Author's response to reviews

Title: Focal subarachnoid haemorrhage mimicking transient ischaemic attack - do we really need MRI in acute stage?

Authors:

Lorenz Ertl (lorenz.ertl@med.uni-muenchen.de)
Dominik Morhard (dominik.morhard@klinikum-muenchen.de)
Maria Deckert-Schmitz (maria.deckert-schmitz@klinikum-muenchen.de)
Jennifer Linn (jennifer.linn@med.uni-muenchen.de)
Gernot Schulte-Altedorneburg
(gernot.schulte-altedorneburg@klinikum-muenchen.de)

Version: 3
Date: 9 March 2014

Author's response to reviews: see over
To whom it may concern

Cover letter – Revisions of “1012492767112383 - Focal subarachnoid haemorrhage mimicking transient ischaemic attack - do we really need MRI in acute stage”

Munich, 9th of March 2014

Dear Ladies and Gentlemen,

We thank you very much for your additional comments on our article!

Please find attached our point-by-point response to your concerns.

We hope to have met your expectations and are heading forward to hearing from you.

Yours sincerely,
Lorenz Ertl on behalf of all authors.
1. “Since the main presentation of the patients mimic TIA, it is important to declare for each patient if the vascular study (extra and intracranial circulation) was normal or not. This is relevant since several cases of carotid stenosis were reported in association with focal SAH. (This study may be included in the reference list - Geraldes R, et al. Nontraumatic Convexity Subarachnoid Hemorrhage: Different Etiologies and Outcomes. Journal of Stroke and Cerebrovascular Diseases 23.1 (2014): e23-e30)”

All patients had received intracranial and extracranial vascular imaging.

“In all cases imaging protocol included […] time-of-flight MR angiography (TOF-MRA) of the intracranial arteries. [...] Phase-contrast (PC)-MRA of the cerebral veins and sinuses was obtained in six patients (pat. 1, 2, 4-7). Patient 4 underwent intra- & extracranial CTA.”

We added the following paragraph to ‘Methods’:

“**Additional vascular imaging**

All patients underwent extracranial doppler sonography. Conventional four-vessel angiography was performed in two patients (patients 1 and 3), whereas cervical contrast enhanced MRA was available in two cases (patients 1 and 7).”

We referred to it in ‘Results’ as follows:

“In none of the cases vascular imaging revealed a stenosis of > 50 % lumen reduction or showed evidence for vasculitis, RCVS or any other vascular malformation.”

We cited the study of Geraldes R, et al. as described in comment on 4.)

2. „It is also important that article does not give the impression that CT is sufficient to investigate a patient with a suspected TIA, so I recommend the authors to follow the suggestion of the reviewer”

Please see the comment on 5.).

3. „It is not relevant to include illustrating figures in Background. I suggest to remove them.“

As suggested, we removed all illustrating figures.

4. „Please change the sentence in Discussion ‘The aetiology of fSAH is still unclear’, because there are identified aetiologies for fSAH, although in some patients it may remain unclear.”

We changed above mentioned sentence and cited the study of Geraldes R, et al. in this context as follows:
“Several aetiologies have been found to be associated with fSAH [8] [11]. According to Kumar, the most probable cause of fSAH in patients older than 60 years is cerebral amyloid angiopathy (CAA), while reversible cerebral vasoconstriction syndrome (RCVS) is the most common aetiology in patients younger than 60 years [8]. Geraldes et al. found large artery atherosclerosis to be the most probable underlying cause in one third of fSAH patients [11].”

5. „An important point that needs to be clearly mentioned in the final article is that frequently patients present with a history of transient focal neurological episodes some time previously (e.g. not within 48 hours of the event), or have an acute event but have a history of previous attacks in the past. In these situations CT will not be helpful in ruling out previous subarachnoid bleeding and an MRI with blood-sensitive sequences (T2* or SWI) is essential. A CT should thus not be considered sufficient to investigate transient neurological episodes and cannot be used to guide antithrombotic use on its own. It is understood that MRI is not widely available 24/7, but this should be the standard that we are aiming for, rather than accepting the limitations of current services. These points need to be clearly acknowledged in the final article.”

We definitely agreed that MRI remains crucial and represents gold standard in imaging of patients with a history of transient focal neurological episodes. Unenhanced CT is not sufficient to investigate transient neurological episodes on its own and only can be considered as a first line diagnostic tool in patients with transient neurological episodes if (1) immediate MRI is not available (2) time interval from last episode is < 48 h and (3) MRI work-up is completed as soon as possible.

In order to clarify this issue we integrated the following changes:

**Abstract, Conclusion, p.3**  “Thin-sliced unenhanced CT is a valuable emergency diagnostic tool to rule out intracranial haemorrhage including fSAH in patients with acute transient neurological episodes if immediate MRI is not available. However, MRI work-up is crucial and mandatorily has to be completed within the next 24-72 hours”

**Discussion, p. 12/13**  „Unlike previous studies, our patients (except pat. no. 4) suffered from an acute transient focal neurological episode within 24 hours prior to the CT. In patients, whose last neurological episode dates back more than 48 hour, MRI should be preferred as primary diagnostic tool. “

**Conclusion, p. 13**  „Unenhanced CT is a valuable emergency diagnostic tool to rule out acute intracranial haemorrhage including fSAH in patients with transient neurological episodes if immediate MRI is not available. However, we emphasize that a single unenhanced CT scan cannot be considered sufficient to investigate transient neurological episodes and to guide antithrombotic use on its own. MRI work-up is indispensable for the further detection of SS, MB, and other parenchymal abnormalities and has to be completed within the next 24-72 hours.”