Hematoencephalic barrier

The hematoencephalic barrier (in the strict sense of the word) forms the **transition between the brain capillaries and brain tissue**. The morphological basis of the blood-brain barrier is a continuous layer of the endothelium of the brain capillaries, the basement membrane and a layer of astrocytes on the blood side.. The endothelium of cerebral capillaries differs from the endothelium in other localizations in that it is free of fenestrations and the endothelial cells are connected by (tight junction). Astrocyte processes together with pericytes (microglial cells) are attached to the basement membrane.

The transfer of substances from the blood to the brain is based on their solubility in fats or by means of carrier systems. Water and lipid-soluble substances (např. ethanol, nicotine, gases – O_2, CO_2, N_2O) are easily transported.. Essential hydrophilic substances are transported to the brain by specific transport systems (glucose, neutrální amino acids). Vesicular transport is very limited. An intact blood-brain barrier makes it virtually impossible for macromolecules to penetrate the brain tissue.The penetration of substances into the brain is also prevented by the enzymatic barrier, which involves enzyme systems localized in the walls of brain blood vessels (e.g. monoamine oxidases –enzymes degrading monoamines, aminopeptidases - enzymes degrading enkephalins).

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References

DANIEL, Růžek. *Klíšťová encefalitida.* - edition. Grada Publishing, a.s., 2015. 200 pp. ISBN 9788024753058.