancer affected person. It involves a huge number of Processors that operates in Parallel. Neural Networks has several applications like

compressing the image, Predicting the Stock Market, Medicine, Loan Application, Security etc. Mostly the persons will die in lungs cancer. It causes breathing trouble. Other types of cancer we can predict easily but predicting the lungs cancer is very difficult.

The Bronchoscopy is new and an endoscopic technic this device is used forvisualizing the airways which is present inside the lungs. Bronchoscopy is inserted into the airways of lungs via nose or mouth [10]. The Bronchoscopy finds out the abnormalities in lungs such as bleeding, foreign bodies, tumour etc. The limitation of this device is if anyone ha small airways then it will not enter.

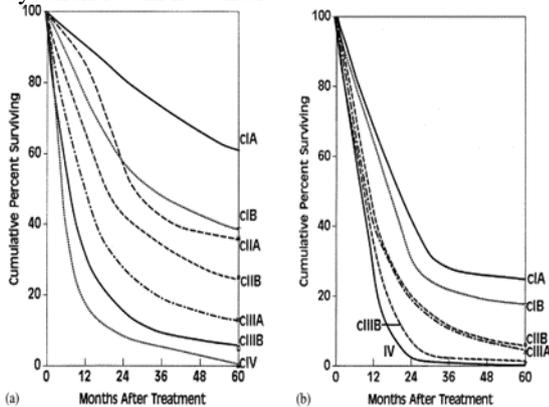


Fig. 4. Performance of Predicting and Curing the Lungs Cancer

The above graph describes the possibility of living after treatment. If we did not detect the lungs cancer in early stage then the person will die within 5 years. If we detect the cancer in early stages then there is a chance to increase the life of lungs cancer patient.

VI. CONCLUSION

This paper discussed about the detection of lungs cancer in earlier stages. Detecting the lungs cancer in earlier stage is very difficult so we used some new technologies to detect the lungs cancer earlier such as Fluorescence Bronchoscopy, Sputum technology, Neural Networks and genetic engineering. By the use of all these the lungs cancer can be detected in earlier stages. These technologies are more efficient and cheaper than the old technologies. We can save the life of cancer affected patients life by detecting the cancer in early stage.

REFERENCES

- [1] Strauss G, Decamp M, DiBiccaro E, et al. Lung cancer diagnosis is being made with increasing frequency in former cigarette smokers [abstract 1106]. *Proc Am Soc Clin Oncol* 1995; 14:362
- [2] Bechtel JJ, Kelley WR, Petty TL, et al. Outcome of 51 patients with roentgenographically occult lung cancer detected by sputum cytology testing. *Arch Intern Med* 1994; 154:975–970
- [3] Tockman MS, Gupta PK, Myers JD, et al. Sensitive and specific monoclonal antibody recognition of human lung cancer antigen on preserved sputum cells: a new approach to early lung cancer detection. *J Clin Oncol* 1988; 6:1685–1693

- [4] Bunn P, Carbone D, Grim J, et al. Fifth I.A.S.L.C. lung tumor biology workshop, August 13–17, 1996, Ermatingen, Switzerland. *Ann Oncol* 1997; 8:27–36
- [5] Prindiville S, Miller Y, Cook R, et al. Fluorescence bronchoscopy compared to white light bronchoscopy in the detection of high grade bronchial dysplasia [abstract]. *Proc Am Assoc Cancer Res* 1998; 39:117
- [6] Kaneko M, Eguchi K, Ohmatsu H, et al. Peripheral lung cancer: screening and detection with low dose spiral CT versus radiography. *Radiology* 1996; 201:798–802
- [7] Sobue T, Suzuki T, Naruke T, et al. Efficacy of lung cancer screening; comparison of results from a case-control study and a survival analysis. *Jpn J Cancer Res* 1992; 83:424–430
- [8] Prorok PC, Chamberlain J, Day NE, et al. UICC workshop on the evaluation of screening programes for cancer. *Int J Cancer* 1984; 34:1–4
- [9] Mountain CF, Dresler CM. Regional lymph node classification for lung cancer staging. *Chest* 1997; 111:1718–1723
- [10] McFarlane MJ, Feinsein AR, Wells CK. Clinical features of lung cancers discovered as a postmortem “surprise”. *Chest* 1986; 90:520–523