

BAB VII

PENUTUP

7.1 RINGKASAN

- a. Kadar vitamin D paling rendah pada frekuensi eksaserbasi yang sering
- b. Kadar IL-8 paling tinggi pada frekuensi eksaserbasi yang sering
- c. Rerata kadar vitamin D pada pasien eksaserbasi adalah $21,82 \pm 21,11$.
- d. Rerata kadar IL-8 serum pada PPOK eksaserbasi adalah $187,5 \pm 68,8$.
- e. Dari hasil pemeriksaan kadar vitamin D pada pasien PPOK eksaserbasi didapatkan defisiensi (76,9%), sufisiensi (15,4%), insufisiensi (6,2%), dan toxic (1,5%).

7.2 KESIMPULAN

Kadar vitamin D didapatkan lebih rendah dan kadar IL-8 didapatkan lebih tinggi pada PPOK dengan frekuensi eksaserbasi yang sering ≥ 3 kali/tahun, dibandingkan dengan frekuensi eksaserbasi jarang < 3 kali/tahun.

7.3 SARAN

- a. Dibutuhkan penelitian mengenai efek suplementasi Vitamin D terhadap frekuensi eksaserbasi pada PPOK
- b. Perlu dilakukan penelitian mengenai gambaran kadar vitamin D dan konsentrasi IL-8 pada pasien PPOK dengan skala yang lebih besar.

DAFTAR PUSTAKA

1. Zhu M, Wang T, Wang C et al. The association between vitamin D and COPD risk, severity, and exacerbation: an Updated systematic review and meta-analysis. *Int J Chron Obstruct Pulmon Dis* 2016;11:2597-2607
2. Skaaby T, Husemoen LLN, Thuesen BH et al. Vitamin D status and chronic Obstructive Pulmonary Disease : A Prospective General Population Study. *PLOS ONE*. 2014 March; 9;3
3. Zhang J, Bai C, The Significance of Serum Interleukin-8 in Acute Exacerbation of Chronic Obstructive Pulmonary Disease. *NRITLD*. 2018;17:13-21
4. Janssens W, Bouillon R, Clas B et al. Vitamin D deficiency is highly prevalent in COPD and correlates with variants in the vitamin D-binding gene. *Thorax*. 2010; 65: 215-220.
5. Rasmin M, Jusuf A, Taufik et al. Dalam : *Buku Ajar Pulmonologi dan Kedokteran Respirasi Buku 1* ; 22-565. Jakarta : UI Pres. 2017
6. Holick MF. Vitamin D Status : Measurement, Interpretation and Clinical Application. *Ann Epidemiol*. 2009 February ; 19(2): 73–78.
7. Ferrari R, Caram LMO, Tanni SE et al. The relationship between Vitamin D and exacerbation in COPD patient; a literature review. *J.rmed*. 2018; 04:12
8. Carson EL, Pourshahidi LK, Madigan SM et al. Vitamin D status is associated with muscle strength and quality of life patients with COPD : a seasonal

- prospective observation study. *Int J Chorn Obstruct Pulmon Dis* ;2018;13:2613-262.
9. Soeroto AY, Suryadinata H. Penyakit Paru Obstruktif Kronik. *Ina J chest Crit and Emerg Med.*2014;1(2): 84-88.
10. NICE Guideline. Chronic obstructive pulmonary disease in over 16s : diagnosis and management.*NICE.*2018: 1-69.
11. Chick DA, Grand PJ, Harrison RV, et. al. Chronic Obstructive Pulmonary Disease. *UMHS COPD Guideline.*2017 : 1- 28.
12. Vollmer WM. Epidemiology of COPD : overview and the US perspective. *Eur Respir J.*2003; 22 (43) : 1-44.
13. Hadfield R, Hess M. Pocket Guide to COPD Diagnosis, Management, and Prevention. *GOLD.* 2019 : 1-44.
14. Nagai A, Aizawa H, Aoshiba K, et.al. Guideline for the Diagnosis and Treatment of COPD. *The Japanese Respiratory Society.*2010 : 1-29.
15. McCurdy BR, Bornstein M, Franek J, et.al. Chronic Obstructive Pulmonary Disease (COPD). *Ont Healt Technol Assess Ser.*2012; 12 (2) : 1- 97.
16. American Lung Association. Trends in COPD (Chronic Bronchitis and Emphysema : Morbidity and Mortality. *Am. Lung Assoc.*2013; 1-18.
17. Dewi YP. An Overview : Vitamin D. *www. Researchgate.net.* 2017 : 1-7.
18. Spurzem JR, Rennard SI. Pathogenesis of COPD. *SEMIN RESP CRIT CARE.*2015; 26 (2) : 142-153.

19. Panggabean MM. Gagal Jantung. Buku Ajar Ilmu Penyakit Dalam. Jakarta Pusat: InternaPublishing; 2014:1132-5.
20. Department of Economic and Social Affairs Population Division. World population ageing 2013. In: Nation U, editor. New York: United Nation; 2013. p.3.
21. Calton EK, Keane KN, Newsholme P, et al. The Impact of Vitamin D Levels on Inflammatory Status : A Systematic Review of Immune Cell Studies. *Soares MJ* 2015 ; 1-12.
22. Reddel HK, Bacharier L, Bateman ED, et al. Global initiative for asthma. Global Strategy for Asthma Management and Prevention. 2017.
23. Suarjana IN. Artritis Reumatoid. Buku Ajar Ilmu Penyakit Dalam. Jakarta Pusat: InternaPublishing; 2014:3130-50.
24. Huges DA, Norton R. Vitamin D and respiratory healt. *Clinical and Experimental Immunology* 2009 ; 158 : 20-25.
25. Chung KF and Adcock LM. Multifaceted mechanism in COPD: inflammation, immunity, and tissue repair and destruction. *Eur Respir J* 2008; 31:1334-56.
26. Dahesia M. Pathogenesis of COPD. *Clin Applied Immunol Rev* 2005;5:339
27. Burke SM, Issekutz TB, Mohan K, Lee PW, Shmulevitz M, Marshall JS. Human mast cell activation with virus-associated stimuli leads to the selective chemotaxis of natural killer cells by a CXCL8-dependent

- mechanism. *Blood* 2008;111: 5467-76.
28. Laterveer L, Lindley IJ, Hamilton MS, Willemze R, Fibbe WE. Interleukin-8 induces rapid mobilization of hematopoietic stem cells with radioprotective capacity and long-term myelolymphoid repopulating ability. *Blood* 1995;85: 2269-75.
29. Oemiati R. Kajian Epidemiologis Penyakit Paru Obstruktif Kronik (PPOK). *Media Litbangkes*.2013 ; 23 (2) : 82-88.
30. Ilyas M, Agussalim A, Megawati M , et al. Relationship between Vitamin D Level and Serum TNF- α Concentration on the Severity of Chronic Obstruktive Pulmonary Disease. *Open Access Maced J Med Sci*.2018 ; 7 (14) : 2298-2304.
31. Schulz C, Wolf K, Harth M, Kratzel K, Kunz-Schughart L, Pfeifer M. Expression and release of interleukin-8 by human bronchial epithelial cells from patients with chronic obstructive pulmonary disease, smokers, and never-smokers. *Respiration*. 2003;70:254e61
32. De Boer WI, Sont JK, van Schadewijk A, Stolk J, van Krieken JH, Hiemstra PS. Monocyte chemoattractant protein 1, interleukin 8, and chronic airways inflammation in COPD. *J Pathol* .2000;190:619e26.
33. Chung K.F. Cytokines in chronic obstructive pulmonary disease. *Eur Respir J*. 2001 ; 18 (34) : 50-59.
34. Nurdan K, Ayse B, Mok OY, et.al. Vitamin D deficiency. What does it mean

- for Chronic Obstructive Pulmonary Disease (COPD)? A concise Review for Pulmonologist. *The Clinical Respiratory Journal*. 2017 ;12(2) : 382-397
35. Raherison C, Gidoret PO. Epidemiology of COPD. *Eur Respir Rev*. 2009 ; 18 (114) : 213-221.
36. Woldeamanuel GG, Mingude AB, Geta TG. Prevalence of chronic obstructive pulmonary disease (COPD) and its associated factors among adults in Abeshge District, Ethiopia: a cross sectional study. *BMC Pulmonary Medicine*. 2019 ; 19 (181) : 1-9.
37. Donalson GC, Wedzicha JA. COPD exacerbations : Epidemiology. *Thorax*. 2006 ; (61) : 164-168.
38. Rawal G, Yadav S. Nutrition in chronic obstructive pulmonary disease : A review. *J Transl Int Med*. 2015 ; 3 : 151- 154.
39. Crim C, Dransfield MT, Bourbeau J, et al. Pneumonia risk with inhaled fluticasone furoate and vilanterol compared with vilanterol alone in patients with COPD. *Annals of the American Thoracic Society* 2015; 12(1): 27-34.
40. Riesco JA, Alcazar B, Trigueros JA, et al. active smoking and COPD phenotype: distribution and impact on prognostic factors. *Int J Chron Obstruct Pulmon Dis*.2017 ; 12 : 1989-1999
41. Calverley PMA, Pauwels R, Jones PW, et al. The severity of airways obstruction as a determinant of treatment response in COPD.*Int J Chron Obstruct Pulmon Dis*.2006 ; 1(3): 209-218.

42. 42.Suissa S, Aniello SD, Ernst P. Long-term natural history of chronic obstructive pulmonary disease: severe exacerbations and mortality. *Thorax*. 2012;67:957–963.
43. El-Dib A, Nagy H, Sabry W, El-Shimy W. A study of IL-6, IL-8, and TNF- α as inflammatory markers in COPD patients. Vol. 8, Egyptian Journal of Bronchology. 2014. p. 91.
44. 44.Yegorov S, Bromage S, Boldbaatar. N, et al. Effects of Vitamin D Supplementation and Seasonality on Circulating Cytokines in Adolescents: Analysis of Data From a Feasibility Trial in Mongolia. *Front. Nutr.* 2019 ; 6:166.
45. Huang AX, Lu wen L, Juan Liu W Huang M. Plasma Inflammatory Cytokine IL-4, IL-8, IL-10, and TNF-a Levels Correlate with Pulmonary Function in Patients with Asthma-Chronic Obstructive Pulmonary Disease (COPD) Overlap Syndrome.*Med Sci Monit*, 2016; 22: 2800-2808.
46. Pfeffer PE, Hawrylowicz CM. Vitamin D and lung disease . *Thorax*.2012 August 30; (139) ; 1018-1020.
47. Malinovschi A, Masoero M, Bellocchia M, et.al. Severe vitamin D deficiency is associated with frequent exacerbations and hospitalization in COPD patients. *Respiratory Research* 2014 ; 15 (131) : 1-8.
48. Khan DM, Ullah A, Randhawa FA, et.al. Role of Vitamin D in reducing number of acute exacerbations in Chronic Obstructive Pulmonary Disease (COPD) patients. *Pak J Med Sci* 2017 ; 33 (3) : 610-614.

49. Tumkaya M, Atis S, Ozge C, et.al. Relationship between airway colonization, inflammation and exacerbation frequency in COPD. *Respiratory Medicine* 2017 ; 101 : 729-737.
50. Anzueto A. Impact of exacerbations on COPD. *Eur Respir Rev*. 2010; 19:113-118.
51. Anthonisen NR, Manfreda J, Warren CP, et al. Antibiotic therapy in exacerbations of chronic obstructive pulmonary disease. *Ann Intern Med*. 1987 ; 106 : 196 -204.