Letter by Chakrabarti and Pererato Regarding Article, “Smartphone Teleradiology Application Is Successfully Incorporated Into a Telestroke Network Environment”

To the Editor:

We read with great interest the study by Demaerschalk et al1 in the September edition of Stroke, regarding the validity of smartphone-based assessment of brain computerized tomography scans in the context of acute stroke syndromes. We commend the authors on their excellent study and believe it would be enhanced by discussion of the following issues.

The ability to view images on a smartphone of sufficient quality to detect subtle pathology remains a valid concern. The authors demonstrate a high level of agreement for identification of intracranial hemorrhage, neoplasm, or any radiological contraindication to thrombolysis on an iPhone 4 display compared with PACS and desktop. However, the level of agreement diminishes for early ischemic changes and hyperdense artery sign. This may be partially attributed to the small sample size, but perhaps a property of the lower resolution and small screen area inherent to the viewing interface. Recently, Lamirel et al2 faced a similar issue when reviewing nonmydriatic retinal images taken in an emergency department environment and displayed on an iPhone 3G where the authors concluded that it was possible to evaluate emergent pathology (eg, papilledema) but not subtle changes, such as diabetic retinopathy. In the context of stroke-like presentations, it may be argued that the greatest benefit of such technologies would be for the early identification and management of the subtle or borderline cases. Thus, a useful follow-up study involving recruitment of more subtle lesions would provide interesting insights.

Demaerschalk et al1 conducted their study on an iPhone 4 (Apple Inc), which was initially released in 2010. Since then, there have been significant advances made in smartphone display capabilities. Although the slightly larger screen size of the iPhone 5 is unlikely to have a significant impact on teleradiology, the iPhone 5 has significant advances in display technology allowing higher-contrast ratings, a wider color gamut, and decreased reflectance. Smartphones are generally used in situations with high-ambient light, and it is important to note that the iPhone 5 has a far better contrast rating in high-ambient light when compared with the iPhone 4, resulting in better screen readability.3 This may facilitate easier identification of subtle pathologies on an iPhone 5 screen. Furthermore, it would be interesting to see the results of a similar study using the larger screen of a tablet device.

One limitation of the ResolutionMD system is the requirement to have access to the hospital PACS server. An alternative is the use of video multimedia message service. An emerging body of evidence has demonstrated the capacity for video recording and transfer of a sequence of computerized tomography images from a PACS system for the evaluation of referable neurosurgical pathology.4 5 The primary advantage of the use of video multimedia message service is the accessibility it offers to all physicians who carry a smartphone. Future studies could consider assessing the agreement in interpretation between ResolutionMD images and video multimedia message service.

We agree with the authors that telemedicine has significant potential for facilitating early diagnosis and timely access to treatment in the context of stroke. Further validation studies exploring the spectrum of options offered by emerging mobile health technologies will enhance its value as an adjunct to clinical decision making.

Disclosures

None.

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