



Ahmad AM. (2019) Moderate-intensity continuous training: is it as good as high-intensity interval training for glycemic control in type 2 diabetes? *J Exerc Rehabil.* Apr 26;15(2):327–33.

Allen RS, Hanif AM, Gogniat MA, Prall BC, Haider R, Aung MH, et al. (2018) TrkB signalling pathway mediates the protective effects of exercise in the diabetic rat retina. *Eur J Neurosci.* May;47(10):1254–65.

Barber, A. J., Lieth, E., Khin, S. A., Antonetti, D. A., Buchanan, A. G., & Gardner, T. W. (1998). Neural apoptosis in the retina during experimental and human diabetes. Early onset and effect of insulin. *The Journal of clinical investigation*, 102(4), 783-791.

Chernykh, V. V., Varvarinsky, E. V., Smirnov, E. V., Chernykh, D. V., & Trunov, A. N. (2015). Proliferative and inflammatory factors in the vitreous of patients with proliferative diabetic retinopathy. *Indian journal of ophthalmology*, 63(1), 33.

Colberg, S.R.; Sigal, R.J.; Yardley, J.E.; Riddell, M.C.; Dunstan, D.W.; Dempsey, P.C.; Horton, E.S.; Castorino, K.; Tate, D.F. (2016). Physical Activity/Exercise and Diabetes: A Position Statement of the American Diabetes Association. *Diabetes Care*, 39, 2065–2079.

Cunha-Vaz, J., Ribeiro, L., and Lobo, C. (2014). Phenotypes and biomarkers of diabetic retinopathy. *Prog. Retin. Eye Res.* 41, 90–111. doi: 10.1016/j.preteyes.2014.03.003

D. C. S. Huang and A. Strasser, (2000) “BH3 only proteins essential initiators of apoptotic cell death,” *Cell*, vol. 103, no. 6, pp. 839–842.,

Dharmastuti DP, Agni AN, Widyaputri F, Pawiroranu S, Sofro ZM, Wardhana FS, et al. (2018) Associations of Physical Activity and Sedentary Behaviour with Vision-Threatening Diabetic Retinopathy in Indonesian Population with Type 2 Diabetes Mellitus: Jogjakarta Eye Diabetic Study in the Community (JOGED.COM). *Ophthalmic Epidemiology*. Mar 4;25(2):113–9.

Fan L, Yan H. (2016). FTY720 attenuates retinal inflammation and protects blood-retinal barrier in diabetic rats. *Invest Ophthalmol Vis Sci.*;57:1254–1263. DOI:10.1167/iovs.15-18658.

Garber, C.E.; Blissmer, B.; Deschenes, M.R.; Franklin, B.A.; Lamonte, M.J.; Lee, I.M.; Nieman, D.C.; Swain, D.P.; (2011) American College of Sports Medicine. American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Med. Sci. Sports Exerc.*, 43, 1334–1359.

Garhöfer, G., Chua, J., Tan, B., Wong, D., Schmidl, D., & Schmetterer, L. (2020). Retinal neurovascular coupling in diabetes. *Journal of Clinical Medicine*, 9(9), 2829.



Hasnan, J., Yusof, M. I., Damitri, T. D., Faridah, A. R., Adenan, A. S., & Norbaini, T. H. (2010). Relationship between apoptotic markers (Bax and Bcl-2) and biochemical markers in type 2 diabetes mellitus. *Singapore medical journal*, 51(1), 50–55.

Hespel P, Vergauwen L, Vandenberghe K, Richter EA. (1995) Important role of insulin and flow in stimulating glucose uptake. *Diabetes* 44:210 –215.

Hiller, R., Sperduto, R. D., Podgor, M. J., Ferris, F. L. III., and Wilson, P. W. (1988). Diabetic retinopathy and cardiovascular disease in type II diabetics. The framingham heart study and the framingham eye study. *Am. J. Epidemiol.* 128, 402–409.

Huang, H., Gandhi, J. K., Zhong, X., Wei, Y., Gong, J., Duh, E. J., & Vinores, S. A. (2011). TNF α is required for late BRB breakdown in diabetic retinopathy, and its inhibition prevents leukostasis and protects vessels and neurons from apoptosis. *Investigative ophthalmology & visual science*, 52(3), 1336-1344.

Isenmann, S., Engel, S., Gillardon, F., & BaÈhr, M. (1999). Bax antisense oligonucleotides reduce axotomy-induced retinal ganglion cell death in vivo by reduction of Bax protein expression. *Cell Death & Differentiation*, 6(7), 673-682

J. B. Saaddine, A. A. Honeycutt, K. M. V. Narayan, X. Zhang, R. Klein, and J. P. Boyle, (2008). “Projection of diabetic retinopathy and other major eye diseases among people with diabetes mellitus: United States, 2005–2050,” *Archives of Ophthalmology*. Vol. 126, no. 12, pp. 1740–1747.

Jing G, Wang JJ, Zhang SX. (2012). ER Stress and Apoptosis: A New Mechanism for Retinal Cell Death. *Experimental Diabetes Research*.:1–11.

Kauffmann DJH, van Meurs JC, Mertens DAE, Peperkamp E, Master C, Gerritsen ME. (1994). Cytokines in Vitreous Humor: Interleukin-6 Is Elevated in Proliferative Vitreoretinopathy. *Investigative Ophthalmology*;35(3):7.

Kaviarasan, K., Jithu, M., Mulla, M. A., Sharma, T., Sivasankar, S., Das, U. N., et al. (2015). Low blood and vitreal BDNF, LXA4 and altered Th1/Th2 cytokine balance are potential risk factors for diabetic retinopathy. *Metab. Clin. Exp.* 64, 958–966. doi: 10.1016/j.metabol.2015.04.005

Kim D-Y, Jung S-Y, Kim C-J, Sung Y-H, Kim J-D. (2013) Treadmill exercise ameliorates apoptotic cell death in the retinas of diabetic rats. *Molecular Medicine Reports*. Jun;7(6):1745–50.

Klaassen, I., Noorden, C. J. F. V., and Schlingemann, R. O. (2013). Molecular basis of the inner blood-retinal barrier and its breakdown in diabetic macular edema and other pathological conditions. *Prog. Retin. Eye Res.* 34, 19–48. doi: 10.1016/j.preteyeres.2013.02.001



Ekspresi Biomarker mRNA IL-6, TNF-alfa, Bax dan IHC P53 pada Retina Tikus Jantan Model Dm Tipe II dengan Latihan Fisik HIIT (High Intensity Interval Training) dan MICT (Medium Intensity Continuous Training)

UNIVERSITAS
GADJAH MADA MUHAMMAD ILHAM AKBAR, dr. M. Bayu Sasongko, SpM (K), Ph.D., M.Epid.; Prof. Dr. dr. Agus Supartoto, Sp.M (K)
Mohamed, Q.; Gillies, M. C.; and Wong, T. Y. (2007). Management of diabetic retinopathy: a systematic review. *JAMA* 298, 902–916. doi: 10.1001/jama.298.8.902

Moley, K. H., Chi, M. Y., Knudson, C. M., Korsmeyer, S. J., & Mueckler, M. M. (1998). Hyperglycemia induces apoptosis in pre-implantation embryos through cell death effector pathways. *Nature medicine*, 4(12), 1421-1424

Mu J, Brozinick JT, Valladares O, Bucan M, Birnbaum MJ. (2001). A role of AMP-activated protein kinase in contraction- and hypoxia-regulated glucose transport in retina. *Mol Cell* 7:1085–1094.

N. N. Danial and S. J. Korsmeyer. (2004). “Cell death: critical control points,” *Cell*, vol. 116, no. 2, pp. 205–219.

Podesta, F., Romeo, G., Liu, W. H., Krajewski, S., Reed, J. C., Gerhardinger, C., & Lorenzi, M. (2000). Bax is increased in the retina of diabetic subjects and is associated with pericyte apoptosis in vivo and in vitro. *The American journal of pathology*, 156(3), 1025-1032.

Prior, S.J.; McKenzie, M.J.; Joseph, L.J.; Ivey, F.M.; Macko, R.F.; Hafer-Macko, C.E.; Ryan, A.S. Reduced retinal capillarization and glucose intolerance. *Microcirculation* 2009, 16, 203–212.

Robinson R, Youngblood H, Iyer H, et al. (2020). Diabetes induced alterations in murine vitreous proteome are mitigated by IL-6 trans-signaling inhibition. *Invest Ophthalmol Vis Sci.*; 61(11):2. <https://doi.org/10.1167/iovs.61.11.2>

Sasongko MB, Widyaputri F, Agni AN, Wardhana FS, Kotha S, Gupta P, et al. (2017) Prevalence of Diabetic Retinopathy and Blindness in Indonesian Adults With Type 2 Diabetes. *American Journal of Ophthalmology*. Sep;181:79–87.

Scuderi, S., D'amico, A. G., Federico, C., Saccone, S., Magro, G., Bucolo, C., et al. (2015). Different retinal expression patterns of IL-1 α , IL-1 β , and their receptors in a rat model of type 1 STZ-induced diabetes. *J. Mol. Neurosci.* 56, 431–439. doi: 10.1007/s12031-015-0505-x.

Sharma, R. K., Rogojina, A. T., & Chalam, K. V. (2009). Multiplex immunoassay analysis of biomarkers in clinically accessible quantities of human aqueous humor. *Molecular vision*, 15, 60.

Sluik, D.; Buijsse, B.; Muckelbauer, R.; Kaaks, R.; Teucher, B.; Johnsen, N.F.; Tjonneland, A.; Overvad, K.; Ostergaard, J.N.; Amiano, P.; et al. (2017) Physical Activity and Mortality in Individuals With Diabetes Mellitus: A Prospective Study and Meta-analysis. *Arch. Intern. Med.* 2012, 172, 1285–1295.

Stem, M. S., and Gardner, T. W. (2013). Neurodegeneration in the pathogenesis of diabetic retinopathy: molecular mechanisms and therapeutic implications. *Curr. Med. Chem.* 20, 3241–3250. doi: 10.2174/09298673113209990027



Ekspresi Biomarker mRNA IL-6, TNF-alfa, Bax dan IHC P53 pada Retina Tikus Jantan Model Dm Tipe II dengan Latihan Fisik HIIT (High Intensity Interval Training) dan MICT (Medium Intensity Continuous Training)

UNIVERSITAS MUHAMMAD ILHAM AKBAR, dr. M. Bayu Sasongko, SpM (K), Ph.D., M.Epid.; Prof. Dr. dr. Agus Supartoto, Sp.M (K)
GADJAH MADA Tanaka, S. I., Seino, H., Saitoh, Y., Tuchi, N., Rikitake, H., Zhu, X. P., ... & Toyota, T. (1992).

Increased in vivo production of tumor necrosis factor after development of diabetes in nontreated, long-term diabetic BB rats. *Clinical immunology and immunopathology*, 62(3), 258-263

Universitas Gadjah Mada | Dinduh dari http://ejournalrepository.ugm.ac.id/