Journal of Cancer Research and Clinical Oncology (2018) 144:1395–1396
https://doi.org/10.1007/s00432-018-2655-z

LETTER TO THE EDITOR

"Commentary on: Lung cancer screening with MRI: results of the first screening round"—Michael Meier-Schroers et al.

Pei Ing Ngam[1] · **Joanna Zhi Jie Ling**[2]

Received: 19 March 2018 / Accepted: 27 April 2018 / Published online: 10 May 2018

Dear Editor,

We read with extreme interest the article by Meier-Schroers et al. (Meier-Schroers et al. 2018). This is a pretty well-done study with a few interesting points to discuss:

Meier-Schroers et al. mentioned all MRIs were anonymised in the first reading session. However, LDCTs were correlated with MRIs in the second reading indicating that LDCTs were read with knowledge of MRI findings. As the readers were not blinded to both LDCTs and MRIs, the study would be expected to have performance bias. This is because the knowledge of a positive MRI would possibly cause a reader to look harder to a positive result when reading the LDCT, inflating the number of positive LDCT results. This bias can be seen through the extremely high sensitivity and specificity from the study. In addition, the calculated positive and negative likelihood ratios for a pulmonary nodule more than or equal to 6 mm can be as high as infinite and as low as 0, respectively (Table 1), implying MRI thorax can serve as a reference standard and can function as both screening and confirmatory tests for lung cancer screening. As the authors highlighted in the title of the publication that this was the first screening round, we would recommend that study radiologists be blinded to both MRI and LDCTs in the consequent screening round(s) to avoid such bias. This will improve the validity of the study and reliability of the test results.

We notice that only mean age of the studied population was reported in the paper and no other demographic characteristics. It is well-known that spatial and temporal resolutions of the CT and MRI are affected by multiple factors with body habitus being a significant difference between European and Asian population. This will hence alter the parameters of the CT (Menke 2005; Sigal-Cinqualbre et al. 2004) and pulse sequences of the MRI (Biederer et al. 2012). Thus, the applicability of the low dose computed tomography (LDCT) and magnetic resonance imaging (MRI) protocols proposed in the paper in other countries, particularly in Asian populations, is questionable.

It was reported that the incidence of bronchial carcinoma diagnosed by lung cancer screening in the first year was 3.4%. The MRI-based early recall rate was 13.8 with 74.2% cases being a false-positive baseline screening result. The authors suggested MRI thorax can be an alternative to LDCT thorax as a lung cancer screening modality with the advantage that it obviates ionizing radiation exposure. However, we know that both LDCTs and MRIs tend to overcall a lesion as evidenced by their high false-positive results (Cieszanowski et al. 2016; Pinsky et al. 2017). This results in unnecessary investigations and is not socioeconomically effective. In addition, it may potentially cause harms (Ost and Gould 2012). Further advancements of MRI are required to reduce this high false-positive screening result.

This comment refers to the article available at https://doi.org/10.1007/s00432-017-2521-4.

An author's reply to this comment is available at https://doi.org/10.1007/s00432-018-2660-2.

✉ Pei Ing Ngam
pei_ing_ngam@nuhs.edu.sg

[1] Department of Diagnostic Imaging, National University Hospital Singapore, 5 Lower Kent Ridge Rd, Singapore 119074, Singapore

[2] Singapore Clinical Research Institute, 31 Biopolis Way, Singapore 138669, Singapore

Table 1 Sensitivity (Sn), specificity (Sp), positive predictive value (PPV), negative predictive value (NPV), area under curve (AUC) as well as calculated positive likelihood ratio [LR (+)] and negative likelihood ratio [LR (−)] of MRI (Meier-Schroers et al. 2018)

Pulmonary nodules	Sn	Sp	PPV	NPV	AUC	LR (+)	LR (−)
Solid nodules (mm)							
4–5	69.3	96.4	91.0	85.8	0.829	19.3	0.32
6–7	95.2	99.6	95.2	99.6	0.974	238	0.05
8–14	100	99.6	92.3	100	0.998	250	0.00
≥ 15	100	100	100	100	1.000	∞	0.00
Subsolid nodules (mm)							
< 20	72.7	99.2	80.0	98.8	0.860	90.9	0.28
≥ 20	–	–	–	–	–	–	–

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest regarding the present article.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of article, informed consent is not required.

References

Biederer J, Beer M, Hirsch W, Wild J, Fabel M, Puderbach M, Van Beek EJ (2012) MRI of the lung (2/3). Why … when … how? Insights Imaging 3:355–371. https://doi.org/10.1007/s13244-011-0146-8

Cieszanowski A et al (2016) MR imaging of pulmonary nodules: detection rate and accuracy of size estimation in comparison to computed tomography. PLoS One 11:e0156272. https://doi.org/10.1371/journal.pone.0156272

Meier-Schroers M, Homsi R, Skowasch D, Buermann J, Zipfel M, Schild HH, Thomas D (2018) Lung cancer screening with MRI: results of the first screening round. J Cancer Res Clin Oncol 144:117–125

Menke J (2005) Comparison of different body size parameters for individual dose adaptation in body CT of adults. Radiology 236:565–571. https://doi.org/10.1148/radiol.2362041327

Ost DE, Gould MK (2012) Decision making in patients with pulmonary nodules American. J Respir Crit Care Med 185:363–372. https://doi.org/10.1164/rccm.201104-0679CI

Pinsky PF, Bellinger CR, Miller DP Jr. (2017) False-positive screens and lung cancer risk in the National Lung Screening Trial: implications for shared decision-making J Med Screen:969141317727771 https://doi.org/10.1177/0969141317727771

Sigal-Cinqualbre AB, Hennequin R, Abada HT, Chen X, Paul JF (2004) Low-kilovoltage multi-detector row chest CT in adults: feasibility and effect on image quality and iodine dose. Radiology 231:169–174. https://doi.org/10.1148/radiol.2311030191