

INTRODUCTION and PURPOSE

Migrainous aura (MA) is a complex of neurological symptoms associated with migraine attacks and characterized by gradual evolution, usually over 5–20 minutes, and maximum duration of 60 minutes for each individual symptom. The acute-onset of MA can be erroneously mistaken for an acute stroke (AS). MA represents 3% of the so-called “Stroke mimics” (SM). A complete diagnostic workup with neuroimaging is mandatory for an accurate differential diagnosis between MA and SM. FMRI and SPECT studies have demonstrated that migrainous aura may be associated with perfusion abnormalities. Relatively few studies have been performed with Computer Tomography perfusion (pCT). In the present study, pCT perfusion patterns in patients with acute-onset of migrainous aura are analysed.

METHODOLOGY: CT PERFUSION

CT perfusion allows for visualization of cerebral auto regulation mechanisms by providing qualitative and quantitative measurements of cerebral blood flow and volume. CTP parameters that are commonly calculated include CBF (cerebral blood flow), CBV (cerebral blood volume) and MTT (mean transit time). CBF is defined as the volume of flowing blood moving through a given volume of brain in a specific amount of time; CBV is defined as the volume of flowing blood for a given volume of brain; MTT is the average amount of time it takes blood to transit through the given volume of brain. The aim of CT perfusion is to discriminate the infarct core (irreversibly damaged brain tissue) from penumbra (brain tissue at risk of irreversible damage).

CASE PRESENTATION

In our experience from January 2016 until June 2016, 40 patients were admitted to our Emergency Department for migrainous aura, of those patients two presented with symptoms mimicking a stroke. The case of a 43-year-old male with acute onset of left hemiparesis and that of a 36-year-old female complaining of blurred vision in the right hemifield, both with mild headache, presenting to the Emergency Department with suspected AS are reported. The first patient usually suffered from migraine with visual aura, the second one never had headache in the past. Brain-CT, angio-CT of intra- and extracranial vessels and PCT were performed one hour after symptoms onset. These tests showed no acute lesions (ASPECT 10) nor perfusion abnormalities. In our patients CTP parametric maps demonstrate symmetric brain perfusion, see Figure 1 and Figure 2. By contrast in patients with acute stroke with the same symptoms, CTP shows matched areas of decreased CBF and CBV with increased MTT (core infarct) and regions of decreased CBF with maintained CBV and prolonged MTT (penumbra), see Figure 3.

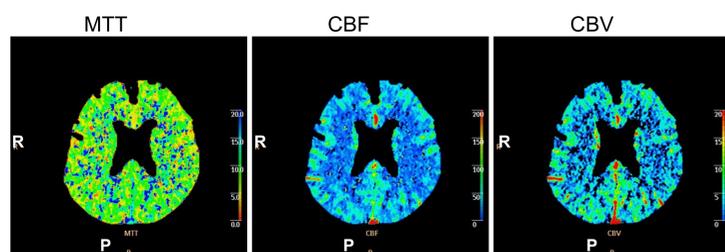


Figure 1: A 43-year-old male with left hemiparesis.

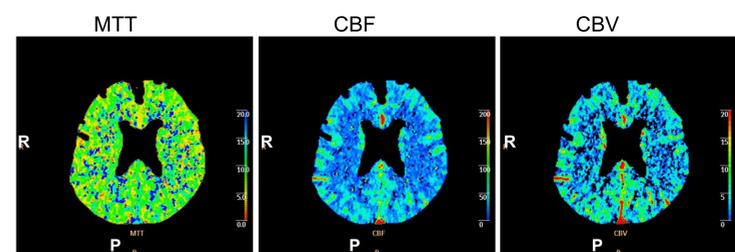


Figure 2: A 36-year-old female with blurred vision in the right hemifield.

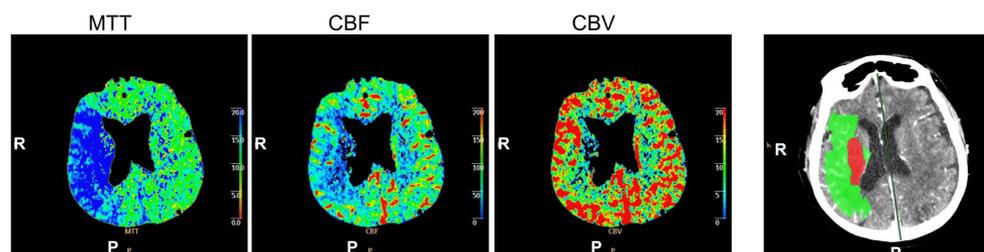


Figure 3: A 86-year-old man with left hemiparesis.

In our cases, left hemiparesis and blurred vision fully recovered in ten and two hours respectively. A 24-hour control brain-CT scan, brain MRI, diagnostic tests for cerebrovascular diseases, and the genetic tests for hemiplegic migraine, were normal in both patients. Patients were dismissed with diagnoses of probable sporadic hemiplegic migraine and probable migraine with typical aura, respectively, according with ICHD-3 beta criteria.

CONCLUSIONS

Migrainous aura could present as a stroke in patient with acute-onset of neurological symptoms.

Perfusional imaging can help the clinician in their differential diagnosis. In the two cases illustrated here, normal CT perfusion findings were detected in patient with hyperacute stage of a migrainous aura. Altered perfusion parameters are more often suggestive of acute stroke.

Our data suggest that pCT could be an useful tool to improve diagnostic accuracy in the discrimination between MA and AS, avoiding unnecessary reperfusion therapies.

REFERENCES

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- [3] Forster A, Wenz H, Kerl HU, Brockmann MA, Groden C. Perfusion patterns in migraine with aura. *Cephalalgia.* 2014;34(11):870-6