Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Cautions about radiologic diagnosis of COVID-19 infection driven by artificial intelligence

I read with interest the piece by Becky McCall[1] in *The Lancet Digital Health*. The author interviews several experts from different health-care sectors about the possible role of artificial intelligence (AI) in tackling coronavirus disease 2019 (COVID-19).

On the one hand, I agree that because AI is causing a paradigm shift in health care there could be many possible uses of AI during this COVID-19 outbreak.[1]

On the other hand, as a radiologist, I disagree with some of the optimistic expectations about the diagnostic value of a particular algorithm applied to lung CT images as outlined by McCall because, in my opinion, this is not yet supported by scientific evidence.

Unfortunately, the little evidence that has been reported shows that approximately 50% of patients with COVID-19 infection have a normal CT scan, if scanned early after the onset of symptoms.[2] This evidence is the main reason why the American College of Radiology does not consider CT imaging as a useful screening test in asymptomatic individuals.[3]

One of the experts that McCall interviewed states that "while a manual read of a CT scan can take up to 15 minutes, AI can finish reading the image in 10 seconds". I don't think this is in line with the daily diagnostic reality. To detect a diffuse lung parenchyma abnormality, a non-specialised radiologist takes a few seconds to scroll the entire image dataset and there is also no risk of not identifying the lesion because it is extremely obvious.

It is proposed to use AI assisted diagnosis with CT images in Wuhan, China, "as a surrogate for doctors when fast judgement is needed" if "PCR-based diagnosis takes too long (sometimes over a week)". However, a scientific paper reports that high-resolution CT findings cannot be considered pathognomonic of COVID-19 infection because they substantially overlap with other entities (ie, H1N1 influenza, cytomegalovirus pneumonia, or atypical pneumonia).[4] Also, more data are accumulating about different findings during the course of the disease, with late stages presenting with pulmonary consolidations indistinguishable from other non-viral infections.[5]

A paper published by Li and colleagues[6] reports excellent results, but only in the differential diagnosis with community acquired pneumonia, a bacterial pneumonia whose CT findings are completely different from COVID-19 infection and easy to differentiate, not only for AI, but also for human radiologists.

However, I deeply believe that AI can and should be used to support the work of a radiologist. I also believe that the objective quantification of the disease, expressed as a percentage of the pulmonary parenchyma involved, is currently the most interesting application of AI in COVID-19 infection, which will allow monitoring the course of the disease.[7] A precise quantification of lung involvement at the time of diagnosis might have prognostic value and an effect on the choice of therapy.

In conclusion, I felt it necessary to point out some aspects of the Article because they may generate unjustified expectations among doctors, policy makers, and citizens of my region in Italy.

AL has received speaker honorariums from GE Healthcare, Bracco, Bayer, Merck Sharp & Dohme, and Guerbet, all outside of the submitted work.

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