The Future of Lung Cancer: An Interview with Dr. Stephen Lam

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Introduction

Lung cancer causes the greatest number of cancer–related deaths worldwide.[1] Despite this sobering statistic, the five–year survival of lung cancer has only slightly improved from 15% during 1995-2000 to 18% during 2006-2012.[1,2] This is largely explained by the asymptomatic nature of lung cancer during its early stages. As a result, half of all lung cancer cases in Canada are diagnosed during advanced stages.[3]

Given the high frequency of individuals with stage III and IV lung cancer, lung cancer screening has been proposed. Dr. Stephen Lam, Leon Judah Blackmore Chair in Lung Cancer Research and MDS–Rix endowed Director of Translational Lung Cancer Research at the BC Cancer Research Center, is currently researching lung cancer risk prediction calculators with low–dose CT scans as a population–level screening method. In this paper, Dr. Stephen Lam will discuss the past, present, and future state of lung cancer.

Why do you focus your research on the early detection of lung cancer?

Lung cancer is the most common cause of cancer death in not only Canada, but around the world.[4] When I first began practicing medicine, the survival rate of lung cancer was around 5% to 8%. Presently, it is better, but still very poor at approximately 18%. I think this has not changed much because there is no lung cancer screening program in place. Early detection of lung cancer is key because treatments were and are still not very effective for patients with advanced lung cancer. I examined the global trends of different diseases and I noticed lung cancer is among the top five killers. I wanted to address this important health issue.

How has lung cancer treatment evolved over the past twenty years?

Firstly, we have much better surgical techniques. For small early cancers, we have developed image–guided surgery where a radiologist can insert a fuzzy wire into the nodule to enable the thoracic surgeon to precisely locate the tiny growth and remove it with a high degree of accuracy, without significantly compromising the lung function of a patient.[5] There are also new radiation therapies, such as stereotactic body radiation therapy, which can treat early stages of lung cancer for people who cannot or do not want surgery.[6] For patients with advanced lung cancer, there are exciting developments in targeted therapy and immunotherapy, although these are mostly palliative.

What do you think lung cancer screening will look like in ten years and how does the recent legalization of marijuana affect this?

I think it will be much more precise. Even today, there is now good evidence from two large randomized clinical trials that screening with low–dose CT scan can reduce lung cancer deaths by 20% or more.[7,8] With additional research, we will likely be able to identify people who should be screened based on numerous additional parameters such as environmental factors and perhaps blood or genetic tests. Analyses will also be more precise and rapid since CT scans will be read using deep learning. This will help to identify patients who need to be carefully watched or who need an early biopsy versus those with a slow growing cancer or benign nodule who can be more easily watched. Regarding the legalization of cannabis in Canada, it will be very difficult to study its effects on lung cancer. Unlike cigarettes where you can calculate how many cigarettes an individual smokes per day, one joint is not the same as another joint, and with the numerous ways people inhale marijuana, this makes it challenging to study.

Conclusion

Worldwide, lung cancer continues to cause the most cancer–related deaths.[9] This is partly explained by its common insidious progression, often resulting in advanced stages of lung cancer when patients present with symptoms. A limited number of surgical and radiation therapies have been developed over the years, and these are still ineffective at curing advanced lung cancer.

The work by Dr. Stephen Lam and his colleagues paves the way for improving the future of lung cancer diagnosis by encouraging the use of low–dose CT scans as a screening method for asymptomatic patients. Currently, research groups around the world are refining their screening processes by implementing environmental and genetic parameters into risk prediction models, attempting to use deep learning to accelerate CT scan readings, and modifying and comparing screening protocols amongst research groups. The current prognosis of lung cancer is abysmal, but the future of lung cancer screening and treatment is promising.

References

1. Siegel RL, Miller KD, Jemal A. Cancer Statistics, 2017. CA: *Cancer J Clin.* 2017 Jan;67(1):7-30.
2. Jemal A, Murray T, Ward E, Samuels A, Tiwari RC, Ghafoor A, et al. Cancer Statistics, 2005. CA: *Cancer J Clin.* 2005 Jan 1;55(1):10-30.
3. Canadian Cancer Statistics Advisory Committee. Canadian Cancer Statistics 2018 [Internet]. Toronto, ON: Canadian Cancer Society; 2018 [cited 2018 Sept 18]. Available from: cancer.ca/Canadian-Cancer-Statistics-2018-EN
4. Molina JR, Yang P, Cassivi SD, Schild SE, Adjei AA. Non–Small Cell Lung Cancer: Epidemiology, Risk Factors, Treatment, and Survivorship. *Mayo Clin Proc.* 2008 May 1;83(5):584-594.
5. Finley RJ, Mayo JR, Grant K, Clifton JC, English J, Leo J, et al. Preoperative computed tomography–guided microcoil localization of small peripheral pulmonary nodules: A prospective randomized controlled trial. *J Thorac Cardiovasc Surg.* 2015;149(1):26-32.
6. Abreu CE, Ferreira PP, de Moraes FY, Neves Jr, WF, Gadia R, Carvalho HdA. Stereotactic body radiotherapy in lung cancer: an update. *J Bras Pneumol.* 2015 Jul;41(4):376-387.
7. Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, et al. Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening. *N Engl J Med.* 2011;365(5):395-409.
8. De Koning H, Van Der Aalst C, Ten Haaf K, Oudkerk M. Effects of volume CT lung cancer screening: Mortality results of the NELSON randomized-controlled population based trial. Paper presented at: World Conference on Lung Cancer; 2018 Sept 25; Toronto, Canada.
9. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer.* 2015 Mar 01;136(5):359.

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