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DAFTAR PUSTAKA

Adeney, K.L., Siscovick, D.S., Ix, J. H., Selinger, S.L., Shlipak, M.G., Jenny, N.S., *et al*., 2009. Association of serum phosphate with vascular and valvular calcification in moderate CKD. *J Am Soc Nephrol*. 20: 381-387.

Afiatin, Supriadi, R., Sarly, D., Rusanti, I., 2018. 11th Report Of Indonesian Renal Registry. *Indonesian Renal Registry*.

Akbar, M.Y.A., Ali, Z., Indrajaya, T., Suhaimi, N., Devi, R., Bahar, E., 2021. Hubungan antara kadar serum PTH dengan kalsifikasi aorta abdominal pada pasien hemodialisis kronik di RSUP Dr. Mohammad Hoesin Palembang. *Jurnal Penyakit Dalam Indonesia*, Vol. 8, No. 1.

Alam, M., Kirton, J.P., Wilkinson, F., Towers, E., Sinha, S., Rouhi, M., *et al*., 2009. Calcification is associated with loss of functional calcium-sensing receptor in vascular smooth muscle cells. *Cardiovascular Research*, 81, 260-268.

Barreto, F.C., Barreto, D.V., Massy, Z.A., Drüeke, T., 2019. Strategies for phosphate control in patients with CKD. *Kidney International Reports* (4), 1043-1056.

Beddhu, S., Kaysen, G.A., Yan, G., Sarnak, M., Agodoa, L., Ornt, D., Cheung, A.K., 2002. Association of serum albumin and atherosclerosis in chronic hemodialysis patients. *American Journal of Kidney Disease*, Vol 40, No 4 : 721-727.

Bellasi, A., Ferramosca, E., Muntner, P., Ratti, P., Wildman, R.P., Block, G.A., *et al*., 2006. Correlation of simple imaging tests and coronary artery calcium measured by computed tomography in hemodialysis patients. *Kidney Int.* 70: 1623-1628.

Biyik, Z., Selcuk, N.Y., Tonbul, H.Z., Anil, M., Uyar, M., 2016. Assesment of abdominal aortic calcification at different stages of chronic kidney disease. *Int Urol Nephrol*, DOI 10.1007/s11255-016-1413-x.

Blagg, C., 2001. Long-term complication in hemodialysis. *Saudi J Kidney Dis Transplant*, 12(4):487-493

Block, G.A., Port, F. K., 2003. Calcium phosphate metabolism and cardiovascular disease in patients with chronic kidney disease. *Seminar in Dialysis* Vol 16, No 2, 140-147.

Block, G.A., Klassen, P.S., Lazarus, M.J., Ofsthun, N., Lowrie, E.G., Chertow, G.M., 2004. Mineral metabolism, mortality, and morbidity in maintenance hemodialysis. *J Am Soc Nephrol*. 15: 2208-2218.

Chen, C., Zhang, J., Zhou, Z., Liu, J., Li, C., Liu, C., 2021. Impact of serum albumin level and variability on short-term cardiovascular-related and all-cause mortality in patients on maintenance hemodialysis. *Medicine*; 100:43.

Chen, N.X., Moe, S.M., 2012. Vascular calcification : pathophysiologi andi risk factors. *Curr Hypertens Rep*. 14(3): 228-237.

Cheng, J., Zhang, L., 2019. Prevalence and disease burden of chronic kidney disease. renal fibrosis : mechanisms and therapies. pp 3-15. DOI: 10.1007/978-981-13-8871-2_1.

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Collins, A.J., Foley, R.N., Gilbertson, D.T., Chen, S.C., 2015. United States renal data system public health surveillance of chronic kidney disease and end-stage renal disease. *Kidney Int*. 5, 2-7.

Cozzolino, M., Ciceri, P., Galassi, A., Mangano, M., Carugo, S., Capelli, I., *et al*., 2019. The key role of phosphate on vascular calcification. *Toxins* 11: 213.

Dahlan, S., 2016. Besar sampel dalam penelitian kedokteran dan kesehatan. Epidemiologi Indonesia, edisi 4. ISBN 978-602-18408-8-7.

Fitzgibbons, T., Hardy, O., Lessard, D., Gore, J., Yarzebski, J., Goldberg, R., 2009. Body mass index, treatment practices, and mortality in patients with acute heart failure. *Coron Artery Dis*, 20(8): 536-543

Giachelli, C.M. , 2009. The emerging role of phosphate in vascular calcification. *Kidney Int*. 75: 890-897.

Goldberg, I., Krause, I., 2016. The role of gender in chronic kidney disease. *European Medical Journal* (2):58-64.

Gonçalves, F.B., Voute, M.T, Hoeks, S.E., Chonchol, M.B., Boersma, E.E., Stolker, R.J., *et al.,* 2012. Calcification of the abdominal aorta as an independent predictor of cardiovascular events: a meta-analysis. *Heart* 98:988-994.

Goodman, W.G., Goldin, J.G., Kuizon, B., Yoon, C., Gales, B., Sider, D., Wang, Y., *et al*., 2000. Coronary-artery calcification in young adults with end-stage renal disease who are undergoing dialysis. *N Eng J Med*, 342:1478-83.

Grabner, A., Amaral, A.P., Schramm, K., Singh, S., Sloan, A., Yanucil, C., *et al*., 2015. Activation of cardiac fibroblast growth factor receptor 4 causes left ventricular hypertrophy. *Cell Metab.* 22(6): 1020-1032.

Graciolli, F.G., Neves, K.R., Reis, L.M., Graciolli, R.G., Noronha, I.L., Moyses, R.M., *et. al*., 2009. Posphorus overload and PTH induce aortic expression of RUNX2 in experimental uraemia. *Nephrol Dial Transplant* 24:1416-1421.

Honkanen, E.H., Kauppila, L., Rensma, P.L., Krzesinski, J.M., Aasarod, K., Jensen, P.B., *et al*., 2008. Abdominal aortic calcification in dialysis patients: results of the CORD study. *Nephrol Dial Transplant* 23: 4009-4015.

Hruska, K.A., Mathew, S., Lund, R., Qiu, P., Pratt, R., 2008. Hyperphosphatemia of chronic kidney disease. *Kidney Int.* 74(2): 148-157.

Huveneers, S., Daemen, M.J., Hordijk, P.L., 2015. Between rho(k) and a hard place the relations between vessel wall stiffness, endothelial contractility, and cardiovascular disease. *Circ Res*. 116: 895-908.

Inagaki, K., Tawada, N., Takanashi, M., Akahori, T., 2022. The association between body mass index and all-cause mortality in Japanese patients with incident hemodialysis. *Plos One*, https://doi.org/10.1371/journal.pone.0269849

Jialin, W., Yi, Z., Weijie, Y., 2012. Retaionship between body mass index and mortality in hemodialysis patients: a meta-analysis. *Nephron Clin Pract*, 121:c102-c111

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HUBUNGAN KADAR FOSFAT SERUM DAN DERAJAT KALSIFIKASI AORTA ABDOMINAL PADA PASIEN PENYAKIT GINJAL
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Jono, S., McKee, M.D., Murry, C.E., Shioi, A., Nishizawa, Y., Mori, K., *et al.* , 2000. Phosphate regulation of vascular smooth muscle cell calcification. *Circ Res*. 87:e10-e17.

Jung, J.G., Wu, L.T., Kim, J.S., Kim, E.D., Yoon, S.J., 2019. Relationship between smoking and abdominal aorta calcification on computed tomography. *Korean J Fam Med.* 40: 248-253.

Kauppila, L.I, Polak, J.F., Cupples, L.A., Hannan, M.T., Kiel, D.P., Wilson, P.W., 1997. New indices to classify location, severity and progression of calcific lesion in the abdominal aorta: a 25-year follow-up study. *Atherosclerosis* 132; 245-250.

KDIGO (*Kidney Disease Improving Global Outcome*), 2017. KDIGO 2017 clinical practice guideline update for the diagnosis, evaluation, prevention, and treatment of chronic kidney disease-mineral and bone disorder (CKD-MBD). *Kidney International Supplements* 7, 1-59.

Kestenbaum, B., Sampson, J.N, Rudser, K.D., Patterson, D.J., Selinger, S.L., Young, B., *et al*., 2005. Serum phosphate levels and mortality risk among people with chronic kidney disease. *J Am Soc Nephrol*. 16: 520-528.

Kuro-o, M., Matsumura, Y., Aizawa, H., Kawaguchi, H., Suga, T., Utsugi, T., *et al*., 1997. Mutation of the mouse *klotho* gene leads to a syndrome resembling ageing. *Nature* 390: 45-51.

Larsson, T., Olauson, H., Hgstrom, E., Ingelsson, E., Arnlov, J., Lind, L., Sundstrom, J., 2010. Conjoint effect of serum calcium and phosphate on risk of total, cardiovascular, and noncardiovascular mortality in the community. *Arterioscler Thromb Vasc Biol* 30: 333-339.

Lau, W.L., Festing, M.H., Giachelli, C.M., 2011. Phosphate and vascular calcification: emerging role of the sodium-dependent phosphate cotransporter Pit-1. *Thromb Haemost*. 104(3): 464-470.

Lehmann, N., Mohlenkamp, S., Mahabadi, A.A., Schermund, A., Roggenbuck, U., Seibel, R., *et al*., 2014. Effect of smoking and other traditional risk factors on the onset of coronary artery calcification: results of the Heinz Nixdorf recall study. *Atherosclerosi*s 232:339-45.

Lewis, J.B., Sika, M., Koury, M.J., Chuang, P., Schulman, G., Smith, M. T., *et al*., 2015. Ferric citrate controls phosphorus and delivers iron in patients on dialysis. *J Am Soc Nephrol*. 26: 493-503.

Li, X., Yang, H.Y., Giachelli, C.M., 2006. Role of the sodium phosphate cotransporter, Pit-1, in vascular smooth muscle cell calcification. *Circ Res*. 98: 905-912.

Liebman, S., Lamontgan, S., Huang, L., Mesing, S., Bushinsky, D., 2011. Smoking in dialysis patients: a systematic review and metaanalysis of mortality and cardiovascular morbidity. *Am J Kidney Dis*, 58(2): 257-265

London, G.M., Guerin, A. P., Marchais, S.J., Metivier, F., Pannier, B., Adda, H., *et al*., 2003. Arterial media calcification in end-stage renal disease: impact on all-cause and cardiovascular mortality. *Nephrol Dial Transplant*. 18: 1731-1740.

UNIVERSITAS GADJAH MADA
HUBUNGAN KADAR FOSFAT SERUM DAN DERAJAT KALSIFIKASI AORTA ABDOMINAL PADA PASIEN PENYAKIT GINJAL
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Massy, Z.A., Ivanovski, O., Nguyen-Khoa, T., Angulo, J., Szumilak, D., Mothu, N., *et.al*., 2005. Uremia accelerates both atherosclerosis and arterial calcification in apolipoprotein e knockout mice. *J Am Soc* Nephrol. 16: 109-116.

Mehrotra, R., Budoff, M., Christenson, P., Ipp, E., Takasu, J., Gupta, A., Norris, K., *et al*., 2004. Determinants of coronary artery calcification in diabetics with and without nephropathy. *Kidney international*, Vol 66 pp. 2022-2031.

Moe, S., O'Neill, K., Fineberg, N., Persohn, S., Ahmed, S., Garret, P., Meyer, C., 2003. Assesment of vascular calcification in ESRD patients using spiral CT. *Nephrol Dial Transplant*, 18: 1152-1158.

Moens, S.J.B., Verweij, S.L., Stroes, E.S. G., 2017. Arterial and cellular inflammation in patients with CKD. *J Am Soc Nephrol*. 28(4): 1278-1285.

Mozar, A., Haren, N., Chasseraud, M., Louvet, L., Maziere, C., Wattel, A., *et al*. , 2008. High extracellular inorganic phosphate concentration inhibits rank-rankl signaling in osteoclast-like cells. *J. Cell. Physiol*. 215: 47-54.

Nasrallah, M.N., El-Shehaby, A.R., Salem, M., Osman, N.A., Sheikh, E.E., El Din, U.A.S., 2010. Fibroblast growth factor-23 (FGF-23) is independently correlated to aortic calcification in haemodialysis patients. *Nephrol Dial Transplant*, 25: 2679-2685.

Oliveira, F., Bonato, B., Karohl, C., Eugenia, M., Canziani, F., 2021. Diagnosis of vascular calcification related to mineral and bone metabolism disorders in chronic kidney disease. *J. Bras. Nephrol*., 43(4 Suppl. 1):628-631.

O'Sullivan, E., Hughes, J., Ferenbach, D., 2017. Renal aging: causes and consequences. *J Am Soc Nephrol* 28: 407-420.

Onufrak, S., Bellasi, A., Shaw, L.J., Herzog, C.A., Cardarelli, F., Wilson, P., *et al*., 2008. Phosphorus levels are associated with subclinical atherosclerosis in the general population. *Atherosclerosis,* 199: 424-431.

Ozkok, A., Kekik, C., Karahan, G.E., Sakaci, T., Ozel, A., Unsal, A., Yildiz, A., 2013. FGF-23 associated with the progression of coronary artery calcification in hemodialysis patients. *BMC Nephrology*, 14:241.

Palit, S., Kendrick, J., 2014. Vascular calcification in chronic kidney disease: role of disordered mineral metabolism. *Curr Pharm*. 20(37): 5829-5833.

Pateinakis, P., Papagianni, A., 2013. Fibroblast growth factor-23 and adverse clinical outcomes in chronic kidney disease patients. *OA Nephrology*. 1(1):4.

Peeters, M.J., Van Den Brand, J., Van Zuilen, A., Koster Y., Bots M., Vervloet M., *et al*., 2015. Abdominal aortic calcification in patients with CKD. *J Nephrol*. DOI 10.1007/s40620-015-0260-7.

Proudfoot, D., Skepper, J.N., Hegyi, L., Farzaneh-Far, A., Shanahan, C.M., Weissberg, P.L. , 2001. The role of apoptosis in the initiation of vascular calcification. *Kardiol.* 90 Suppl 3: 43–46.

Raggi, P., Boulay, A., Chasan-Taber, S., Amin, N., Dillon, M, Burke, S., *et al*., 2002. Cardiac calcification in adult hemodialysis patients. *JACC* Vol 39 No 4, 695-701

UNIVERSITAS GADJAH MADA
HUBUNGAN KADAR FOSFAT SERUM DAN DERAJAT KALSIFIKASI AORTA ABDOMINAL PADA PASIEN PENYAKIT GINJAL
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Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Scialla, J., Wolf, M., 2014. Roles of phosphate and fibroblast growth factor 23 in cardiovascular disease. *Nat Rev Nephrol*. 10(5):268-78.

Shanahan, M.C., Crouthamel, H.M., Kapustin, A., Giachelli, C.M., 2011. Arterial calcification in chronic kidney disease: key roles for calcium and phosphate. *Circ Res*. 109(6): 697-711.

Shigematsu, T., Kono, T., Satoh, K., Yokoyama, K., Yoshida, T., Hosoya, T., *et al*., 2003. Phosphate overload accelerates vascular calcium deposition in end-stage renal disease patients. *Nephrol Dial Transplant*, 18 (suppl 3): iii86-iii89

Skorecki, K., Chertow, G., Marsden, P., 2016. *Brenner and Rector's The Kidney*. 10th ed Philadelphia, PA: Elsevier; ISBN: 9780323680776.

Stubbs, J., Liu, S., Quarles, L.D., 2007. Phosphorus metabolism and management in chronic kidney disease: role of firoblast growth factor 23 in phosphate homeostasis and pathogenesis of disordered mineral metabolism in chronic kidney disease. *Semin dial*. 20(4): 302-308.

Suwitra, K., Lydia, A., Susalit, E., Suhardjono, Yogiantoro, Prodjosudjadi, W., *et al*., 2009. Konsensus gangguan mineral dan tulang pada penyakit ginjal kronik (GMT-PGK). *PERNEFRI (Perhimpunan Nefrologi Indonesia)*. Edisi I cetakan I, Jakarta, ISBN 978-979-8303-08-4.

Takeda, E., Taketani, Y., Morita, K., Miyamoto, K.I., 1999. Sodium-dependent phosphate co-transporters. *The International Journal of Biochemistry & Cell Biology* 31: 377-381.

Takeda, E., Taketani, Y., Sawada, N., Sato, T., Yamamoto, H., 2004. The regulation and function of phosphate in the human body. *BioFactors* 21:345-355.

Tentori, F., Blayney, M., Albert, J., Gillespie, B., Kerr, P., Bommer, J., et al., 2008. Mortality risk for dialysis patients with different levels of serum calcium, phosporus, and PTH: The Dialysis Outcomes and Practice Patterns Study (DOPPS). *American Journal of Kidney Disease* Vol 52, No 3:519-530.

Toussaint, N., Lau, K., Strauss, B., Polkinghorne, K., Kerr, P., 2009. Relationship between vascular calcification, arterial stiffness and bone mineral density in a cross-sectional study of prevalent Australian haemodialysis patiets. *Nephrology* 14, 105-112.

Toussaint, N., Pedagogos, E., Lau, K., Heinze, S., Becker, G., Beavis, J., *et al*., 2011. Lateral lumbar x-ray assessment of abdominal aortic calcification in Australian haemodialysis patients. *Nephrology*, 16:389-395.

Tzanakis, I., Stamataki, E., Papadaki, A., Giannakis, N., Damianakis, N.E., Oreopoulos, D.G., 2014. Magnesium retards the progress of the arterial calcifications in hemodialysis patients: a pilot study. *International Urology and Nephrology* 46: 2199-2205.

Vervloet, M., Cozzolino, M., 2017. Vascular calcification in chronic kidney disease: different bricks in the wall? *Kidney Int.* 91: 808-817.

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Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Viera, A., Garret J., 2005. Understanding interobserver agreement: the Kappa statistic. *Fam Med.* 37(5):360-3.

Waziri, B., Duarte, R., Naicker, S., 2019. Chronic kidney disease-mineral and bone disorder (CKD-MBD): current perspectives. *International Journal of Nephrology and Renovascular Disease*. 12, 263-276.

Wilson, P., Kauppila, L., O'Donnell, C/. Kiel, D., Hannan, M., Polak, J., Cupples, A., 2001. Abdominal aortic calcific deposits are an important predictor of vascular morbidity and mortality. *Circulation,* 103:1529-1534

Wolf, M., 2012. Update on fibroblast growth factor 23 in chronic kidney disease. *Kidney International* 82, 737-747.

Yamada, K., Fujimoto, S., Nishiura, R., Komatsu, H., Tatsumoto, M., Sato, Y., et al., 2007. Risk factors of the progression of abdominal aortic calcification in patientas on chronic haemodialysis. *Nephrol Dial Transplant* 22: 2032-2037.

Yamada, S., Giachelli, M. C., 2016. Vascular Calcification in CKD-MBD: Roles for Phosphate, FGF23, and Klotho. *Bone* (16)30345-3.

Yu, M.K., Lyles, C.R., Bent-Shaw, L.A., Young, B. A., *et al*., 2012. Risk factor, age, and sex differences in chronic kidney disease prevalence in a diabetic cohort: The Pathways Study. Am J Nephrol 36(3): 245-251.

Zadeh, K., Abbot, K., Salahudeen, A., Kilpatrick, R., Horwich, T., 2005. Survival advantages of obesity in dialysis patients. *Am J Clin Nutr*, 81: 543-54

Zadeh, K., Kuwae, N., Regidor, D.L., Kovesdy, C.P., Kilpatrick, R.D., Shinaberger, C.S., *et al*., 2006. Survival predictability of time-varying indicators of bone disease in maintenance hemodialysis patients. *Kidney International* 70, 771-780.

Zhang, C., Wen, J., Fan, J., 2013. Efficacy and safety of lanthanum carbonate on chronic kidney disease-mineral and bone disorder in dialysis patients: a systematic review. *BMC Nephrology* 14: 22.

Zhang, W., Ye, G., Bi, Z., Chen, W., Qian, J., Zhang, M., *et al.,* 2021. Higher one-year achievement rate of serum phosphate associated with lower cardiovascular mortality in hemodialysis patients. *BMC Nephrology* 22:39.