

Commentary on Cerebral Edema

Aida Ibrahim*

Department of Physiology, Bauchi State University, Gadau, Nigeria

Corresponding Author*

Aida Ibrahim,
Department of Physiology,
Bauchi State University,
Gadau, Nigeria
E-mail: ibrahimaida469@gmail.com

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Description

Cerebral edema is also called as brain swelling. It's a life-threatening state that leads fluid to develop in the brain. This fluid raises the pressure inside of the skull more frequently referred to as Intracranial Pressure (ICP). Increased ICP helps to reduce brain blood flow and decrease the oxygen receives the brain. The brain requires a continuous flow of oxygen to function accurately.

Brain swelling can be very challenging to treat. It can also cause irreversible harm. The swelling can occur throughout the brain or in some particular areas. Left untreated, cerebral edema can be deadly. Edema is a response to several forms of brain injury, and the reasons can be characterized as cytotoxic, vasogenic, interstitial, or combined. Identification of the leading imaging form, in combination with extra radiologic results and clinical history, often yields clues to the diagnosis. CT is the early screening examination for patients giving with new-onset neurologic symptoms. On CT, edema demonstrates as reduced attenuation comparative to surrounding normal parenchyma. Standard CT brain observing settings highlight the contrast between gray and white matter, but narrower stroke window settings emphasize principal areas of hypodensity. Abnormalities can be characterized in terms of position; pattern of gray-white matter participation and associated mass effect as evidenced by midline shift; sulcal, ventricular, cisternal effacement; and cerebral herniation.

Coronal and sagittal multiplanar reorganization images are often useful for further localization and quantification. MRI provides good soft-tissue contrast resolution and thus is often needed for evaluation of underlying lesions. On MRI, edema produces high signal on T2-weighted imaging and low signal on T1-weighted imaging. Diffusion Weighted Imaging (DWI) and Apparent Diffusion Coefficient (ADC) sequences distinguish between cytotoxic edema (restricted diffusion) and vasogenic or interstitial edema (normal or increased diffusion). Diffusion Tensor Imaging (DTI) uses tensor analysis to calculate the degree of anisotropy on the basis of the magnitude and direction of water diffusion in each voxel in the brain. The most commonly used parameter is fractional anisotropy. It reflects the principal directional eigenvector of molecular wave and is used in white matter tractography.

Time-of-flight images and irregular flow voids can suggest the occurrence of a vascular malformation. Contrast development can be found in neoplasms, active infection or inflammation, and vascular lesions. Signs of cerebral edema are nonspecific and connected to secondary mass effect, vascular compromise, and herniation. Clinical and radiologic deviations are normally reversible in the early stages as long as the underlying cause is corrected. For treatment of the cerebral edema, doctors use drugs to reduce swelling or blood clots. Warfarin is a kind of medicine which thins the blood and controls the chances of blood clots.

In some cases, doctor may suggest aspirin, but because of the risk of bleeding current guidelines no longer advise this for most people. Surgery may be essential to reduce ICP. In surgery a part of the skull removes and repairs the damage, such as a ruptured blood vessel. Ventriculostomy is another possible procedure which involves injecting a plastic tube into the skull to drain excess fluid and reduce ICP. Hypothermia is a form of therapy includes lowering the body temperature, which can decrease swelling in the brain.

Osmotherapy involves using medications to eradicate water from the brain to help increase blood flow to the brain and reduce ICP.

Conclusion

Cerebral edemas can have severe and permanent consequences. The viewpoint can differ significantly, depending on the exact location and severity of the edema, as well as how fast a person receives treatment. Though diagnosing cerebral edema is challenging, it is essential for doctors to provide instant and proper medical care to minimize the risk of complications. Sometimes it can be treated with medication and rest.