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A systematic review on the usefulness of computed tomography angiography in diagnosing brain death

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Background: Organ transplantation depends more often of donation from brain dead (BD) individuals. Several complications make the diagnosis of BD medically challenging and a complimentary method is needed for confirmation. Additionally, in many countries around the world, the complimentary diagnosis is mandatory by law, despite there are still many areas where these methods are not available. In this context, computed tomography angiography (CTA) could represent a valuable alternative, because of its widespread presence. However, the reliability of CTA for confirming brain circulatory arrest remains unclear.

Aim: A systematic review was done on the usefulness of computed tomography angiography in diagnosing brain death.

Methods: A systematic review was performed to identify relevant studies regarding the use of CTA as ancillary test for BD confirmation. Guidelines for online search were followed, and the QUADAS 2 tool was used to verify study quality. Data from the studies were extracted aiming to perform the meta-analysis.

Results: Ten low quality studies were found. Due to the absence of controls in all studies, specificity could not be calculated. Three hundred twenty-two patients were eligible for the meta-analysis, which exhibited 84.7% sensitivity. CTA image evaluation protocol exhibited variations between medical institutions regarding which intracranial vessels should be considered to determine positive or negative test results.

Conclusions: For patients who were previously diagnosed with BD according to clinical criteria, CTA demonstrated high sensitivity to verify intracranial circulatory arrest. The current evidence that supports the use of CTA in BD diagnosis is comparable to other methods applied worldwide. Considering the importance of this subject, high quality studies are currently missing and needed.

Biography

Sergio Brasil is a Neurosurgeon and Neurosonologist. Currently, he is performing research in the field of Cerebral Hemodynamics and Transcranial Doppler.

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