

Commentary

The debate still raged between the manufacturer of the dual source CT scanners versus the rest of the world as to the actual usefulness and the clinical application of the dual source CT scanners. The rest of the world argued that dual source has a higher lifetime cost as it uses 2 tubes whereas the proponents of the dual source CTs pointed to their better temporal resolution, dual energy features etc. Jiang et al in their meta-analysis look at dual source 64 detector row CT data versus single source 64 detector row CT data for the detection of coronary artery disease. In the 51 papers that they analysed the dual source came out ahead in terms of its specificity allowing better intervention decisions as compared to the single source. Having said this this applies only to coronary artery angiography and would be a valid consideration provided the scanners was to be used only or mostly for this indication. Most scanners in Pakistan are general purpose machines and are used for body CT as well as CT angiography (CTA) and therefore other considerations may outweigh this advantage. In any case the argument has moved on as the 64 MDCT is no longer the "State Of The Art" when it comes to high-end coronary CTA. The advent of scanners able to cover the entire heart in one rotation (both dual and single source) have changed the coronary CTA paradigm.

With the advent of quantitative analysis of Vitamin D in Pakistan it became apparent that we as a nation are significantly "deficient" of this important nutrient. This may reflect either a genetic tendency or our dietary and life style choices. Either way the low levels of Vitamin D are real. What I am not sure about is the true clinical implication of this low level. While the role of Vitamin D is well established in bone health and calcium metabolism its low levels are blamed for all sorts of ailments from constipation to depression (or depression due to constipation). In this context I am not sure if Pragera et al's contribution is helpful or not. They found a significant relationship between vitamin D and white matter T2 hyper intensities in independent adult outpatients, especially over the age of 50 years. The reason I am not sure if this is significant or not is because they do not elaborate a causal relationship between the two. It is like saying that I found a significant relationship between white hair and white matter T2 hyper intensities in independent adult outpatients, especially over the age of 50 years. The statement is valid but largely meaningless.

Nak Jong Seong et al give us a glimpse of what lies in store for all of us practicing radiology in acute care facilities. There is increasing demand from both the physicians and the patients for real time radiological reporting to facilitate care provision. They are no longer willing to base their decisions on opinions provided either by trainees or non credentialed/qualified radiologists. There is increasing deployment of technology to enable this to be done in a cost effective manner. This trend has also reached Pakistan and is not confined to private institutions only. The wide spread use of smart phones and social media applications such as WhatsApp allow low cost solutions to be rolled out. Although there is anecdotal evidence that this approach works, it is good to get some scientific data to support it. Nak Jong Seong's group looked at the simulated use of smartphones to supplement the reading of abdominal CTs for acute appendicitis. They find that the performance is comparable to the actual reporting of the CTs on diagnostic work stations. Radiologists not just in Pakistan but globally need to be at the forefront of these trends and technologies if we have to remain relevant to current medical practice.

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Dual-source CT versus single-source 64-section CT angiography for coronary artery disease: A meta-analysis

AIM: To perform a meta-analysis to compare the diagnostic performance of single-source 64-section computed tomography (CT) versus dual-source CT angiography for diagnosis of coronary artery disease (CAD).

MATERIALS AND METHODS: The Cochrane Library, MEDLINE, and EMBASE were searched for relevant original papers. Inclusion criteria were (1) significant CAD defined as $\geq 50\%$ reduction in luminal diameter by invasive coronary angiography as reference standard; (2) single-source 64-section CT or dual-source CT was used; (3) results were reported in absolute numbers of true-positive, false-positive, true-negative, and false-negative results or sufficiently detailed data for deriving these numbers were presented. A random-effects model was used for the meta-analysis.

RESULTS: Fifty-one papers including 3966 patients who underwent single-source 64-section CT and 2047

patients who underwent dual-source CT at a per-patient level were pooled. The diagnostic values of single-source 64-section CT versus dual-source CT were 97% versus 97% for sensitivity ($p = 0.386$), 78% versus 86% for specificity ($p < 0.001$), 90% versus 85% for positive predictive value (PPV; $p < 0.001$), 93% versus 97% for negative predictive value (NPV; $p = 0.001$), 6.8 versus 6.5 for positive likelihood ratio ($p = 0.018$), 0.04 versus 0.04 for negative likelihood ratio ($p = 0.625$), and 191.59 versus 207.37 for diagnostic odds ratio ($p = 0.043$), respectively.

CONCLUSION: Dual-source CT and single-source 64-section CT have similar negative likelihood ratios and, therefore, there was no significant difference in their utility to rule out CAD in intermediate-risk patients. However, compared to single-source 64-section CT, dual-source CT has significantly higher specificity, so that CT-based decisions for subsequent coronary catheter angiography are more accurate.

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Association of White Matter Hyperintensities with Low Serum 25-Hydroxyvitamin D Levels

BACKGROUND AND PURPOSE: Vitamin D deficiency is associated with cognitive impairment in the elderly and with increased white matter T2 hyperintensities in elderly debilitated patients. We investigated the relationship between serum vitamin D and brain MR findings in adult outpatients.

MATERIALS AND METHODS: Brain MR studies of 56 patients ages 30–69 years were selected when vitamin D level had been obtained within 90 days of the MRI. White matter T2 hyperintensities were characterized by size and location by two neuro-radiologists. Manual volumetric analysis was assessed in patients more than 50 years of age.

RESULTS: The entire cohort showed a significant negative relationship between serum 25-hydroxyvitamin D and the number of confluent juxtacortical white matter T2 hyperintensities ($P = .047$). The cohort ages 50 years and older showed stronger correlation between confluent white matter T2 hyperintensities and serum 25-hydroxyvitamin D in the juxtacortical region; number ($P = .015$) and size of white matter T2

hyperintensities ($P = .048$). Atrophy was not significantly related to serum 25-hydroxyvitamin D by radiologist visual analysis or by the bicaudate ratio.

CONCLUSIONS: We found a significant relationship between vitamin D and white matter T2 hyperintensities in independent adult outpatients, especially over the age of 50 years.

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Nak Jong Seong, Bohyoung Kim, Sungmin Lee, Hee Sun Park, Hyuk Jung Kim, Hyunsik Woo, Heung-Sik Kang and Kyoung Ho Lee

Off-Site Smartphone Reading of CT Images for Patients With Inconclusive Diagnoses of Appendicitis From On-Call Radiologists

OBJECTIVE: The purpose of this study was to simulate a mobile consultation in patients with inconclusive diagnosis of appendicitis made by on-call radiologists, as well as to measure the diagnostic confidence and performance of the mobile consultation.

MATERIALS AND METHODS: Two off-site abdominal radiologists interpreted the CT images from 68 patients (including 29 patients with confirmed appendicitis) on a smart-phone for whom the preliminary CT reports by 25 in-house on-call radiologists were inconclusive. The smartphone readings were compared with the preliminary reports by on-call radiologists and with the original final reports by in-house abdominal radiologists. Heat maps, kappa statistics, Wilcoxon signed-rank tests, and ROC curves were used for data analysis.

RESULTS: The heat maps and kappa statistics showed that the smartphone readings were more similar to

the final reports than to the preliminary reports. In diagnosing or ruling out appendicitis, the smartphone readings were more confident than the preliminary reports ($p = 0.01$) and did not significantly differ in diagnostic confidence from the final reports ($p = 0.19$). The AUCs of the smartphone readings (0.91 and 0.92) did not differ significantly from those of the preliminary (0.85) or final (0.97) reports ($p = 0.09$).

CONCLUSION: With the given study sample, the diagnostic performance of the off-site smartphone readings did not differ significantly from that of the in-house preliminary reports. However, the smartphone readings provided higher diagnostic confidence than the preliminary reports.