

DAFTAR PUSTAKA

- Aires MB. 2015. Effects of maternal diabetes on trophoblast cells. *World J. Diabetes*, 6(2): 338–344.
- Allaire AD, Ballenger KA, Wells SR, McMahon MJ, Lessey BA. 2000. Placental apoptosis in preeclampsia. *Obstet. Gynecol.*, 96(2): 271–276.
- Aouache R, Biquard L, Vaiman D, Miralles F. 2018. Oxidative stress in preeclampsia and placental diseases. *Int. J. Mol. Sci.*, 19(5): 1496.
- Ariyana M, Hadiati DR, Rachman IT, Dewajani Purnomosari. 2021. BAX expression of trophoblast cells did not differ between early and late-onset preeclampsia. *Indones. J. Obstet. Gynecol.*, 9(3): 126–129.
- Ashraf UM, Hall DL, Rawls AZ, Alexander BT. 2021. Epigenetic processes during preeclampsia and effects on fetal development and chronic health. *Clin. Sci.*, 135(19): 2307–2327.
- Aziz A, Mose JC. 2016. The Differences of Characteristic, Management, Maternal and Perinatal Outcomes among Early and Late Onset Preeclampsia. *OALib*, 03(06): 1–7.
- Balkundi DR, Ziegler JA, Watchko JF, Craven C, Trucco M. 2003. Regulation of FasL/Fas in human trophoblasts: Possible implications for chorioamnionitis. *Biol. Reprod.*, 69(2): 718–724.
- Bhadarka N, Nath Mukherjee T. 2016. Risk Factors of Early and Late Onset Preeclampsia in Population Admitted At Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India. *Int. J. Curr. Res. Life Sci.*, 05(03): 569–572.
- Brown MA, Magee LA, Kenny LC, Karumanchi SA, McCarthy FP, Saito S, *et al.* 2018. The hypertensive disorders of pregnancy: ISSHP classification, diagnosis & management recommendations for international practice. *Pregnancy Hypertens.*, 13(May): 291–310.
- Can M, Guven B, Bektas S, Arikan I. 2014. Oxidative stress and apoptosis in preeclampsia. *Tissue Cell*, 46(6): 477–481.
- Dahlan MS. 2010. *Buku Besar Sampel Dan Cara Pengambilan Sampel Dalam Penelitian Kedokteran Dan Kesehatan, Edisi 3*. Jakarta: Penerbit Salemba Medika.
- Ding GC, Chen M, Wang YX, Rui C, Xu W, Ding HJ, *et al.* 2016. MicroRNA-128a-induced apoptosis in HTR-8/SVneo trophoblast cells contributes to preeclampsia. *Biomed. Pharmacother.*, 81: 63–70.
- Elmore S. 2007. Apoptosis: A Review of Programmed Cell Death. *Toxicol. Pathol.*, 35(4): 495–516.
- De Falco M, De Luca L, Acanfora F, Cavallotti I, Cottone G, Laforgia V, *et al.* 2001. Alteration of the BCL2:BAX ratio in the placenta as pregnancy proceeds. *Histochem. J.*, 33(7): 421–5.
- Gathiram P, Moodley J. 2016. Pre-eclampsia: Its pathogenesis and pathophysiology. *Cardiovasc. J. Afr.*, 27(2): 71–78.
- Giantari I. 2019. Perbandingan ekspresi protein BCL-XL pada sel trofoblas antara preeklamsia awitan dini dengan preeklamsia awitan lambat [Tesis].

Yogyakarta: Universitas Gadjah Mada.

- Gomathy, Akurati L, Radhika K. 2018. Early onset and late onset preeclampsia-maternal and perinatal outcomes in a rural tertiary health center. *Int. J. Reprod. Contraception, Obstet. Gynecol.*, 7(6): 2266.
- Guo M, Zhao X, Yuan X, Li P. 2017. Elevated microRNA-34a contributes to trophoblast cell apoptosis in preeclampsia by targeting BCL2. *J. Hum. Hypertens.*, 31(12): 815–820.
- Hadiati DR. 2017. Perbedaan ekspresi protein BCL2 Family sebagai regulator aktivitas caspase trofoblas pada kehamilan dengan preeklamsia dibandingkan dengan kehamilan normotensi [Disertasi]. Yogyakarta: Universitas Gadjah Mada.
- Hadiati DR, Palupi A, Hakimi M, Haryana SM. 2018. Comparison of BCL-XL protein expression in placental trophoblast cells between pregnancy complicated by severe preeclampsia and normotensive pregnancy. *J. the Med. Sci. (Berkala Ilmu Kedokteran)*, 50(01): 33–41.
- Harapan H, Andalas M. 2015. The role of microRNAs in the proliferation, differentiation, invasion, and apoptosis of trophoblasts during the occurrence of preeclampsia-A systematic review. *Tzu Chi Med. J.*, 27(2): 54–64.
- Hasnan J, Yusof MI, Damitri TD, Faridah AR, Adenan AS, Norbaini TH. 2010. Relationship between apoptotic markers (BAX and BCL2) and biochemical markers in type 2 diabetes mellitus. *Singapore Med. J.*, 51(1): 50–55.
- Hayder H, O'Brien J, Nadeem U, Peng C. 2018. MicroRNAs: crucial regulators of placental development. *Reproduction*, 155(6): R259–R271.
- Higgins L, Mills TA, Greenwood SL, Cowley EJ, Sibley CP, Jones RL. 2013. Maternal obesity and its effect on placental cell turnover. *J. Matern. Neonatal Med.*, 26(8): 783–788.
- Holland OJ, Cuffe JSM, Dekker Nitert M, Callaway L, Kwan Cheung KA, Radenkovic F, *et al.* 2018. Placental mitochondrial adaptations in preeclampsia associated with progression to term delivery. *Cell Death Dis.*, 9(12): 1150.
- Hooker DJ, Mobarok M, Anderson JL, Rajasuriar R, Gray LR, Ellett AM, *et al.* 2012. A new way of measuring apoptosis by absolute quantitation of inter-nucleosomally fragmented genomic DNA. *Nucleic Acids Res.*, 40(15): e113.
- Hu R, Zhou S, Li X. 2006. Altered BCL2 and BAX expression is associated with cultured first-trimester human cytotrophoblasts apoptosis induced by hypoxia. *Life Sci.*, 79(4): 351–355.
- Hu X-Q, Zhang L. 2021. Hypoxia and the integrated stress response promote pulmonary hypertension and preeclampsia: implications in drug development. *Drug Discov. Today*, 26(11): 2754–2773.
- Hu XQ, Zhang L. 2021. Hypoxia and mitochondrial dysfunction in pregnancy complications. *Antioxidants*, 10(3): 1–27.
- Hung T-H, Chen S-F, Liou J-D, Hsu J-J, Li M-J, Yeh Y-L, *et al.* 2008. BAX, BAK, and mitochondrial oxidants are involved in hypoxia-reoxygenation-induced apoptosis in human placenta. *Placenta*, 29(7): 565–583.
- Hung TH, Huang SY, Chen SF, Wu CP, Hsieh TT an. 2020. Decreased placental

- apoptosis and autophagy in pregnancies complicated by gestational diabetes with large-for-gestational age fetuses. *Placenta*, 90(May 2019): 27–36.
- Iacobelli S, Bonsante F, Robillard PY. 2017. Comparison of risk factors and perinatal outcomes in early onset and late onset preeclampsia: a cohort based study in Reunion Island. *J. Reprod. Immunol.*, 123: 12–16.
- Kasture V, Kale A, Randhir K, Sundrani D, Joshi S. 2019. Effect of maternal omega-3 fatty acids and vitamin E supplementation on placental apoptotic markers in rat model of early and late-onset preeclampsia. *Life Sci.*, 239: 11703.
- Kasture V, Sundrani D, Randhir K, Wagh G, Joshi S. 2021. Placental apoptotic markers are associated with placental morphometry. *Placenta*, 115(March): 1–11.
- Kasture V V., Sundrani DP, Joshi SR. 2018. Maternal one carbon metabolism through increased oxidative stress and disturbed angiogenesis can influence placental apoptosis in preeclampsia. *Life Sci.*, 206(May): 61–69.
- Keman K, Prasetyorini N, Langgar MJ. 2009. Perbandingan ekspresi p53, Bcl-2, dan indeks apoptosis trofoblas pada preeklamsia/eklamsia dan kehamilan normal. *Indones. J. Obstet. Gynecol.*, 33(3): 151–159.
- Korshunova A, Blagonravov M, Neborak E, Syatkin S, Sklifasovskaya A, Semyatov S, *et al.* 2020. BCL2-regulated apoptotic process in myocardial ischemia-reperfusion injury (Review). *Int. J. Mol. Med.*, 47(1): 23–36.
- Kovács P, Joó JG, Tamás V, Molnár Z, Burik-Hajas D, Bódis J, *et al.* 2020. The role of apoptosis in the complex pathogenesis of the most common obstetrics and gynaecology diseases. *Physiol. Int.*, 107(1): 106–119.
- Leslie K, Whitley GSJ, Herse F, Dechend R, Ashton S V., Laing K, *et al.* 2015. Increased Apoptosis, Altered Oxygen Signaling, and Antioxidant Defenses in First-Trimester Pregnancies with High-Resistance Uterine Artery Blood Flow. *Am. J. Pathol.*, 185(10): 2731–2741.
- Li H, Ge Q, Guo L, Lu Z. 2013. Maternal plasma miRNAs expression in preeclamptic pregnancies. *Biomed Res. Int.*, 2013: 1–9.
- Li P, Guo W, Du L, Zhao J, Wang Y, Liu L, *et al.* 2013. microRNA-29b contributes to preeclampsia through its effects on apoptosis, invasion, and angiogenesis of trophoblast cells. *Clin. Sci.*, 124(1): 27–40.
- Lim JJ, Lee J Il, Kim DH, Song SH, Kim HJ, Lee WS, *et al.* 2013. DNA fragmentation of human sperm can be detected by ligation-mediated real-time polymerase chain reaction. *Fertil. Steril.*, 100(6): 1564-1571.e5.
- Lin L, Huai J, Su R, Wang C, Li B, Yang H. 2021. Incidence and clinical risk factors for preeclampsia and its subtypes: A population-based study in beijing, china. *Matern. Med.*, 3(2): 91–99.
- Lisonkova S, Joseph KS. 2013. Incidence of preeclampsia: Risk factors and outcomes associated with early-versus late-onset disease. *Am. J. Obstet. Gynecol.*, 209(6): 544.e1-544.e12.
- Liu N, Guo YN, Gong LK, Wang BS. 2021. Advances in biomarker development and potential application for preeclampsia based on pathogenesis. *Eur. J. Obstet. Gynecol. Reprod. Biol.* X, 9: 100119.
- Livak KJ, Schmittgen TD. 2001. Analysis of relative gene expression data using

- real-time quantitative PCR and the $2^{-\Delta\Delta CT}$ method. *Methods*, 25(4): 402–408.
- Madazli R, Yuksel MA, Imamoglu M, Tuten A, Oncul M, Aydin B, *et al.* 2014. Comparison of clinical and perinatal outcomes in early- and late-onset preeclampsia. *Arch. Gynecol. Obstet.*, 290(1): 53–57.
- Marín R, Chiarello DI, Abad C, Rojas D, Toledo F, Sobrevia L. 2020. Oxidative stress and mitochondrial dysfunction in early-onset and late-onset preeclampsia. *Biochim. Biophys. Acta - Mol. Basis Dis.*, 1866: 165961.
- Matalová E, Španová A. 2002. Detection of Apoptotic DNA Ladder in Pig Leukocytes and its Precision Using LM-PCR (Ligation Mediated Polymerase Chain Reaction). *Acta Vet. Brno*, 71(2): 163–168.
- Mohammadpour-Gharehbagh A, jahantigh D, Eskandari M, Sadegh MH, Nematollahi MH, Rezaei M, *et al.* 2019. Genetic and epigenetic analysis of the BAX and BCL2 in the placenta of pregnant women complicated by preeclampsia. *Apoptosis*, 24(3–4): 301–311.
- Morillas P, de Andrade H, Castillo J, Quiles J, Bertomeu-González V, Cordero A, *et al.* 2012. Inflammation and Apoptosis in Hypertension. Relevance of the Extent of Target Organ Damage. *Rev. Española Cardiol. (English Ed.)*, 65(9): 819–825.
- Naicker T, Dorsamy E, Ramsuran D, Burton GJ, Moodley J. 2013. The role of apoptosis on trophoblast cell invasion in the placental bed of normotensive and preeclamptic pregnancies. *Hypertens. Pregnancy*, 32(3): 245–256.
- Nour H, Zahran N, Elhamid SA, Zahran M, Raafat M, Saeed A El. 2016. The role of BCL-2 and BAK genes in chronic kidney disease and haemodialysis patients. Galuska SP, editor.[editorial]. *J. Glycomics Metab.*, 1(1): 8–24.
- Putra DMS. 2019. Perbandingan ekspresi protein P53 sel trofoblas antara preeklamsia awitan dini dengan preeklamsia awitan lanjut [Tesis]. Yogyakarta: Universitas Gadjah Mada.
- Quinn KH, Lacoursiere DY, Cui L, Bui J, Parast MM. 2011. The unique pathophysiology of early-onset severe preeclampsia: role of decidual T regulatory cells. *J. Reprod. Immunol.*, 91: 76–82.
- Raguema N, Moustadraf S, Bertagnolli M. 2020. Immune and Apoptosis Mechanisms Regulating Placental Development and Vascularization in Preeclampsia. *Front. Physiol.*, 11(February): 1–8.
- Ray J, Jurisicova A, Caniggia I. 2009. IFPA Trophoblast Research Award Lecture: the dynamic role of BCL2 family members in trophoblast cell fate. *Placenta*, 30(Suppl.): 96–100.
- Raymond D, Peterson E. 2011. A critical review of early-onset and late-onset preeclampsia. *Obstet. Gynecol. Surv.*, 66(8): 497–506.
- Redman C. 2014. The six stages of pre-eclampsia. *Pregnancy Hypertens. An Int. J. Women's Cardiovasc. Heal.*, 4(3): 246.
- Redman CWG, Sargent IL. 2001. The pathogenesis of preeclampsia. *Gynecol. Obstet. Fertil.*, 29(7–8): 518–522.
- Redman CWG, Sargent IL. 2009. Placental stress and pre-eclampsia: a revised view. *Placenta*, 30 Suppl A: S38–42.
- Redman CWG, Staff AC. 2015. Preeclampsia, biomarkers, syncytiotrophoblast

- stress, and placental capacity. *Am. J. Obstet. Gynecol.*, 213(4): S9.e1-S9.e4.
- Redman CWG, Staff AC, Roberts JM. 2021. Syncytiotrophoblast stress in preeclampsia: the convergence point for multiple pathways. *Am. J. Obstet. Gynecol.*; 1–21.
- Robillard P-Y, Boukerrou M, Dekker G, Scioscia M, Bonsante F, Boumahni B, *et al.* 2021. Risk Factors for Early and Late Onset Preeclampsia in Reunion Island: Multivariate Analysis of Singleton and Twin Pregnancies. A 20-Year Population-Based Cohort of 2120 Preeclampsia Cases. *Reprod. Med.*, 2(3): 131–143.
- Saito S, Sakai M, Sasaki Y, Nakashima A, Shiozaki A. 2008. Inadequate tolerance induction may induce pre-eclampsia. *J. Reprod. Immunol.*, 76: 30–39.
- Salakou S, Kardamakis D, Tsamandas AC, Zolota V, Apostolakis E, Tzelepi V, *et al.* 2007. Increased BAX/BCL2 ratio up-regulates caspase-3 and increases apoptosis in the thymus of patients with myasthenia gravis. *In Vivo*, 21(1): 123–32.
- Sari DJ, Tarawifa S, Suzan R. 2021. Perbandingan Ekspresi Gen Bcl 2 Pada Preeklamsia Ringan / Berat Dan Kehamilan Normal Di Kota Jambi. *J. Med. Stud.*, 1(1): 29–39.
- Sgarbosa F, Barbisan LF, Brasil MAM, Costa E, Calderon IMP, Gonçalves CR, *et al.* 2006. Changes in apoptosis and Bcl-2 expression in human hyperglycemic, term placental trophoblast. *Diabetes Res. Clin. Pract.*, 73(2): 143–149.
- Sharp AN, Heazell AEP, Crocker IP, Mor G. 2010. Placental apoptosis in health and disease. *Am. J. Reprod. Immunol.*, 64(3): 159–169.
- Sidhajati RA. 2022. Perbandingan ekspresi protein BAK sel trofoblas pada preeklamsia awitan dini dan awitan lambat [Tesis]. Yogyakarta: Universitas Gadjah Mada.
- Sohlberg S, Stephansson O, Cnattingius S, Wikström AK. 2012. Maternal body mass index, height, and risks of preeclampsia. *Am. J. Hypertens.*, 25(1): 120–125.
- Staff AC. 2019. The two-stage placental model of preeclampsia: an update. *J. Reprod. Immunol.*, 134–135: 1–10.
- Staley K, Blaschke AJ, Chun J. 1997. Apoptotic DNA fragmentation is detected by a semiquantitative ligation-mediated PCR of blunt DNA ends. *Cell Death Differ.*, 4(1): 66–75.
- Straszewski-Chavez SL, Abrahams VM, Mor G. 2005. The role of apoptosis in the regulation of trophoblast survival and differentiation during pregnancy. *Endocr. Rev.*, 26(7): 877–97.
- Sumawan H. 2019. Perbandingan ekspresi BCL2 (B-cell lymphoma 2) sel trofoblas plasenta antara preeklamsia awitan dini dan awitan lambat [Tesis]. Yogyakarta: Universitas Gadjah Mada.
- Tarca AL, Romero R, Benshalom-Tirosh N, Than NG, Gudicha DW, Done B, *et al.* 2019. The prediction of early preeclampsia: Results from a longitudinal proteomics study. Crispi F, editor.[editorial]. *PLoS One*, 14(6): e0217273.
- Teguh M, Karkata MK, Wirakusumah FF, Mose JC, Septiani L, Satari MH. 2014. Correlation between protein-with-molecular-weight-53 (P53), burkitt cell

- lymphoma 2 (BCL2), and fas ligand (FasL) and vascular-cell-adhesion-molecule-1 (VCAM-1) mRNA expression levels in a pathogenesis study of preeclampsia. *Int. J. Integr. Heal. Sci.*, 2(1): 23–9.
- Travaglini A, Raffone A, Saccone G, Migliorini S, Maruotti GM, Esposito G, *et al.* 2019. Placental morphology, apoptosis, angiogenesis and epithelial mechanisms in early-onset preeclampsia. *Eur. J. Obstet. Gynecol. Reprod. Biol.*, 234: 200–206.
- Vavina OV, Khodzhaeva ZS, Vyssokikh MY, Klimenchenko NI, Muminova KT, Tarasova NV, *et al.* 2016. Profound mitochondrial dysfunction leads to early onset preeclampsia. *Eur. J. Obstet. Gynecol. Reprod. Biol.*, 206: e118.
- Weitzner O, Yagur Y, Weissbach T, Man El G, Biron-Shental T. 2020. Preeclampsia: risk factors and neonatal outcomes associated with early-versus late-onset diseases. *J. Matern. Neonatal Med.*, 33(5): 780–784.
- Wiweko B, Muna N, Gunawarti DP, Nasution RU, Zesario A. 2017. High BAX-BCL-2 ratio expression on granulosa cells from endometriosis patients. *Adv. Sci. Lett.*, 23(7): 6720–6722.
- Yacobi S, Ornoy A, Blumenfeld Z, Miller RK. 2002. Effect of sera from women with systemic lupus erythematosus or antiphospholipid syndrome and recurrent abortions on human placental explants in culture. *Teratology*, 66(6): 300–308.
- Yamada Z, Kitagawa M, Takemura T, Hirokawa K. 2001. Effect of maternal age on incidences of apoptotic and proliferative cells in trophoblasts of full-term human placenta. *Mol. Hum. Reprod.*, 7(12): 1179–1185.
- Yan J, Dong J, Lin Xiaoqian, Chen L, Fang Z, Han Q, *et al.* 2021. Differential expression of markers of oxidative stress and apoptosis in relation to serum ferritin levels in patients with pre-eclampsia. *BioMedica*, 37(3): 1–8.
- Yuen RK, Peñaherrera MS, von Dadelszen P, McFadden DE, Robinson WP. 2010. DNA methylation profiling of human placentas reveals promoter hypomethylation of multiple genes in early-onset preeclampsia. *Eur. J. Hum. Genet.*, 18(9): 1006–12.
- Zhang Y, Liu X, Yang L, Zou L. 2020. Current Researches, Rationale, Plausibility, and Evidence Gaps on Metformin for the Management of Hypertensive Disorders of Pregnancy. *Front. Pharmacol.*, 11(December): 1–13.