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Letter to the Editor

Before NAION can be Attributed to Air Travel in a Polymorbid Elderly Patient, all Possible other causes must be Thoroughly Ruled out

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We were interested to read the article by Noorani *et al*. about a woman with sudden loss of vision in the left eye during a flight, which was attributed to non-arteritic anterior ischemic optic neuropathy (NAION) [1]. The patient had a high cardiovascular risk profile, including arterial hypertension, hyperlipidemia, migraine and two malignancies [1]. Decreased left visual acuity, left papilledema, right relative afferent pupillary defect (RAPD), right optic atrophy, right retinal nerve fiber layer (RNFL) narrowing, and left RNFL thickening were noted [1]. Acute MRI was normal, but three months later MRI showed acute pons microinfarction, brain atrophy and significant microvascular changes [1]. The study is noteworthy, but some points should be discussed.

The first point is that the alleged causal link between the flight and NAION has not been proven. The patient had a significant cardiovascular risk profile, suggesting that one of these risk factors was more likely responsible for the NAION than the conditions on the flight. The patient had arterial hypertension, hyperlipidemia, migraine, uterine cancer and hepatocellular carcinoma [1]. Before attributing NAION to the flight conditions, it is essential that all other possible causes of NAION are ruled out. It must be ruled out that the patient had newly developed diabetes, that arterial hypertension and hyperlipidemia were poorly controlled, and that one of the two carcinomas was still active. As the blood pressure was elevated after the flight, it cannot be ruled out that a hypertensive crisis during the flight was the cause. Did the patient suffer a migraine attack shortly before or during the flight? As the patient also regularly took glucocorticoids and glucocorticoids increase the risk of thrombosis [2], it cannot be ruled out that the NAION is due to a side effect of the glucocorticoids. Furthermore, all positive and negative coagulopathies (e.g. APC resistance, prothrombin mutation, protein S-protein deficiency, protein-C deficiency, antiphospholipid antibody syndrome) must be adequately excluded. As the patient was taking omeprazole and omeprazole can be associated with eye damage, it would have been imperative to exclude a side effect of omeprazole as the cause of NAION [3].

The second point is that the cause of the vision loss four months before the vision loss in the left eye was not reported [1]. Did the vision loss on the right side also occur during a flight? If it did not occur during a flight, it is unlikely that the vision loss due to NAION on the left side was due to in-flight conditions rather than other causes. Since the patient had a history of embolization of a carotid cavernous fistula treated by endovascular embolization, we should know whether it occurred on the right or left side or bilaterally. Was the embolization complicated by any side effects?

The third point is that we disagree with the localization of the DWI lesion in the pons as indicated in the caption of Figure 1 [1]. The DWI hyperintensity lesion shown there is located in the tegmentum of the midbrain. A sagittal image of the brainstem should be shown to confirm this localization.

The fourth point is that endocarditis can only be ruled out by transesophageal echocardiography. Transthoracic echocardiography can miss endocarditis. Since the patient had suffered a stroke three months after the loss of left vision, a transient ischemic attack should also be ruled out as the cause of the loss of left vision. As the patient also had a deep vein thrombosis, a pulmonary embolism must be excluded.

Finally, it is not understandable why the MRI was normal on admission but showed atrophy and microvascular changes three months later. What has happened in the meantime?

To summarize, this interesting study has limitations that affect the results and their interpretation. Addressing these limitations could strengthen the conclusions and support the message of the study. All open questions need to be clarified before readers uncritically accept the study's conclusions. It is more likely that NAION in the index patient is due to micro- or

macroangiopathy, cardiomyopathy, or coagulopathy than to flight conditions. Before attributing NAION to air travel in a polymorbid elderly patient, all other possible causes must be thoroughly ruled out.

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