

Time is Brain. Rupture of a brain aneurysm and the patients journey to the neurosurgical center

In brain infarction or traumatic injuries of the brain an immediate admission to a neurosurgical / neurological center can be life saving. With brain hemorrhages caused by a ruptured aneurysm the situation is not as clear. First of all patients can lose consciousness immediately and will not be able to provide a history. At arrival of the emergency response team the patient can be unconscious, without obvious external trauma and more important, with a pathological electrocardiogram. The ambulance team can come to the wrong conclusion of cardiac infarction and initiate admission to a cardiology unit. Coronary artery arteriography will follow which shows no pathological signs. After that a computed tomography of the head (CCT) reveals a subarachnoid hemorrhage in the brain. Now transport to a neurosurgical unit follows and the patient receives adequate treatment (i.e. ICU, blood pressure control, brain angiography, relieving brain pressure by ventricular drainage, endovascular treatment or surgery). Through admission to other, non-neurosurgical units, time is lost which leads to a significant death rate of such patients.

In another scenario the patient is awake and complains about headaches but is otherwise neurologically intact. With a diagnosis of migraine, admission to a neurological unit can be performed and since the patient is awake, CCT can be delayed for hours. After CCT reveals a subarachnoid hemorrhage immediate transport to a neurosurgical unit follows but still, hours of accurate treatment are lost which can cost the patients life.

In our study we show that in cases of misdiagnosis, transportation to a neurosurgical unit lasts 262 minutes whereas in cases of right diagnosis and immediate transport to neurosurgery, transportation time was only 71 minutes. The longer the transportation time was the greater the death rate of patients.

To prevent such delays, the first response team as well as the patients or their relatives have to deliver an accurate history of the patient's condition and stress out the symptom of excruciating headaches and neck stiffness which are two of the typical symptoms in aneurysmatic rupture and brain bleeding. Immediate therapy could save lives in this condition which can be fatal in 30-40% of cases.

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Publication

[Increased mortality of patients with aneurysmatic subarachnoid hemorrhage caused by prolonged](#)

[transport time to a high-volume neurosurgical unit.](#)

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