

DAFTAR PUSTAKA

1. Albrecht J., Mark J., McCunn M. Increased Rates of Mild Traumatic Brain Injury Among Older Adults in US Emergency Departments, 2009-2010. *J Head Trauma Rehabil.* 2016;31(5).
2. Pratama SA. Gambaran Gejala Klinis Dan Hasil Pemeriksaan Ct Scan Kepala Pada Pasien Cedera Kepala Dengan Gcs 13-15 Di Ruang Rawat Inap Penyakit Saraf Bougenvil Rsud Dr. H. Abdul Moeloek Provinsi Lampung. *Jurnal Ilmu Kedokteran dan Kesehatan.* 2020;7(2):448–56.
3. Kemenkes RI. Hasil Riset Kesehatan Dasar Tahun 2018. Kementrian Kesehatan RI. 2018;53(9):1689–99.
4. Stokum J, Gerzanich V, Simard J. Molecular pathophysiology of cerebral edema. *J Cereb Blood Flow Metab.* 2016 Mar;36(3):513–38.
5. Kochanek KD, Xu J, Murphy SL, Miniño AM, Kung HC. Deaths: final data for 2009. *Natl Vital Stat Rep.* 2011 Dec 29;60(3):1–116.
6. Chu H, Huang C, Ding H, Dong J, Gao Z, Yang X, et al. Aquaporin-4 and Cerebrovascular Diseases. *Int J Mol Sci [Internet].* 2016 Aug 11;17(8):1249. Available from: <http://www.mdpi.com/1422-0067/17/8/1249>
7. Xu M, Su W, Xu QP. Aquaporin-4 and traumatic brain edema. Vol. 13, *Chinese Journal of Traumatology - English Edition.* Chinese Journal of Traumatology (English Edition); 2010. p. 103–10.
8. Szczygielski J, Kopańska M, Wysocka A, Oertel J. Cerebral Microcirculation, Perivascular Unit, and Glymphatic System: Role of Aquaporin-4 as the Gatekeeper for Water Homeostasis. *Front Neurol.* 2021 Dec 13;12.
9. Mayer CL, Huber BR, Peskind E, Mayer CL, Peskind ER. Traumatic Brain Injury, Neuroinflammation, and Post-Traumatic Headaches. *Headache.* 2013;53(9):1523–30.
10. Blennow K, Brody DL, Kochanek PM, Levin H, McKee A, Ribbers GM, et al. Traumatic brain injuries. *Nat Rev Dis Primers.* 2016 Nov 17;2.
11. El Sayed T, Mota A, Fraternali F, Ortiz M. Biomechanics of traumatic brain injury. *Comput Methods Appl Mech Eng.* 2008 Oct 15;197(51–52):4692–701.
12. Davanzo JR, Sieg EP, Timmons SD. Management of Traumatic Brain Injury. Vol. 97, *Surgical Clinics of North America.* W.B. Saunders; 2017. p. 1237–53.
13. Bordone MP, Salman MM, Titus HE, Amini E, Andersen J V, Chakraborti B, et al. The energetic brain - A review from students to students. *J Neurochem.* 2019 Oct;151(2):139–65.
14. Halsey AM, Conner AC, Bill RM, Logan A, Ahmed Z. Aquaporins and Their Regulation after Spinal Cord Injury. *Cells.* 2018 Oct 18;7(10).
15. Salman MM, Kitchen P, Halsey A, Wang MX, Törnroth-Horsefield S, Conner AC, et al. Emerging roles for dynamic aquaporin-4 subcellular relocalization in CNS water homeostasis. *Brain [Internet].* 2022 Jan 1 [cited 2024 Feb 18];145(1):64–75. Available from: <https://pubmed.ncbi.nlm.nih.gov/34499128/>
16. Abbott R. The endoscopic management of arachnoidal cysts. *Neurosurg Clin N Am.* 2004 Jan;15(1):9-17. doi: 10.1016/S1042-3680(03)00071-8. PMID: 15062399.
17. Fishman RA. Brain edema. *Physiology in Medicine.* 1975;293(14):706–11
18. Klatzo I. Evolution of Brain Edema Concepts. Vol. 60, *Acta Neurochir.* 1994.

19. Nakada T, Kwee IL. Fluid dynamics inside the brain barrier: current concept of interstitial flow, glymphatic flow, and cerebrospinal fluid circulation in the brain. *Neuroscientist* 2019;25(2):155–166
20. Pillinger NL, Kam P. Endothelial glycocalyx: basic science and clinical implications. *Anaesth Intensive Care* 2017;45(3):295–307
21. Woodcock TE, Woodcock TM. Revised Starling equation and the glycocalyx model of transvascular fluid exchange: an improved paradigm for prescribing intravenous fluid therapy. *Br J Anaesth* 2012;108(3):384–394
22. Ando Y, Okada H, Takemura G, et al. Brain-specific ultrastructure of capillary endothelial glycocalyx and its possible contribution for blood brain barrier. *Sci Rep* 2018;8(1):17523
23. Zhu J, Li X, Yin J, Hu Y, Gu Y, Pan S. Glycocalyx degradation leads to blood-brain barrier dysfunction and brain edema after asphyxia cardiac arrest in rats. *J Cereb Blood Flow Metab* 2018;38(11):1979–1992
24. Keep RF, Andjelkovic AV, Xiang J, et al. Brain endothelial cell junctions after cerebral hemorrhage: Changes, mechanisms and therapeutic targets. *J Cereb Blood Flow Metab* 2018;38(8):1255–1275
25. Nakada T, Kwee IL, Igarashi H, Suzuki Y. Aquaporin-4 functionality and Virchow-Robin space water dynamics: physiological model for neurovascular coupling and glymphatic flow. *Int J Mol Sci* 2017;18(8):1798
26. Manley GT, Zador Z, Stiver S, Wang V. Role of aquaporin-4 in cerebral edema and stroke. Vol. 190, *Handbook of Experimental Pharmacology*. 2009. p. 159–70
27. Speake, T., Whitwell, C., Kajita, H., Majid, A., and Brown, P. (2001) Mechanisms of CSF secretion by the choroid plexus. *Microsc. Res. Tech.* **52**, 49–59
28. Zador Z, Bloch O, Yao X, Manley GT. Aquaporins: role in cerebral edema and brain water balance. *Prog Brain Res.* 2007;161:185–194
29. Morris AWJ, Sharp MM, Albargothy NJ, et al. Vascular basement membranes as pathways for the passage of fluid into and out of the brain. *Acta Neuropathol* 2016;131(5):725–736
30. Thrane AS, Rangroo Thrane V, Nedergaard M. Drowning stars: reassessing the role of astrocytes in brain edema. *Trends Neurosci* 2014;37(11):620–628
31. Tang G, Yang GY. Aquaporin-4: a potential therapeutic target for cerebral edema. *Int J Mol Sci* 2016;17(10):E1413
32. Fukuda AM, Badaut J. Aquaporin 4: a player in cerebral edema and neuroinflammation. *J Neuroinflammation* 2012;9:279
33. Dalby T, Wohl E, Dinsmore M, Unger Z, Chowdhury T, Venkatraghavan L. Pathophysiology of Cerebral Edema-A Comprehensive Review. Vol. 8, *Journal of Neuroanaesthesiology and Critical Care*. Georg Thieme Verlag; 2021. p. 163–72
34. Halstead MR, Geocadin RG. The Medical Management of Cerebral Edema: Past, Present, and Future Therapies. *Neurotherapeutics*. 2019 Oct 1;16(4):1133–48
35. Klatzo I. Evolution of Brain Edema Concepts. Vol. 60, *Acta Neurochir.* 1994. (18-35)
36. Zador Z, Bloch O, Yao X, Manley GT. Aquaporins: role in cerebral edema and brain water balance. Vol. 161, *Progress in Brain Research*. 2007. p. 185–94
37. Simard JM, Kent TA, Chen M, Tarasov K V, Gerzanich V. Brain oedema in focal ischaemia: molecular pathophysiology and theoretical implications. *Lancet Neurol.* 2007 Mar;6(3):258–68

37. Badaut J, Ashwal S, Obenaus A. Aquaporins in cerebrovascular disease: a target for treatment of brain edema? *Cerebrovasc Dis.* 2011;31(6):521–31
38. Mestre H, Du T, Sweeney AM, Liu G, Samson AJ, Peng W, et al. Cerebrospinal fluid influx drives acute ischemic tissue swelling. *Science.* 2020 Mar 13;367(6483)
39. Ayloo S, Gu C. Transcytosis at the blood-brain barrier. *Curr Opin Neurobiol.* 2019 Aug;57:32–8.
40. King ZA, Sheth KN, Kimberly WT, Simard JM. Profile of intravenous glyburide for the prevention of cerebral edema following large hemispheric infarction: evidence to date. *Drug Des Devel Ther.* 2018;12:2539–52
41. Saraiva C, Praça C, Ferreira R, Santos T, Ferreira L, Bernardino L. Nanoparticle-mediated brain drug delivery: Overcoming blood–brain barrier to treat neurodegenerative diseases. *Journal of Controlled Release.* 2016 Aug;235:34–47
42. Varatharaj A, Galea I. The blood-brain barrier in systemic inflammation. *Brain Behav Immun.* 2017 Feb;60:1–12.
43. Dhanda S, Sandhir R. Blood-Brain Barrier Permeability Is Exacerbated in Experimental Model of Hepatic Encephalopathy via MMP-9 Activation and Downregulation of Tight Junction Proteins. *Mol Neurobiol.* 2017 May 18
44. Michinaga S, Koyama Y. Protection of the Blood–Brain Barrier as a Therapeutic Strategy for Brain Damage. *Biol Pharm Bull.* 2017;40(5):569–75
45. Wan Y, Holste KG, Hua Y, Keep RF, Xi G. Brain edema formation and therapy after intracerebral hemorrhage. *Neurobiol Dis.* 2023 Jan 1;176
46. Stokum JA, Gerzanich V, Simard JM. Molecular pathophysiology of cerebral edema. Vol. 36, *Journal of Cerebral Blood Flow and Metabolism.* Nature Publishing Group; 2016. p. 513–38.
47. Hui L, Shanquan S, Mei Y, Guoping Q, Weihua Y, Fei Z. Role of aquaporin-4 in the formation of brain edema after mild traumatic brain injury in rat. *Chinese Journal of Anatomy.* 2009;(1):68–72
48. Wei XE, Zhang YZ, Li YH, Li MH, Li W Bin. Dynamics of rabbit brain edema in focal lesion and perilesion area after traumatic brain injury: A MRI study. *J Neurotrauma.* 2012 Sep 20;29(14):2413–20
49. Lu H, Lei XY, Hu H, He ZP. Relationship between AQP4 expression and structural damage to the blood-brain barrier at early stages of traumatic brain injury in rats. *Chin Med J (Engl).* 2013;126(22):4316–21
50. Zhang C, Chen J, Lu H. Expression of aquaporin-4 and pathological characteristics of brain injury in a rat model of traumatic brain injury. *Mol Med Rep.* 2015 Sep 1;12(5):7351–7.
51. Verkman AS, Smith AJ, Phuan P wah, Tradtrantip L, Anderson MO. The aquaporin-4 water channel as a potential drug target in neurological disorders. *Expert Opin Ther Targets.* 2017 Dec 2;21(12):1161–70.
52. Shi Z, Zhang W, Lu Y, Lu Y, Xu L, Fang Q, et al. Aquaporin 4-Mediated Glutamate-Induced Astrocyte Swelling Is Partially Mediated through Metabotropic Glutamate Receptor 5 Activation. *Front Cell Neurosci.* 2017 Apr 28;11.
53. Smith AJ, Verkman AS. CrossTalk opposing view: Going against the flow: interstitial solute transport in brain is diffusive and aquaporin-4 independent. *J Physiol.* 2019 Sep 6;597(17):4421–4

54. Wambo TO, Rodriguez RA, Chen LY. Computing osmotic permeabilities of aquaporins AQP4, AQP5, and GlpF from near-equilibrium simulations. *Biochimica et Biophysica Acta (BBA) - Biomembranes*. 2017 Aug;1859(8):1310–6
55. Ikeshima-Kataoka H. Neuroimmunological Implications of AQP4 in Astrocytes. *Int J Mol Sci*. 2016 Aug 10;17(8):1306.
56. Zhang M, Cui Z, Cui H, Cao Y, Wang Y, Zhong C. Astaxanthin alleviates cerebral edema by modulating NKCC1 and AQP4 expression after traumatic brain injury in mice. *BMC Neurosci*. 2016 Dec 31;17(1):60
57. Mestre H, Hablitz LM, Xavier AL, Feng W, Zou W, Pu T, et al. Aquaporin-4-dependent glymphatic solute transport in the rodent brain. *Elife*. 2018 Dec 18;7
58. Bloch O, Papadopoulos MC, Manley GT, Verkman AS. Aquaporin-4 gene deletion in mice increases focal edema associated with staphylococcal brain abscess. *J Neurochem*. 2005 Oct;95(1):254–62.
59. Papadopoulos MC, Manley GT, Krishna S, Verkman AS. Aquaporin-4 facilitates reabsorption of excess fluid in vasogenic brain edema. *The FASEB Journal*. 2004 Aug;18(11):1291–3
60. ZHANG C, CHEN J, LU H. Expression of aquaporin-4 and pathological characteristics of brain injury in a rat model of traumatic brain injury. *Mol Med Rep*. 2015 Nov;12(5):7351–7
61. Assentoft M, Larsen BR, MacAulay N. Regulation and Function of AQP4 in the Central Nervous System. *Neurochem Res*. 2015 Dec 29;40(12):2615–27
62. Mahajan S, Bhagat H. Cerebral oedema: Pathophysiological mechanisms and experimental therapies. *J Neuroanaesth Crit Care*. 2016 Dec 5;03(04):S22–8
63. Yao X, Derugin N, Manley GT, Verkman AS. Reduced brain edema and infarct volume in aquaporin-4 deficient mice after transient focal cerebral ischemia. *Neurosci Lett*. 2015 Jan;584:368–72.
64. Stokum JA, Kurland DB, Gerzanich V, Simard JM. Mechanisms of Astrocyte-Mediated Cerebral Edema. *Neurochem Res*. 2015 Feb 5;40(2):317–28
65. Verkman AS, Smith AJ, Phuan P wah, Tradtrantip L, Anderson MO. The aquaporin-4 water channel as a potential drug target in neurological disorders. *Expert Opin Ther Targets*. 2017 Dec 2;21(12):1161–70
66. Han D, Sun M, He P ping, Wen L lu, Zhang H, Feng J. Ischemic Postconditioning Alleviates Brain Edema After Focal Cerebral Ischemia Reperfusion in Rats Through Down-Regulation of Aquaporin-4. *Journal of Molecular Neuroscience*. 2015 Jul 8;56(3):722–9
67. R.A.Nasution, A.A.Islam, M.Hatta, Prihantono, Warsinggih. Effects of caffeic acid phenethyl ester in reducing cerebral edema in rat subjects experiencing brain injury : An in vivo study. 2020 Aug;328-333
68. Thiagarajah JR, Papadopoulos MC, Verkman AS. Noninvasive early detection of brain edema in mice by near-infrared light scattering. *J Neurosci Res*. 2005 Apr 15;80(2):293–9
69. Brightman MW. The brain's interstitial clefts and their glial walls. *J Neurocytol*. 2002;31:595–603
70. Clément T, Rodriguez-Grande B, Badaut J. Aquaporins in brain edema. *J Neurosci Res*. 2020 Jan;98(1):9–18.

71. Elbanna E, Rezk N, Abdel Moniem A, Abdel Rahman S. Diagnostic utility of aquaporin-4 blood level in neonatal hypoxic ischemic encephalopathy. *Zagazig University Medical Journal* [Internet]. 2023;29(1.1):173–81. Available from: https://zumj.journals.ekb.eg/article_109439.html
72. KEMENKES RI. Pedomana nasional pelayanan kedokteran tata laksana cedera otak traumatik, KEMENKES RI .2022
73. Haj-Yasein NN, Vindedal GF, Eilert-Olsen M, Gundersen GA, Skare Ø, Laake P, Klungland A, Thorén AE, Burkhardt JM, Ottersen OP, Nagelhus EA. Glial-conditional deletion of aquaporin-4 (Aqp4) reduces blood-brain water uptake and confers barrier function on perivascular astrocyte endfeet. *Proc Natl Acad Sci U S A*. 2011 Oct 25;108(43):17815–20. doi: 10.1073/pnas.1110655108. Epub 2011 Oct 11. PMID: 21990350; PMCID: PMC3203818.
74. Abir-Awan M, Kitchen P, Salman MM, Conner MT, Conner AC, Bill RM. Inhibitors of Mammalian Aquaporin Water Channels. *Int J Mol Sci*. 2019 Mar 29;20(7):1589. doi: 10.3390/ijms20071589. PMID: 30934923; PMCID: PMC6480248.
75. Vella J, Zammit C, Di Giovanni G, Muscat R, Valentino M. The central role of aquaporins in the pathophysiology of ischemic stroke. *Front Cell Neurosci*. 2015 Apr 8;9:108. doi: 10.3389/fncel.2015.00108. PMID: 25904843; PMCID: PMC4389728.
76. Hua Y, Ying X, Qian Y, Liu H, Lan Y, Xie A, Zhu X. Physiological and pathological impact of AQP4 knockout in mice. *Biosci Rep*. 2019 May 14;39(5):BSR20182303. doi: 10.1042/BSR20182303. PMID: 31023968; PMCID: PMC6522737.
77. Guo Q, Sayeed I, Baronne LM, Hoffman SW, Guennoun R, Stein DG. Progesterone administration modulates AQP4 expression and edema after traumatic brain injury in male rats. *Exp Neurol*. 2006 Apr;198(2):469–78. doi: 10.1016/j.expneurol.2005.12.013. Epub 2006 Jan 27. PMID: 16445913.
78. Fukuda AM, Pop V, Spagnoli D, Ashwal S, Obenaus A, Badaut J. Delayed increase of astrocytic aquaporin 4 after juvenile traumatic brain injury: possible role in edema resolution? *Neuroscience*. 2012 Oct 11;222:366–78. doi: 10.1016/j.neuroscience.2012.06.033. Epub 2012 Jun 21. PMID: 22728101; PMCID: PMC3482829.
79. Hsu, Y.; Tran, M.; Linninger, A. A. Dynamic regulation of aquaporin-4 water channels in neurological disorders. *Croat Med J*. 2015, 56, 401
80. Ginsberg Lionel, *Neurology*. Wiley Black Well, 2010.
81. Sopiudin D, *Besar sampel dan cara pengambilan sampel dalam penelitian Kedokteran dan Kesehatan*, 2010
82. Eom, KS, Kim, JH, Yoon SH, Lee SJ, Gender difference in adult traumatic brain injury according to the Glasgow coma Scale. *Chin J Traumatol*, 2021 Nov; 24(6): 333–343. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8606602/>
83. Tandean Steven, Japardi Jeffrey, *Epidemiology of Traumatic Brain Injury in Neurosurgery Department of Tertiary Referral Hospital at North Sumatera, Indonesia*. 2019
84. Czyzewski Wojciech, Litak Jakub. Aquaporins : Gatekeepers of Fluid Dynamics in Traumatic Brain Injury. *International Journal of Molecular Science*, 2024
85. Lafta Ghazwan, Sbahi Hayder. Factors associated with severity of traumatic brain injury. *Med Pharm Rep*. 2023. PMID 36818327

86. Braun Molly, Sevaio Mathew. Macroscopic changes in aquaporin-4 underlie blast traumatic brain injury-related impairment in glymphatic function. *Brain*. 2024
87. World Health Organization. Regional Office for Europe. (2020). Violence and injuries in Europe: burden, prevention and priorities for action. World Health Organization. Regional Office for Europe. <https://iris.who.int/handle/10665/332919>. License: CC BY-NC-SA 3.0 IGO
88. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control . Injuries and violence are leading causes of death.2024 Aug 14
89. Ruchira M. Jga, Patrick M. Kochanek, J. Marc Simarc. Pathophysiology and Treatment of Cerebral Edema in Traumatic Brain Injury. *Nueropharmacology*. 2019 Feb; 145(Pt B): 230–246. PMID: 30086289
90. Ruth. Jean Tri, Sabri, Delyuzar. Correlation Between Epidural Hematoma Volume In Temporal Region With Glasgow Coma Scale On Patients With Head Injury At Haji Adam Malik General Hospital Medan In The Year of 2018. *AANHS Journal*. 2020, Vol 02, No. 1
91. Yingfeng Wan, Katherine G Holste, Ya Hua, Richard F.Keep. Brain Edema formation and therapy after intracerebral hemorrhage. *Neurobiol Dis*. 2022 Dec 5
92. Liang Xian, Long Lin, Sang Chen, Li Chen. Microcirculatory disturbance : A new mechanism of brain swelling after traumatic brain injury. Elsevier. 2024 April 11.
93. Daniel P, Whitehouse, Miguel Monteiro, Endre Czeiter. Relationship of admission blood proteomic biomarkers levels to lesion type and lesion burden in traumatic brain injury : A center-TBI study, *eBioMedicine*.2022;75:103777
94. Margherita N, Alessandro Frati. Immunohistochemical Evaluation of Aquaporin-4 and its Correlation with CD68, IBA-1, HIF-1, GFAP and CD15 Expression in Fatal Traumatic Brain Injury. *Int.J.Mol.Sci*.201, 19(11),3544.
95. Zador, Z.; Bloch, O.; Yao, X.; Manley, G.T. Aquaporins: Role in cerebral edema and brain water balance. *Prog. Brain Res*. **2007**, *161*, 185–194
96. Xiong, A.; Xiong, R.; Yu, J.; Liu, Y.; Liu, K.; Jin, G.; Xu, J.; Yan, J. Aquaporin-4 is a potential drug target for traumatic brain injury via aggravating the severity of brain edema. *Burns Trauma* **2021**, *9*, tkaa050.
97. Tang, G.; Yang, G.Y. Aquaporin-4: A Potential Therapeutic Target for Cerebral Edema. *Int. J. Mol. Sci*. **2016**, *17*, 1413.
98. Solar, P.; Hendrych, M.; Barak, M.; Valekova, H.; Hermanova, M.; Jancalek, R. Blood-Brain Barrier Alterations and Edema Formation in Different Brain Mass Lesions. *Front. Cell Neurosci*. **2022**, *16*, 922181
99. Cartagena, C.M.; Phillips, K.L.; Tortella, F.C.; Dave, J.R.; Schmid, K.E. Temporal alterations in aquaporin and transcription factor HIF1 α expression following penetrating ballistic-like brain injury (PBBi). *Mol. Cell Neurosci*. **2014**, *60*, 81–87
100. McGinn, M.J.; Povlishock, J.T. Pathophysiology of Traumatic Brain Injury. *Neurosurg. Clin. N. Am*. **2016**, *27*, 397–407.
101. Golding, E.M. Sequelae following traumatic brain injury. The cerebrovascular perspective. *Brain Res. Rev*. **2002**, *38*, 377–388.