

SCHWERPUNKT: Plötzlicher Herztod und koronare Herzkrankheit

- **Bewegung bei COPD- und KHK-Patienten – Transfer in die Praxis (S. 21–28)**

C. Graf, K. Brixius

Literatur:

1. Reiner M, Niermann C, Jekauc D, Woll A. Long-term health benefits of physical activity--a systematic review of longitudinal studies. *BMC Public Health* 2013; 13: 813
2. American Lung Association Epidemiology and Statistics Unit. Trends in COPD (Chronic Bronchitis and Emphysema): Morbidity and Mortality. 2013. (<http://www.lung.org/assets/documents/research/copd-trend-report.pdf>). Zugegriffen: 26.06.2019
3. Steppuhn H, Kuhnert R, Scheid-Nave C. 12-Monats-Prävalenz der bekannten chronisch obstruktiven Lungenerkrankung (COPD) in Deutschland. *Journal of Health Monitoring* 2017; 2: 46–54
4. Vogelmeier C, Buhl R, Burghuber O, Criée CP, Ewig S, Godnic-Cvar J, et al.; unter Mitwirkung der folgenden wissenschaftlichen Fachgesellschaften: Deutsche Gesellschaft für Arbeitsmedizin und Umweltmedizin e.V.; Deutsche Gesellschaft für Rehabilitationswissenschaften e.V. Leitlinie zur Diagnostik und Therapie von Patienten mit chronisch obstruktiver Bronchitis und Lungenemphysem. *Pneumologie* 2018; 72: 253–308
5. Maclay JD, MacNee W. Cardiovascular disease in COPD: mechanisms. *Chest* 2013; 143: 798–807
6. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Pulmonary Disease. 2019 Report. (<https://goldcopd.org/>). Zugegriffen: 26.06.2019
7. Boschetto P, Beghé B, Fabbri LM, Ceconi C. Link between chronic obstructive pulmonary disease and coronary artery disease: implication for clinical practice. *Respirology* 2012; 17: 422–431
8. Barnes PJ. Chronic obstructive pulmonary disease: effects beyond the lungs. *PLoS Med* 2010; 7: e1000220
9. van den Borst B, Gosker HR, Koster A, Yu B, Kritchevsky SB, Liu Y, et al.; Health, Aging, and Body Composition (Health ABC) Study. The influence of abdominal visceral fat on inflammatory pathways and mortality risk in obstructive lung disease. *Am J Clin Nutr* 2012; 96: 516–526
10. Zewari S, Vos P, van den Elshout F, Dekhuijzen R, Heijdra Y. Obesity in COPD: Revealed and Unrevealed Issues. *COPD* 2017; 14: 663–673
11. Lehr S, Hartwig S, Sell H. Adipokines: a treasure trove for the discovery of biomarkers for metabolic disorders. *Proteomics Clin Appl* 2012; 6: 91–101
12. Ansaldi AM, Montecucco F, Sahebkar A, Dallegri F, Carbone F. Epicardial adipose tissue and cardiovascular diseases. *Int J Cardiol* 2019; 278: 254–260
13. Sova M, Genzor S, Kolek V, Čtvrtlik F, Asswad AG, Zela O, Tauber Z. Epicardial fat in patients with chronic obstructive pulmonary disease as a marker of high cardiovascular risk - review. *Adv Respir Med* 2018; 86: 314–318
14. Pedersen BK, Febbraio MA. Muscles, exercise and obesity: skeletal muscle as a secretory organ. *Nat Rev Endocrinol* 2012; 8: 457–465
15. Febbraio MA, Pedersen BK. Muscle-derived interleukin-6: mechanisms for activation and possible biological roles. *FASEB J* 2002; 16: 1335–1347
16. Hayashino Y, Jackson JL, Hirata T, Fukumori N, Nakamura F, Fukuhara S, et al. Effects of exercise on C-reactive protein, inflammatory cytokine and adipokine in patients with type 2 diabetes: a meta-analysis of randomized controlled trials. *Metabolism* 2014; 63: 431–440
17. Soares FH, de Sousa MB. Different types of physical activity on inflammatory biomarkers in women with or without metabolic disorders: a systematic review. *Women Health* 2013; 53: 298–316
18. Boström P, Wu J, Jedrychowski MP, Korde A, Ye L, Lo JC, et al. A PGC1- α -dependent myokine that drives brown-fat-like development of white fat and thermogenesis. *Nature* 2012; 481: 463–468
19. Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Rep* 1985; 100: 126–131
20. Graf C, Ferrari N. Körperliche Aktivität, Sport und Bewegungstherapie bei (morbider) Adipositas. *Der Diabetologe* 2015; 11: 457–463
21. Graf C, Halle M. Aktuelle Aspekte im Herzsport. Von der Historie zum Status quo. *Der Kardiologe* 2015; 9: 67–80
22. Myers J, Prakash M, Froelicher V, Do D, Partington S, Atwood JE. Exercise capacity and mortality among men referred for exercise testing. *N Engl J Med* 2002; 346: 793–801
23. Holland AE, Spruit MA, Troosters T, Puhan MA, Pepin V, Saey D, et al. An official European Respiratory Society/American Thoracic Society technical standard: field walking tests in chronic respiratory disease. *Eur Respir J* 2014; 44: 1428–1446.
24. Ross R, Blair SN, Arena R, Church TS, Després JP, Franklin BA, et al.; American Heart Association Physical Activity Committee of the Council on Lifestyle and Cardiometabolic Health; Council on Clinical Cardiology; Council on Epidemiology and Prevention; Council on Cardiovascular and Stroke Nursing; Council on Functional Genomics and Translational Biology; Stroke Council. Importance of Assessing Cardiorespiratory Fitness in Clinical Practice: A Case for

- Fitness as a Clinical Vital Sign: A Scientific Statement From the American Heart Association. *Circulation* 2016; 134: e653–e699
25. Bernstein MS, Morabia A, Sloutskis D. Definition and prevalence of sedentarism in an urban population. *Am J Public Health* 1999; 89: 862–867
 26. Watz H, Pitta F, Rochester CL, Garcia-Aymerich J, ZuWallack R, Troosters T, et al. An official European Respiratory Society statement on physical activity in COPD. *Eur Respir J* 2014; 44: 1521–1537
 27. Abu-Omar K, Rütten A, Burlacu I, Messing S, Pfeifer K, Ungerer-Röhricht U. Systematischer Review von Übersichtsarbeiten zu Interventionen der Bewegungsförderung: Methode und erste Ergebnisse. *Gesundheitswesen* 2017; 79: S45–S50
 28. Rütten A, Pfeifer K. Nationale Empfehlungen für Bewegung und Bewegungsförderung. (<https://www.sport.fau.de/files/2016/05/Nationale-Empfehlungen-für-Bewegung-und-Bewegungsförderung-2016.pdf>). Zugegriffen: 26.06.2019
 29. Borg GA. Psychophysical bases of perceived exertion. *Med Sci Sports Exerc* 1982; 14: 377–381
 30. Gloeckl R, Schneeberger T, Jarosch I, Kenn K. Pulmonary Rehabilitation and Exercise Training in Chronic Obstructive Pulmonary Disease. *Dtsch Arztebl Int* 2018; 115: 117–123
 31. Gendron LM, Nyberg A, Saey D, Maltais F, Lacasse Y. Active mind-body movement therapies as an adjunct to or in comparison with pulmonary rehabilitation for people with chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2018; 10:CD012290
 32. Troosters T, Demeyer H. Physical Inactivity as a Missing Link in Understanding the Progression of Chronic Obstructive Pulmonary Disease. *Am J Respir Crit Care Med* 2015; 192: 267–269
 33. Waschki B, Kirsten AM, Holz O, Mueller KC, Schaper M, Sack AL, et al. Disease progression and changes in physical activity in patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2015; 192: 295–306
 34. Furlanetto KC, Donária L, Schneider LP, Lopes JR, Ribeiro M, Fernandes KB, et al. Sedentary Behavior Is an Independent Predictor of Mortality in Subjects With COPD. *Respir Care* 2017; 62: 579–587
 35. van Ranst D, Stoop WA, Meijer JW, Otten HJ, van de Port IG. Reduction of exacerbation frequency in patients with COPD after participation in a comprehensive pulmonary rehabilitation program. *Int J Chron Obstruct Pulmon Dis* 2014; 9: 1059–1067
 36. Peres A, Dorneles GP, Dias AS, Vianna P, Chies JAB, Monteiro MB. T-cell profile and systemic cytokine levels in overweight-obese patients with moderate to very-severe COPD. *Respir Physiol Neurobiol* 2018; 247: 74–79
 37. van den Borst B, Gosker HR, Wesseling G, de Jager W, Hellwig VA, Snepvangers FJ, Schols AM. Low-grade adipose tissue inflammation in patients with mild-to-moderate chronic obstructive pulmonary disease. *Am J Clin Nutr* 2011; 94: 1504–1512
 38. Zeyda M, Farmer D, Aszmann O, Speiser M, Zlabinger GJ, Stulnig TM. Human adipose tissue macrophages are of an anti-inflammatory phenotype but capable of excessive pro-inflammatory mediator production. *Int J Obes* 2007; 31: 1420–1428
 39. Leal LG, Lopes MA, Batista ML Jr. Physical Exercise-Induced Myokines and Muscle-Adipose Tissue Crosstalk: A Review of Current Knowledge and the Implications for Health and Metabolic Diseases. *Front Physiol* 2018; 9: 1307
 40. Petersen AMW, Pedersen BK. The anti-inflammatory effect of exercise. *J Appl Physiol* 2005; 98: 1154–1162
 41. Bianco A, Mazzarella G, Turchiarelli V, Nigro E, Corbi G, Scudiero O, et al. Adiponectin: an attractive marker for metabolic disorders in Chronic Obstructive Pulmonary Disease (COPD). *Nutrients* 2013; 5: 4115–4125
 42. Limpawattana P, Inthusawan P, Putraveephong S, Boonsawat W, Theerakulpisit D, Sawanyawisuth K. Sarcopenia in chronic obstructive pulmonary disease: A study of prevalence and associated factors in the Southeast Asian population. *Chron Respir Dis* 2018; 15: 250–257
 43. Costa TM, Costa FM, Moreira CA, Rabelo LM, Boguszewski CL, Borba VZ. Sarcopenia in COPD: relationship with COPD severity and prognosis. *J Bras Pneumol* 2015; 41: 415–421
 44. Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyère O, Cederholm T, et al.; Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2. Sarcopenia: revised European consensus on definition and diagnosis. *Age Ageing* 2019; 48: 16–31
 45. Anderson L, Thompson DR, Oldridge N, Zwisler AD, Rees K, Martin N, et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database Syst Rev* 2016; (1):CD001800
 46. Volaklis KA, Tokmakidis SP, Halle M. Acute and chronic effects of exercise on circulating endothelial progenitor cells in healthy and diseased patients. *Clin Res Cardiol* 2013; 102: 249–257
 47. Guo Y, Ledesma RA, Peng R, Liu Q, Xu D. The Beneficial Effects of Cardiac Rehabilitation on the Function and Levels of Endothelial Progenitor Cells. *Heart Lung Circ* 2017; 26: 10–17
 48. Fuster JJ, Ouchi N, Gokce N, Walsh K. Obesity-induced changes in adipose tissue microenvironment and their impact on cardiovascular disease. *Circ Res* 2016; 118: 1786–1807
 49. Swardfager W, Herrmann N, Cornish S, Mazereeuw G, Marzolini S, Sham L, et al. Exercise intervention and inflammatory markers in coronary artery disease: a meta-analysis. *Am Heart J* 2012; 16: 666–676
 50. Di Raimondo D, Tuttolomondo A, Musiari G, Schimmenti C, D'Angelo A, Pinto A. Are the Myokines the Mediators of Physical Activity-Induced Health Benefits? *Curr Pharm Des* 2016; 22: 3622–3647
 51. Rabkin SW, Campbell H. Comparison of reducing epicardial fat by exercise, diet or bariatric surgery weight loss strategies: a systematic review and meta-analysis. *Obes Rev* 2015; 16: 406–415

52. Kaneda H, Nakajima T, Haruyama A, Shibasaki I, Hasegawa T, Sawaguchi T, et al. Association of serum concentrations of irisin and the adipokines adiponectin and leptin with epicardial fat in cardiovascular surgery patients. *PLoS One* 2018; 13: e0201499
53. Finger J, Mensink G, Lange C, Manz K. Gesundheitsfördernde körperliche Aktivität in der Freizeit bei Erwachsenen in Deutschland. *Journal of Health Monitoring* 2017; 2: 37–44
54. Demeyer H, Gimeno-Santos E, Rabinovich RA, Hornikx M, Louvaris Z, de Boer WI, et al.; PROactive consortium. Physical Activity Characteristics across GOLD Quadrants Depend on the Questionnaire Used. *PLoS One* 2016; 11: e0151255
55. Najem SA, Groll A, Schmermund A, Nowak B, Voigtlander T, Kaltenbach U, et al. Walking activity during ambulant cardiac rehabilitation is related to maximum working capacity, age, and smoking behavior. *Vasc Health Risk Manag* 2018; 14: 361–369
56. Sonntag U, Wiesner J, Fahrenkrog S, Renneberg B, Braun V, Heintze C. Motivational interviewing and shared decision making in primary care. *Patient Educ Couns* 2012; 87: 62–66
57. Bravata DM, Smith-Spangler C, Sundaram V, Gienger AL, Lin N, Lewis R, et al. Using pedometers to increase physical activity and improve health: a systematic review. *JAMA* 2007; 298: 2296–2304