



Editorial

The multifactorial etiology of stroke-associated pneumonia



The occurrence of hospital-acquired pneumonia is the most common, feared complication after a stroke that impairs outcomes leading to death and disability (1,2).

There are two different definitions of stroke related pneumonia that are used in the literature. The most used standard definition of stroke-related pneumonia is that it occurs within 2-3 days after admission and other that occurs during hospitalization (3,4).

The causes of pneumonia after a stroke are multi-factorial and range from mostly not preventable to actively-induced by medications (1,2,5–7).

By far the dysphagia with the risk of aspiration is the most common cause of stroke related pneumonia in addition to the humeral and neurological pathomechanisms affecting the immune system due to the stroke (2,8).

The development of stroke related pneumonia can worsen the prognosis and reduce the chance of recovery from a stroke. However, in spite of the recognized and established knowledge of the risk of stroke pneumonia, the dysphagia screening is not applied naturally on every patient with an acute stroke and even if performed, it is not done on time and with delay which increases the risk of pneumonia (1).

The treatment of stroke patients, particularly those with intracerebral haemorrhage requires a treatment in the intensive care, or semi intensive care including administration of medical treatment with an acid suppressive medication (ASM) including a Proton pump inhibitor (PPI) or Histamine-2 Receptor Antagonist (H2RA) to prevent gastritis. On one hand, these medications are needed for stress ulcer prophylaxis and to prevent gastritis or upper gastrointestinal bleeding, especially in patients taking non-steroidal anti-inflammatory drugs or on therapy with an oral anticoagulation/antiplatelet agents, but on the other hand the (over)-use of ASM could increase the risk of stroke-related pneumonia development (9–11).

Critically ill patients may benefit from a treatment with ASM, therefore the guidelines of American Society of Health System Pharmacists recommend ASM only for selected stroke patients who are treated in the intensive care unit, whereas the routine use of ASM on non-ICU or semi-ICU is controversially debated and not recommended (12).

In this Issue of the Journal of Neurological Sciences, Marchina and Colleagues (13) conducted a comprehensive meta-analysis to test the association between ASM and the risk of hospital acquired pneumonia in patients suffering from a stroke.

Five clinical and observational studies were included. Ischemic strokes were included in 3 studies whereas haemorrhage stroke was included in all 5 studies. The ASM (H2RA) was investigated in 4 studies whereas PPI was investigated in all studies.

The patients' cohorts range from 200 to 1435 stroke patients. The results of the meta-analysis revealed significantly a higher risk of

stroke-related pneumonia for patients receiving PPI (adjusted relative risk (RR); 2.37, 95%-CI; 1.36–4.17). An association between H2Ras and stroke-related pneumonia was not found (RR; 1.7, 95%-CI; 0.7–4.2).

In the overall (unadjusted) testing of the ASM-group versus the non-ASM group, an increase of the pneumonia risk for patients receiving ASM was found (RR; 4.65, 95%-CI; 1.64–13.16). The findings of the meta-analysis are comparable with a previous study, Merzing et al. (7) which have found that the association of stroke related pneumonia was significant for PPI (OR, 1.3; 95%-CI, 1.1–1.4), but not for H2Ras (OR, 1.2; 95%-CI, 0.98–1.4).

In spite of the study strengths, including the statistical power and rigorous methodology, the authors included patients with ischemic and haemorrhagic strokes that may be different in the severity of the stroke, whereas it is well-known that stroke patients who are severely affected may be at a higher risk of developing a stroke-related pneumonia than those who are not. Stroke symptoms; dysphagia, altered consciousness, immobility or reduced communication ability) may support the high risk of stroke related pneumonia.

Generally speaking, patients with a haemorrhagic stroke may be treated at the ICU and are more likely to receive ASM than patients with an ischemic stroke. The data included in the study population is heterogeneous and is not as robust, but suggestive of the increased risk of stroke-related pneumonia.

In summary, the hospitalized stroke patients received ASM. The administration of ASM, particularly PPI may be associated with high risk of stroke-related pneumonia which is caused by multi-factorial etiology. We need to learn more about the risk of factors and the pathomechanisms of the development of pneumonia after suffering from a stroke, especially in the cases that are capable of being influenced and preventable to avoid pneumonia and improve the outcome after a stroke (14,15).

ASM medications may be needed in stroke patients, but their administration should be carefully considered. Physicians should also balance the risk and clinical benefits of every medication that is given to stroke patients.

Conflict of interests

None.

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Mohamed Al-Khaled*

Department of Neurology, University of Lübeck, Lübeck, Germany

E-mail address: Mohamed.al-khaled@neuro.uni-luebeck.de.

* Corresponding author at: Department of Neurology, University of Lübeck, Ratzeburger Allee 160, 23538 Lübeck, Germany.