

## Literatura ACTA MEDICINAE 2/2018 Diabetologie

- 3 **Využití potenciálu ARNI pro léčbu srdečního selhání u pacientů s diabetem**  
prof. MUDr. Milan Kvapil, CSc., MBA Interní klinika FN v Motole a 2. LF UK, Praha
- 3 **Hepatitida C a diabetes mellitus 2. typu**  
prof. MUDr. Petr Urbánek, CSc. Interní klinika 1. LF UK a ÚVN, Praha
- 3 **Ezetimib pro všechny pacienty s diabetem?**  
prof. MUDr. Milan Kvapil, CSc., MBA Interní klinika FN v Motole a 2. LF UK, Praha
- 4 **CVD-REAL: reálný přínos gliflozinů pro léčbu diabetiků 2. typu v běžné klinické praxi**  
doc. MUDr. Alena Šmahelová, Ph.D. III. interní gerontometabolická klinika FN a LF UK, Hradec Králové
- 4 **Kardiální autonomní neuropatie – klinické důsledky a možnosti terapie**  
MUDr. Barbora Pelechová | MUDr. Šárka Malá | prof. MUDr. Milan Kvapil, CSc., MBA Interní klinika FN v Motole a 2. LF UK, Praha
- 4 **Nové možnosti kontinuální monitorace glykemie**  
MUDr. Jan Šoupal, Ph.D. | Mgr. Aneta Hásková III. interní klinika VFN a 1. LF UK, Praha
- 5 **Jakou novou kvalitou může přinést fixní kombinace bazálního inzulínového analogu a agonisty receptoru pro glucagon-like peptid-1**  
MUDr. Jindřich Olšovský, Ph.D. II. interní klinika LF MU a FN u sv. Anny v Brně
- 5 **Přínos telemonitoringu u pacientek s gestačním diabetem**  
Ing. Jiří Potůček, CSc. | Ing. Lukáš Roubík Institut pro podporu elektronizace zdravotnictví, Praha
- 5 **Potřebujeme studie z reálné klinické praxe?**  
MUDr. Denisa Žďárská-Janíčková, Ph.D. Interní klinika 2. LF UK a FN v Motole, Praha
- 5 **Léčba inhibitory DPP-4 v kombinaci s inzulínem**  
MUDr. Marek Honka Diabetologická a endokrinologická ambulance Lestela Hlučín, s. r. o.
- 6 **iGlarLixi (Suliqua) – nová fixní kombinace inzulínu glargin a lixisenatidu – lékový profil**  
MUDr. Jiří Slíva, Ph.D. Ústav farmakologie 3. LF UK, Praha
- 6 **Možnosti intenzifikace léčby bazálním inzulínem**  
MUDr. Denisa Žďárská-Janíčková, Ph.D. Interní klinika 2. LF UK a FN v Motole, Praha
- 6 **Berberin**  
MUDr. Barbora Nussbaumerová, Ph.D. Centrum preventivní kardiologie, II. interní klinika LF a FN v Plzni, UK v Praze
- 7 **Trapiby a HDL-hypotéza: otevřený příběh**  
MUDr. Michaela Šnejdrlová, Ph.D. | prof. MUDr. Richard Češka, CSc. Centrum preventivní kardiologie, III. interní klinika endokrinologie a metabolismu VFN a 1. LF UK, Praha

## Literatura ACTA MEDICINAE 3/2018 Kardiologie

- 8 **Glifloziny – naděje pro diabetiky s kardiovaskulárním onemocněním**  
prof. MUDr. Jiří Vítovec, CSc., FESC I. interní kardiologická klinika LF MU a FN u sv. Anny v Brně  
prof. MUDr. Jindřich Špinar, CSc., FESC Interní kardiologická klinika FN Brno  
prof. MUDr. Lenka Špinarová, Ph.D., FESC I. interní kardiologická klinika LF MU a FN u sv. Anny v Brně
- 8 **Inhibitory DPP-4 a agonisté receptoru pro GLP-1 se nevzdávají**  
prof. MUDr. Milan Kvapil, CSc., MBA Interní klinika FN v Motole a 2. LF UK, Praha
- 8 **Bude inclisiran ještě účinnější na kardiovaskulární příhody než monoklonální protilátky proti PCSK9?**  
prof. MUDr. Vladimír Blaha, CSc. III. interní gerontometabolická klinika LF UK a FN Hradec Králové
- 8 **Metoprolol – význam lékové formy pro dosažení optimálního efektu**  
prof. MUDr. Jan Bultas, CSc. Farmakologický ústav 3. LF UK, Praha
- 9 **Fixní kombinace perindopril argininu s amlodipinem: klinické zkušenosti**  
prof. MUDr. Jiří Widimský jr., CSc. III. interní klinika – Centrum pro hypertenzi VFN a 1. LF UK, Praha
- 9 **Ezetimib a jeho postavení v léčbě hyperlipoproteinemie**  
doc. MUDr. Tomáš Kovárník, Ph.D. II. interní klinika kardiologie a angiologie VFN v Praze a 1. LF UK, Praha  
MUDr. Michaela Šnejdrová, Ph.D. III. interní klinika endokrinologie a metabolismu VFN v Praze a 1. LF UK, Praha  
MUDr. Karel Kopřiva Kardiologické oddělení Nemocnice Na Homolce, Praha
- 9 **Fabryho choroba – myslíme na ni ve své praxi?**  
doc. MUDr. David Zemánek, Ph.D. II. interní klinika kardiologie a angiologie VFN a 1. LF UK, Praha
- 10 **Využití sartanů k ovlivnění poškození cílových orgánů a snížení KV rizika. Účinek antihypertenziv nekončí kontrolou krevního tlaku**  
doc. MUDr. Jan Václavík, Ph.D. Centrum pro hypertenzi, I. interní klinika – kardiologická, FN Olomouc a LF UP, Olomouc
- 10 **Pacient s fibrilací síní podstupuje koronární intervenci: antitrombotická léčba ve světle nových studií**  
MUDr. Petr Janský Klinika kardiovaskulární chirurgie 2. LF UK a FN v Motole, Praha
- 10 **Antitrombotická léčba po akutním koronárním syndromu – update 2017. Jaká, komu a jak dlouho?**  
MUDr. Roman Miklík, Ph.D. | MUDr. Marie Pavlušová Interní kardiologická klinika, FN a LF MU, Brno
- 11 **Veno-venózní ECMO a včasná identifikace rizika a management spontánního intrakraniálního krvácení**  
MUDr. Jiří Slíva, MD., Ph.D. Ústav farmakologie 3. LF UK, Praha
- 11 **Proč mají kardiologové diagnostikovat u pacientů spánkovou apnoe**  
MUDr. Jiří Veselý Kardiologická ambulance EDUMED Broumov

# Využití potenciálu ARNI pro léčbu srdečního selhání u pacientů s diabetem

prof. MUDr. Milan Kvapil, CSc., MBA Interní klinika FN v Motole a 2. LF UK, Praha

- 1 Brož, J. – Honěk, P. – Dušek, L. – Pavlík, T. – Kvapil, M.: The mortality of patients with diabetes mellitus using oral antidiabetic drugs in the Czech Republic decreased over the decade of 2003–2013 and came closer to the population average. *Vnitřní Léčba*, 2015, 61, suppl. 3, s. 3514–20.
- 2 Ather, S. – Chan, W. – Bozkurt, B., et al.: Impact of noncardiac comorbidities on morbidity and mortality in a predominantly male population with heart failure and preserved versus reduced ejection fraction. *J Am Coll Cardiol*, 2012, 59, s. 998–1005.
- 3 Murcia, A. M. – Hennekens, C. H. – Lamas, G. A., et al.: Impact of diabetes on mortality in patients with myocardial infarction and left ventricular dysfunction. *Arch Intern Med*, 2004, 164, s. 2273–2279.
- 4 Zinman, B. – Wanner, C. – Lachin, J. M., et al.: EMPA-REG OUTCOME Investigators: Empagliflozin, cardiovascular outcomes, and mortality in type 2 diabetes. *N Engl J Med*, 2015, 373, s. 2117–2128.
- 5 Marso, S. P. – Daniels, G. H. – Brown-Frandsen, K., et al.: LEADER Steering Committee; LEADER Trial Investigators: Liraglutide and cardiovascular outcomes in type 2 diabetes. *N Engl J Med*, 2016, 375, s. 311–322.
- 6 Jhund, P. S. – McMurray, J. J.: The neprilysin pathway in heart failure: a review and guide on the use of sacubitril/valsartan. *Heart*, 2016, 102, s. 1342–1347.
- 7 McMurray, J. J. – Packer, M. – Desai, A. S., et al.: PARADIGM-HF Investigators and Committees: Angiotensin-neprilysin inhibition versus enalapril in heart failure. *N Engl J Med*, 2014, 371, s. 993–1004.
- 8 Malek, V. – Gaikwad, A. B.: Neprilysin inhibitors: A new hope to halt the diabetic cardiovascular and renal complications? *Biomed Pharmacother*, 2017, 90, s. 752–759.
- 9 Jordan, J. – Stinkens, R. – Jax, T., et al.: Improved insulin sensitivity with angiotensin receptor neprilysin inhibition in individuals with obesity and hypertension. *Clin Pharmacol Ther*, 2017, 101, s. 254–263.
- 10 Suematsu, Y. – Miura, S. – Goto, M., et al.: LCZ696, an angiotensin receptor-neprilysin inhibitor, improves cardiac function with the attenuation of fibrosis in heart failure with reduced ejection fraction in streptozotocin-induced diabetic mice. *Eur J Heart Fail*, 2016, 18, s. 386–393.
- 11 Coppey, L. – Davidson, E. – Lu, B., et al.: Vasopeptidase inhibitor ilepatril (AVE7688) prevents obesity- and diabetes-induced neuropathy in C57BL/6J mice. *Neuropharmacology*, 2011, 60, s. 259–266.
- 12 Kristensen, S. L. – Preiss, D. – Jhund, P. S., et al.: PARADIGM-HF Investigators and Committees: Risk related to pre-diabetes mellitus and diabetes mellitus in heart failure with reduced ejection fraction: insights from prospective comparison of ARNI with ACEI to determine impact on global mortality and morbidity in heart failure trial. *Circ Heart Fail*, 2016, 9, pii: e002560, doi: 10.1161/CIRCHEARTFAILURE.115.002560.

## Hepatitis C a diabetes mellitus 2. typu

prof. MUDr. Petr Urbánek, CSc. Interní klinika 1. LF UK a ÚVN, Praha

- 1 Antonelli, A. – Ferri, C. – Fallahi, P., et al.: Hepatitis C virus infection: evidence for an association with type 2 diabetes. *Diabetes Care*, 2005, 28, s. 2548–2550.
- 2 Antonelli, A. – Ferri, C., et al.: Type 2 diabetes in hepatitis C-related mixed cryoglobulinaemia patients. *Rheumatology (Oxford)*, 2004, 43, s. 238–240.
- 3 Chen, H. F. – Li, C. Y. – Chen, P., et al.: Seroprevalence of hepatitis B and C in type 2 diabetic patients. *J Chin Med Assoc*, 2006, 69, s. 146–152.
- 4 Imazeki, F. – Yokosuka, O. – Fukai, K., et al.: Prevalence of diabetes mellitus and insulin resistance in patients with chronic hepatitis C: comparison with hepatitis B virus-infected and hepatitis C virus-cleared patients. *Liver Int*, 2008, 28, s. 355–362.
- 5 Butt, A. A. – Khan, U. A. – McGinnis, K. A., et al.: Co-morbid medical and psychiatric illness and substance abuse in HCV-infected and uninfected veterans. *J Viral Hepat*, 2007, 14, s. 890–896.
- 6 Lecube, A. – Hernandez, C. – Genesca, J., et al.: High prevalence of glucose abnormalities in patients with hepatitis C virus infection: a multivariate analysis considering the liver injury. *Diabetes Care*, 2004, 27, s. 1171–1175.
- 7 Huang, J. F. – Dai, C. Y. – Hwang, S. J., et al.: Hepatitis C viremia increases the association with type 2 diabetes mellitus in a hepatitis B and C endemic area: an epidemiological link with virological implication. *Am J Gastroenterol*, 2007, 102, s. 1237–1243.
- 8 Butt, A. A. – Fultz, S. L. – Kwok, C. K., et al.: Risk of diabetes in HIV infected veterans pre- and post-HAART and the role of HCV coinfection. *Hepatology*, 2004, 40, s. 115–119.
- 9 Fabrizi, F. – Martin, P. – Dixit, V., et al.: Post-transplant diabetes mellitus and HCV seropositive status after renal transplantation: meta-analysis of clinical studies. *Am J Transplant*, 2005, 5, s. 2433–2440.
- 10 White, D. L. – Ratzliff, W. – El-Serag, H. B.: Hepatitis C infection and risk of diabetes: A systematic review and meta-analysis. *J Hepatol*, 2008, 49, s. 831–844.
- 11 Patel, S. – Jinjivadia, R. – Patel, R., et al.: Insulin resistance is associated with significant liver fibrosis in chronic hepatitis C patients: a systemic review and meta-analysis. *J Clin Gastroenterol*, 2016, 50, s. 80–84.
- 12 Naing, C. – Mak, J. W. – Ahmed, S. I., et al.: Relationship between hepatitis C virus infection and type 2 diabetes mellitus: meta-analysis. *World J Gastroenterol*, 2012, 18, s. 1642–1651.
- 13 Ruhl, C. E. – Menke, A. – Cowie, C. C., et al.: Relationship of hepatitis C virus infection with diabetes in the U.S. population. *Hepatology*, 2014, 60, s. 1139–1149.
- 14 Elkrief, L. – Chouinard, P. – Bendersky, N., et al.: Diabetes mellitus is an independent prognostic factor for major liver-related outcomes in patients with cirrhosis and chronic hepatitis C. *Hepatology*, 2014, 60, s. 823–831.
- 15 Wang, C. S. – Yao, W. J. – Chang, T. T., et al.: The impact of type 2 diabetes on the development of hepatocellular carcinoma in different viral hepatitis statuses. *Cancer Epidemiol Biomarkers Prev*, 2009, 18, s. 2054–2060.
- 16 Antonelli, A. – Ferrari, S. M. – Giuglioli, D., et al.: Hepatitis C virus infection and type 1 and type 2 diabetes mellitus. *World J Diabetes*, 2014, 5, s. 586–600.
- 17 Lai, S. W. – Chen, P. C. – Liao, K. F., et al.: Risk of hepatocellular carcinoma in diabetic patients and risk reduction associated with anti-diabetic therapy: a population-based cohort study. *Am J Gastroenterol*, 2012, 107, s. 46–52.
- 18 García-Compeán, D. – González-González, J. A. – Lavalle-González, F. J., et al.: Current concepts in diabetes mellitus and chronic liver disease: clinical outcomes, hepatitis C virus association, and therapy. *Dig Dis Sci*, 2016, 61, s. 371–380.
- 19 Wong, R. J. – Gish, R. G.: Metabolic manifestations and complications associated with chronic hepatitis C virus infection. *Gastroenterol Hepatol (N Y)*, 2016, 12, s. 293–299.
- 20 Youngren, J. F.: Regulation of insulin receptor function. *Cell Mol Life Sci*, 2007, 64, s. 873–891.
- 21 Paziienza, V. – Clément, S. – Pugnale, P., et al.: The hepatitis C virus core protein of genotypes 3a and 1b downregulates insulin receptor substrate 1 through genotype-specific mechanisms. *Hepatology*, 2007, 45, s. 1164–1171.
- 22 Persico, M. – Capasso, M. – Persico, E., et al.: Suppressor of cytokine signaling 3 (SOCS3) expression and hepatitis C virus-related chronic hepatitis: Insulin resistance and response to antiviral therapy. *Hepatology*, 2007, 46, s. 1009–1015.
- 23 Funaoka, Y. – Sakamoto, N. – Suda, G., et al.: Analysis of interferon signaling by infectious hepatitis C virus clones with substitutions of core amino acids 70 and 91. *J Virol*, 2011, 85, s. 5986–5994.
- 24 Akuta, N. – Suzuki, F. – Hirakawa, M., et al.: Amino acid substitution in hepatitis C virus core region and genetic variation near the interleukin 28B gene predict viral response to telaprevir. *Hepatology*, 2010, 52, s. 421–429.
- 25 Iwane, S. – Mizuta, T. – Kawaguchi, Y., et al.: Impact of body weight reduction via diet and exercise on the anti-viral effects of pegylated interferon plus ribavirin in chronic hepatitis C patients with insulin resistance: a randomized controlled pilot trial. *Intern Med*, 2015, 54, s. 3113–3119.
- 26 Vanni, E. – Bugianesi, E. – Saracco, G.: Treatment of type 2 diabetes mellitus. *Dig Liver Dis*, 2016, 48, s. 105–111.
- 27 Aghemo, A. – Prati, G. M. – Rumi, M. G., et al.: Sustained virological response prevents the development of insulin resistance in patients with chronic hepatitis C. *Hepatology*, 2012, 56, s. 1681–1687.
- 28 Arase, Y. – Suzuki, F. – Suzuki, Y., et al.: Sustained virological response reduces incidence on onset of type 2 diabetes in chronic hepatitis C. *Hepatology*, 2009, 49, s. 739–744.

## Ezetimib pro všechny pacienty s diabetem?

prof. MUDr. Milan Kvapil, CSc., MBA Interní klinika FN v Motole a 2. LF UK, Praha

- 1 Castelli, W. P. – Garrison, R. J. – Wilson, P. W., et al.: Incidence of coronary heart disease and lipoprotein cholesterol levels: the Framingham Study. *JAMA*, 256, s. 2835–2838.
- 2 Kwietowich, P. O. E. Jr.: The antiatherogenic role of high-density lipoprotein cholesterol. *Am J Cardiol*, 1998, 82, s. 13Q–21Q.
- 3 Collins, R. – Armitage, J. – Parish, S., et al.: MRC/BHF Heart Protection Study of cholesterol-lowering with simvastatin in 5963 people with diabetes: a randomised placebo-controlled trial. *Lancet*, 2003, 361, s. 2005–2016.
- 4 Godberg, R. B. – Melies, M. J. – Sacks, F. M., et al.: Cardiovascular events and their reduction with pravastatin in diabetic and glucose-intolerant myocardial infarction survivors with average cholesterol levels: subgroup analyses in the Cholesterol and Recurrent Events (CARE) trial. *Circulation*, 1998, 98, s. 2513–2519.
- 5 Haffner, S. M. – Lehto, S. – Ronnema, T., et al.: Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without previous myocardial infarction implications treatment of hyperlipidemia in diabetic subjects without prior myocardial infarction. *N Engl J Med*, 1998, 339, s. 229–234.
- 6 The Long-Term Intervention with Pravastatin in Ischemic Disease (LIPID) Study Group: Prevention of cardiovascular events and death with pravastatin in patients with coronary heart disease and a broad range of initial cholesterol levels. *N Engl J Med*, 1998, 339, s. 1349–1357.
- 7 MRC/BHF High Protection Study of cholesterol lowering with simvastatin in 20 536 high-risk individuals: a randomised placebo-controlled trial. *Lancet*, 2002, 360, s. 7–22.
- 8 Pyörälä, K. – Pederson, T. R. – Kiekshus, J., et al.: Cholesterol lowering with simvastatin improves prognosis of diabetic patients with coronary heart disease: a subgroup analysis of the Scandinavian Simvastatin Survival Study (4S). *Diabetes Care*, 1997, 20, s. 614–620.
- 9 Scandinavian Simvastatin Survival Study Group: Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease: The Scandinavian Simvastatin Survival Study (4S). *Lancet*, 1994, 344, s. 1383–1389.
- 10 Simes, J. – Furberg, C. D. – Braunwald, E., et al.: Effects of pravastatin on mortality in patients with and without coronary disease across a broad range of cholesterol levels: The Prospective Pravastatin Pooling Project. *Eur Heart J*, 2002, 23, s. 207–215.
- 11 Šmahelová, A. – Zadák, Z. – Hyšpler, R., et al.: Význam rostlinných sterolů u diabetiků. *Vnitřní Léčba*, 2004, 50, s. 147–152.
- 12 Charvát, J., et al.: Diabetes mellitus a makrovasculární komplikace. *Triton*, Praha, 2001, s. 203.
- 13 Rubins, H. B. – Robins, S. J., et al.: Gemfibrozil for the secondary prevention of coronary heart disease in men with low levels of high-density lipoprotein cholesterol. *N Engl J Med*, 1998, 341, s. 410–418.
- 14 Austin, M. A.: Plasma triglyceride and coronary heart disease. *Atheroscler Thromb*, 1991, 11, s. 2–14.
- 15 Hokanson, J. E. – Austin, M. A.: Plasma triglyceride level is a risk factor for cardiovascular disease independent of high-density lipoprotein cholesterol level: a metaanalysis of population-based prospective studies. *J Cardiovasc Risk*, 1996, 3, s. 213–219.
- 16 UK Prospective Diabetes Study (UKPDS) Group: Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *Lancet*, 1998, 352, s. 837–853.
- 17 Clader, J. W.: The discovery of ezetimibe: A view from outside the receptor. *J Med Chem*, 2004, 41, s. 1–9.
- 18 Bays, H.: Ezetimibe. *Expert Opin Investig Drugs*, 2002, 11, s. 1587–1604.
- 19 Altmann, S. W., et al.: Niemann-Pick C1 like protein is critical for intestinal absorption. *Science*, 2004, 303, s. 1201–1204.
- 20 Dujovne, C. A. – Ettinger, M. P. – McNeer, J. F., et al.: Efficacy and safety of a potent new selective cholesterol absorption inhibitor ezetimibe in patients with primary hypercholesterolemia. *Am J Cardiol*, 2002, 90, s. 1092–1097.
- 21 Knopp, R. H. – Gitter, H. – Truitt, T., et al.: Effect of ezetimibe, a new cholesterol absorption inhibitor, on plasma lipids in patients with primary hypercholesterolemia. *Eur Heart J*, 2003, 24, s. 729–741.
- 22 Bays, H. E., et al.: Effectiveness and tolerability of ezetimibe in patients with primary hypercholesterolemia: pooled analysis two phase

- II studies. *Clin Ther*, 2001, 23, s. 1209–1230.
- 23 Sudhop, T., et al.: Inhibition of intestinal cholesterol absorption by ezetimibe in humans. *Circulation*, 2002, 106, s. 1943–1948.
  - 24 Davidson, M. H. – McGarry, T. – Bettis, R., et al.: Ezetimibe coadministered with simvastatin in patients with primary hypercholesterolemia. *J Am Coll Cardiol*, 2002, 40, s. 2125–2134.
  - 25 Gagne, C. – Gaudet, D. – Bruckert, E.: Efficacy and safety of ezetimibe coadministered with atorvastatin or simvastatin in patients with homozygous familial hypercholesterolemia. *Circulation*, 2002, 105, s. 2469–2475.
  - 26 Patrick, J. E. – Kosoglou, T. – Stauber, K. L., et al.: Disposition of the selective cholesterol absorption inhibitor ezetimibe in healthy male subjects. *Drug Metab Dispos*, 2002, 30, s. 430–437.
  - 27 Ezzet, F. – Wexler, D. – Statkevich, P., et al.: The plasma concentration and LDL-C relationship in patients receiving ezetimibe. *J Clin Pharmacol*, 2001, 41, s. 943–949.
  - 28 Sudhop, T., et al.: Inhibition of intestinal cholesterol absorption by ezetimibe in humans. *Circulation*, 2002, 106, s. 1943–1948.
  - 29 Gagne, C. – Bays, H. E. – Weiss, S. R., et al.: Efficacy and safety of ezetimibe added to ongoing statin therapy for treatment of patients with primary hypercholesterolemia. *Am J Cardiol*, 2002, 90, s. 1084–1091.
  - 30 Sager, P. T. – Melani, L. – Lipka, L., et al.: Ezetimibe Study Group: Effect of coadministration of ezetimibe and simvastatin on sensitivity C-reactive protein. *Am J Cardiol*, 2003, 92, s. 1414–1418.
  - 31 Cannon, C. P. – Blazing, M. A. – Giugliano, R. P., et al.: IMPROVE-IT Investigators: Ezetimibe added to statin therapy after acute coronary syndromes. *N Engl J Med*, 2015, 372, s. 2387–2397.
  - 32 Bohula, E. A. – Wiviott, S. D. – Giugliano, R. P., et al.: Prevention of stroke with the addition of ezetimibe to statin therapy in patients with acute coronary syndrome in IMPROVE-IT (Improved Reduction of Outcomes: Vytorin Efficacy International Trial). *Circulation*, 2017, 136, s. 2440–2450.
  - 33 Mok, H. Y. – von Bergmann, K. – Grundy, S. M.: Effects of continuous and intermittent feeding on biliary lipid outputs in man: application for measurements of intestinal absorption of cholesterol and bile acids. *J Lipid Res*, 1979, 20, s. 389–398.
  - 34 Gylling, H. – Miettinen, T. A.: Cholesterol absorption and lipoprotein metabolism in type II diabetes mellitus with and without coronary artery disease. *Atherosclerosis*, 1996, 126, s. 325–332.
  - 35 Okada, K. – Yagyu, H. – Kotani, K., et al.: Lipid-lowering effects of ezetimibe for hypercholesterolemic patients with and without type 2 diabetes mellitus. *Endocr J*, 2010, 57, s. 903–908.
  - 36 Illingworth, D. R. – Crouse, J. R. – Hunninghake, D. B., et al.: A comparison of simvastatin and atorvastatin up to maximal recommended doses in a large multicenter randomized clinical trial. *Curr Med Res Opin*, 2001, 17, s. 43–50.
  - 37 Stein, E. A. – Davidson, M. H. – Dobs, A. S., et al.: Efficacy and safety of simvastatin 80 mg/day in hypercholesterolemic patients. *Am J Cardiol*, 1998, 82, s. 311–316.
  - 38 Davidson, M. H. – Stein, E. A. – Hunninghake, D. B., et al.: Lipid-altering efficacy and safety of simvastatin 80 mg/day: worldwide long-term experience in patients with hypercholesterolemia. *Nutr Metab Cardiovasc Dis*, 2000, 10, s. 253–263.
  - 39 Savarese, G. – De Ferrari, G. M. – Rosano, G. M., et al.: Safety and efficacy of ezetimibe: A meta-analysis. *Int J Cardiol*, 2015, 201, s. 247–252.
  - 40 Myocardial Infarction Genetics Consortium Investigators: Inactivating mutations in NPC1L1 and protection from coronary heart disease. *N Engl J Med*, 2014, 371, s. 2072–2082.
  - 41 Holme, I. – Boman, K. – Brudi, P., et al.: Observed and predicted reduction of ischemic cardiovascular events in the simvastatin and ezetimibe in aortic stenosis trial. *Am J Cardiol*, 2010, 105, s. 1802–1808.

## CVD-REAL: reálný přínos gliflozinů pro léčbu diabetiků 2. typu v běžné klinické praxi

doc. MUDr. Alena Šmahelová, Ph.D. III. interní gerontometabolická klinika FN a LF UK, Hradec Králové

- 1 Zinman, B. – Wanner, C. – Lachin, J. M., et al.: EMPA-REG OUTCOME Investigators: Empagliflozin, cardiovascular outcomes, and mortality in type 2 diabetes. *N Engl J Med*, 2015, 373, s. 2117–2128, doi: 10.1056/NEJMoa1504720.
- 2 Neal, B. – Perkovic, V. – Mahaffey, K. W., et al.: CANVAS Program Collaborative Group: Canagliflozin and cardiovascular and renal events in type 2 diabetes. *N Engl J Med*, 2017, 377, s. 644–657, doi: 10.1056/NEJMoa1611925.
- 3 Kosiborod, M. – Cavender, M. A. – Fu, A. Z., et al.: CVD-REAL Investigators and Study Group: Lower risk of heart failure and death in patients initiated on SGLT-2 inhibitors versus other glucose-lowering drugs: the CVD-REAL study. *Circulation*, 2017, 136, s. 249–259.
- 4 Birkeland, K. – Jørgensen, M. E. – Carstensen, B., et al.: Cardiovascular mortality and morbidity in patients with type 2 diabetes following initiation of sodium-glucose co-transporter-2 inhibitors versus other glucose-lowering drugs (CVD-REAL Nordic): a multinational observational analysis. Dostupné z: [www.thelancet.com/diabetes-endocrinology](http://www.thelancet.com/diabetes-endocrinology), publikováno 3. 8. 2017, [http://dx.doi.org/10.1016/S2213-8587\(17\)30258-9](http://dx.doi.org/10.1016/S2213-8587(17)30258-9).
- 5 Kosiborod, M. – Lam, C. S. P. – Kohnsaka, S., et al.: jménem CVD-REAL Investigators and Study Group: Lower cardiovascular risk associated with SGLT-2i in >400,000 patients: The CVD-REAL 2 Study. *J Am Coll Cardiol*, 2018, doi: 10.1016/j.jacc.2018.03.009.
- 6 DECLARE TIMI 58. TIMI Study Group website. Dostupné z: [timl.org/index.php?page=declare-timi-58](http://timl.org/index.php?page=declare-timi-58), vyhledáno 13. 2. 2018.
- 7 Study to evaluate the effect of dapagliflozin on the incidence of worsening heart failure or cardiovascular death in patients with chronic heart failure. Dostupné z: [clinicaltrials.gov/ct2/show/NCT03036124](http://clinicaltrials.gov/ct2/show/NCT03036124), vyhledáno 13. 2. 2018.
- 8 EMPagliflozin outcome tRIal in Patients With chrOnic heart Failure With Reduced Ejection Fraction (EMPEROR-Reduced). Clinical Trials.gov; <https://clinicaltrials.gov/ct2/show/NCT03057977>.
- 9 EMPagliflozin outcome tRIal in Patients With chrOnic heart Failure With Preserved Ejection Fraction (EMPEROR-Preserved). Clinical Trials.gov; <https://clinicaltrials.gov/ct2/show/NCT03057951>.
- 10 Raz, I. – Mosenzon, O. – Bonaca, M. P., et al.: Declare-TIMI 58: Participants' baseline characteristics. *Diabetes Obes Metab*, 11. 1. 2018, doi: 10.1111/dom.13217, Epub před tiskem.

## Kardiální autonomní neuropatie – klinické důsledky a možnosti terapie

MUDr. Barbora Pelechová | MUDr. Šárka Malá | prof. MUDr. Milan Kvapil, CSC., MBA Interní klinika FN v Motole a 2. LF UK, Praha

- 1 Brož, J. – Honěk, P. – Dušek, L. – Pavlík, T. – Kvapil, M.: The mortality of patients with diabetes mellitus using oral antidiabetic drugs in the Czech Republic decreased over the decade of 2003-2013 and came closer to the population average. *Vnitř Lek*, 2015, 61, suppl. 3, s. 3514–20.
- 2 Tsujimoto, T. – Kajio, H. – Sugiyama, T.: Favourable changes in mortality in people with diabetes: US NHANES 1999-2010. *Diabetes Obes Metab*, 2018, 20, s. 85–93.
- 3 O'Brien, I. A. – McFadden, J. P. – Corral, R. J.: The influence of autonomic neuropathy on mortality in insulin-dependent diabetes. *Q J Med*, 1991, 79, s. 495–502.
- 4 Maser, R. E. – Lenhard, M. J.: Cardiovascular autonomic neuropathy due to diabetes mellitus: clinical manifestations, consequences, and treatment. *J Clin Endocrinol Metab*, 2005, 90, s. 5896–5903.
- 5 Spallone, V. – Ziegler, D. – Freeman, R., et al.: Cardiovascular autonomic neuropathy in diabetes: clinical impact, assessment, diagnosis, and management. *Diabetes Metab Res Rev*, 2011, 27, s. 639–653.
- 6 Callaghan, B. C. – Cheng, H. T. – Stables, C. L., et al.: Diabetic neuropathy: clinical manifestations and current treatments. *Lancet Neurol*, 2012, 11, s. 521–534.
- 7 Spallone, V. – Ziegler, D. – Freeman, R., et al.: (Toronto Consensus Panel on Diabetic Neuropathy): Cardiovascular autonomic neuropathy in diabetes: clinical impact, assessment, diagnosis, and management. *Diabetes Metab Res Rev*, 2011, 27, s. 639–653.
- 8 Spallone, V. – Bellavere, F. – Scionti, L., et al.: (Diabetic Neuropathy Study Group of the Italian Society of Diabetology): Recommendations for the use of cardiovascular tests in diagnosing diabetic autonomic neuropathy. *Nutr Metab Cardiovasc Dis*, 2011, 21, s. 69–78.
- 9 Stern, K., et al.: QT interval, corrected for heart rate, is associated with HbA<sub>1c</sub> concentration and autonomic function in diabetes. *Diabet Med*, 2016, 33, s. 1415–1421.
- 10 Kumhar, M. R. – Agarwal, T. D. – Singh, V. B., et al.: Cardiac autonomic neuropathy and its correlation with QTc dispersion in type 2 diabetes. *Indian Heart J*, 2000, 52, s. 421–426.
- 11 Pop-Busui, R.: Cardiac autonomic neuropathy in diabetes: a clinical perspective. *Diabetes Care*, 2010, 33, s. 434–441.
- 12 Ewing, D. J. – Martyn, C. N. – Young, R. J., et al.: The value of cardiovascular autonomic function tests: 10 years experience in diabetes. *Diabetes Care*, 1985, 8, s. 491–498.
- 13 Ziegler, D. – Schatz, H. – Conrad, F., et al.: Effects of treatment with the antioxidant alpha-lipoic acid on cardiac autonomic neuropathy in NIDDM patients. A 4-month randomized controlled multicenter trial (DEKAN Study). *Deutsche Kardiale Autonome Neuropathie. Diabetes Care*, 1997, 20, s. 369–373.
- 14 *Doporučený postup diagnostiky a léčby diabetické neuropatie*, 2016, dostupné z: [http://www.diab.cz/dokumenty/standardy\\_neuropatie.pdf](http://www.diab.cz/dokumenty/standardy_neuropatie.pdf), vyhledáno 8. 2. 2018.

## Nové možnosti kontinuální monitorace glykemie

MUDr. Jan Šoupal, Ph.D. | Mgr. Aneta Hásková III. interní klinika VFN a 1. LF UK, Praha

- 1 Inzucchi, S. E. – Bergenstal, R. M. – Buse, J. B., et al.: Management of hyperglycemia in type 2 diabetes, 2015: A patient-centered approach: update to a position statement of the American Diabetes Association and the European Association for the study of diabetes. *Diabetes Care*, 2015, 38, s. 140–149.
- 2 Miller, K. M. – Foster, N. C. – Beck, R. W., et al.: T1D Exchange Clinic Network. Current state of type 1 diabetes treatment in the U.S.: updated data from the T1D Exchange clinic registry. *Diabetes Care*, 2015, 38, s. 971–978.
- 3 Battelino, T. – Conget, I. – Olsen, B., et al.: SWITCH Study Group: The use and efficacy of continuous glucose monitoring in type 1 diabetes treated with insulin pump therapy: a randomised controlled trial. *Diabetologia*, 2012, 55, s. 3155–3162.
- 4 Lind, M. – Polonsky, W. – Hirsch, I. B., et al.: Continuous glucose monitoring vs conventional therapy for glycemic control in adults with type 1 diabetes treated with multiple daily insulin injections: The GOLD Randomized Clinical Trial. *JAMA*, 2017, 317, s. 379–387.
- 5 Beck, R. W. – Riddleworth, T. – Ruedy, K., et al.: DIAMOND Study Group: Effect of continuous glucose monitoring on glycemic control in adults with type 1 diabetes using insulin injections: the DIAMOND randomized clinical trial. *JAMA*, 2017, 317, s. 371–378.
- 6 Juvenile Diabetes Research Foundation Continuous Glucose Monitoring Study Group: Effectiveness of continuous glucose monitoring in a clinical care environment: evidence from the Juvenile Diabetes Research Foundation continuous glucose monitoring (JDRF-CGM) trial. *Diabetes Care*, 2010, 33, s. 17–22.
- 7 Bergenstal, R. M. – Tamborlane, W. V. – Ahmann, A., et al.: STAR 3 Study Group: Effectiveness of sensor-augmented insulin-pump therapy in type 1 diabetes. *N Engl J Med*, 2010, 363, s. 311–320.
- 8 van Beers, C. A. – DeVries, J. H., et al.: Continuous glucose monitoring for patients with type 1 diabetes and impaired awareness of hypoglycaemia (IN CONTROL): a randomised, open-label, crossover trial. *Lancet Diabetes Endocrinol*, 2016, 4, s. 893–902.
- 9 El-Laboudi, A. H. – Godtsland, I. F. – Johnston, D. G., et al.: Measures of glycemic variability in type 1 diabetes and the effect of real-time continuous glucose monitoring. *Diabetes Technol Ther*, 2016, 18, s. 806–812.
- 10 Garg, S. K. – Schwartz, S. – Edelman, S. V.: Improved glucose excursions using an implantable real-time continuous glucose sensor in adults with type 1 diabetes. *Diabetes Care*, 2004, 27, s. 734–738.
- 11 Nalysnyk, L. – Hernandez-Medina, M. – Krishnarajah, G.: Glycaemic variability and complications in patients with diabetes mellitus: evidence from a systematic review of the literature. *Diabetes Obes Metab*, 2010, 12, s. 288–298.
- 12 Bragg, J. – Adamson, U. – Backlund, L. B., et al.: Can glycaemic variability, as calculated from blood glucose self-monitoring, predict the development of complications in type 1 diabetes over a decade? *Diabetes Metab*, 2008, 34, s. 612–616.

- 13 Soupal, J. – Škrha, J. Jr. – Fajmon, M., et al.: Glycemic variability is higher in type 1 diabetes patients with microvascular complications irrespective of glycemic control. *Diabetes Technol Ther*, 2014, 16, s. 198–203.
- 14 Kropff, J. – Choudhary, P. – Neupane, S., et al.: Accuracy and longevity of an implantable continuous glucose sensor in the PRECISE study: a 180-day, prospective, multicenter, pivotal trial. *Diabetes Care*, 2017, 40, s. 63–68.
- 15 Bolinder, J. – Antuna, R. – Geelhoed-Duijvestijn, P., et al.: Novel glucose-sensing technology and hypoglycaemia in type 1 diabetes: a multicentre, non-masked, randomised controlled trial. *Lancet*, 2016, 388, s. 2254–2263.
- 16 Miller, K. M. – Beck, R. W. – Bergenstal, R. M., et al.: T1D Exchange Clinic Network: Evidence of a strong association between frequency of self-monitoring of blood glucose and hemoglobin A1c levels in T1D exchange clinic registry participants. *Diabetes Care*, 2013, 36, s. 2009–2014.
- 17 Rodbard, D.: Continuous glucose monitoring: a review of successes, challenges, and opportunities. *Diabetes Technol Ther*, 2016, 18, suppl. 2, s. S23–S213.
- 18 Bailey, T. – Bode, B. W. – Christiansen, M. P., et al.: The performance and usability of a factory-calibrated flash glucose monitoring system. *Diabetes Technol Ther*, 2015, 17, s. 787–794.
- 19 Rodbard, D.: Continuous glucose monitoring: a review of recent studies demonstrating improved glycemic outcomes. *Diabetes Technol Ther*, 2017, 19, s. S25–S37.
- 20 Prázný, M.: Selfmonitoring glykémie a přesnost glukometrů. *Interní Med*, 2013, 15, s. 206–209.
- 21 Soupal, J. – Petruželková, L. – Flekač, M., et al.: Comparison of different treatment modalities for type 1 diabetes, including sensor-augmented insulin regimens, in 52 weeks of follow-up: A COMISAIR study. *Diabetes Technol Ther*, 2016, 18, s. 532–538.
- 22 Steineck, I. – Cederholm, J. – Eliasson, B., et al.: Swedish National Diabetes Register: Insulin pump therapy, multiple daily injections, and cardiovascular mortality in 18,168 people with type 1 diabetes: observational study. *BMJ*, 2015, 350, s. 3234.

## Jakou novou kvalitou může přinést fixní kombinace bazálního inzulinového analogu a agonisty receptoru pro glucagon-like peptid-1

MUDr. Jindřich Olšovský, Ph.D. II. interní klinika LF MU a FN u sv. Anny v Brně

- 1 Inzucchi, S. E. – Bergenstal, R. M. – Buse, J. B., et al.: Management of hyperglycaemia in type 2 diabetes, 2015: a patient-centred approach. Update to a position statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetologia*, 2015, 58, s. 429–442.
- 2 Lingvay, I. – Pérez Manghi, F. – García-Hernández, P., et al.: Effect of insulin glargine up-titration vs insulin degludec/liraglutide on glycaemic hemoglobin levels in patients with uncontrolled type 2 diabetes: the DUAL V randomized clinical trial. *JAMA*, 2016, 315, s. 898–907.
- 3 DUAL VII trial (NCT02420262): Efficacy and safety of insulin degludec/liraglutide (IDegLira) versus basal–bolus (BB) therapy in patients with type 2 diabetes (T2D). ADA, 10. červen 2017, prezentace (136-OR).
- 4 Marso, S. P. – Daniels, G. H. – Brown-Frandsen, K., et al.: Liraglutide and cardiovascular outcomes in type 2 diabetes. *N Engl J Med*, 2016, 375, s. 311–322.

## Přínos telemonitoringu u pacientek s gestačním diabetem

Ing. Jiří Potůček, CSc. | Ing. Lukáš Roubík Institut pro podporu elektronizace zdravotnictví, Praha

- 1 Dumansky, V., et al.: *Atlas of the telemedicine history*. Donetsk, 2013.
- 2 European Commission: *ICT for Societal Challenges*. Luxembourg, 2012.
- 3 Ekland, A. G. – Bowes, A. – Flottorp, S.: Effectiveness of telemedicine: A systematic review of reviews. *Int J Med Inform*, 2010, 79, s. 736–771.
- 4 Metzger, B. E., et al.: Summary and recommendations of the fifth international workshop-conference on gestational diabetes mellitus. *Diabet Care*, 2007, 20, suppl. 2, s. S251–S260.
- 5 Národní strategie elektronického zdravotnictví ČR, 11. 10. 2016 schváleno ministrem zdravotnictví ČR, 28. 11. 2016 schváleno vládou ČR, www.nsez.cz.
- 6 Telemedicina mří do praxe. První zdravotní pojišťovna bude proplácet sledování zdravotního stavu na dálku. Oborová zdravotní pojišťovna, www.ozp.cz, www.diabetty.cz.
- 7 Telemonitoring InspectLife, www.inspectlife.cz.

## Potřebujeme studie z reálné klinické praxe?

MUDr. Denisa Žďárská-Janičková, Ph.D. Interní klinika 2. LF UK a FN v Motole, Praha

- 1 Krishnan, J. A. – Schatz, M. – Apter, A. J.: A call for action: comparative effectiveness research in asthma. *J Allergy Clin Immunol*, 2012, s. 123–127.
- 2 Travers, J. – Marsh, S. – Williams, M., et al.: External validity of randomised controlled trials in asthma: to whom do the results of the trials apply? *Thorax*, 2012, 67, s. 219–223.
- 3 Riegelman, R. K. (ed.): *Studying a study and testing a test: how to read the medical evidence*. 5. vydání, Lippincott Williams & Wilkins, Philadelphia.
- 4 Nallamothu, B. – Hayward, R. A. – Bates, E. R.: Beyond the randomized clinical trial: the role of effectiveness studies in evaluating cardiovascular therapies. *Circulation*, 2008, 118, s. 1294–1303.
- 5 Herland, K. – Akselsen, J.-P. – Skjongsberg, O. H., et al.: How representative are clinical study patients with asthma or COPD for a larger, real life population of patients with obstructive lung disease? *Respir Med*, 2009, 103, s. 11–19.
- 6 Costa, D. J. – Amouyal, M. – Lambert, P., et al.: Languedoc-Roussillon Teaching General Practitioners Group: How representative are clinical study patients with allergic rhinitis in primary care? *J Allergy Clin Immunol*, 2012, s. 920–926.
- 7 Roland, M. – Torgerson, D. J.: What are pragmatic trials? *BMJ*, 1998, 316, s. 285.
- 8 Compher, C.: Efficacy vs. effectiveness. *J Parenter Enteral Nutr*, 2010, 34, s. 598–599.
- 9 Stanley, K.: Design of randomized controlled trials. *Circulation*, 2007, 115, s. 1164–1169.
- 10 Price, D. – Hillyer, E. V. – van der Molen, T.: Efficacy versus effectiveness trials: informing guidelines for asthma management. *Curr Opin Allergy Clin Immunol*, 2013, 13, s. 50–57.
- 11 Ware, J. – Hamel, M. B.: Pragmatic trials – guides to better patient care? *N Engl J Med*, 2011, 364, s. 1685–1687.
- 12 Tunis, S. – Stryer, D. B. – Clancy, C. M.: Practical clinical trials: increasing the value of clinical research for decision making in clinical and health policy. *J Am Med Assoc*, 2003, 290, s. 1624–1632.
- 13 Zwarenstein, M. – Treweek, S. – Gagnier, J. J., et al.: Improving the reporting of pragmatic trials: an extension of the CONSORT statement. *BMJ*, 2008, 337, s. a2390.
- 14 Chalkidou, K. – Tunis, S. – Whicher, D., et al.: The role for pragmatic randomized controlled trials (pRCTs) in comparative effectiveness research. *Clin Trials*, 2012, 9, s. 436–446.
- 15 Saturni, S. – Bellini, F. – Braido, F., et al.: Randomized controlled trials and real-life studies. Approaches and methodologies: a clinical point of view. *Pulm Pharmacol Ther*, 2014, 27, s. 129–138.
- 16 Annemans, L. – Aristides, M. – Kubin, M.: Real-life data: a growing need. *ISPOR*, dostupné z: www.ispor.org/news/articles/oct07/rd.asp, vyhledáno 23. 1. 2018.
- 17 Concato, J.: Study design and “evidence” in patient-oriented research. *Am J Respir Crit Care Med*, 2013, 187, s. 1167–1172.
- 18 Sarrazin, M. – Rosenthal, G. E.: Finding pure and simple truths with administrative data. *J Am Med Assoc*, 2012, 307, s. 1433–1435.
- 19 Perkins, S. – Tu, W. – Underhill, M. G., et al.: The use of propensity scores in pharmacoepidemiologic research. *Pharmacoepidemiol Drug Saf*, 2000, 9, s. 93–101.
- 20 Newgard, C. – Hedges, J. R. – Arthur, M., et al.: Advanced statistics: the propensity score e a method for estimating treatment effect in observational research. *Acad Emerg Med*, 2004, 11, s. 953–961.
- 21 Rosenbaum, P. – Rubin, D. B.: The central role of the propensity score in observational studies for causal effects. *Biometrika*, 1983, 70, s. 41–55.
- 22 Rosenbaum, P. – Rubin, D. B.: Reducing bias in observational studies using subclassification on the propensity score. *J Am Stat Assoc*, 1984, 79, s. 516–524.
- 23 Kosiborod, M. – Cavender, M. A. – Fu, A. Z.: Lower risk of heart failure and death in patients initiated on SGLT2 inhibitors versus other glucose lowering drugs: The CVD-REAL Study. *Circulation*, 2017, CIRCULATIONAHA.117.029190.
- 24 Zhou, F. L., et al.: Studie Deliver 2, poster, prezentace ENDO 2017.
- 25 Riddle, M. C. – Bolli, G. B. – Yki-Järvinen, H., et al.: One-year sustained glycemic control and less hypoglycaemia with new insulin glargine 300 U/mL compared with 100 U/mL in people with type 2 diabetes using basal plus meal-time insulin: the EDITION 1 12-month randomized trial, including 6-month extension. *Diabetes Obes Metab*, 2015, DOI: 10.1111/dom.12472.
- 26 Yki-Järvinen, H. – Bergenstal, R. M. – Bolli, G. B., et al.: Less nocturnal hypoglycaemia and weight gain with new insulin glargine 300 U/mL vs. 100 U/mL: 1-year results in people with type 2 diabetes using basal insulin+OADs (EDITION 2), abstract 946. *Diabetologia*, 2015, 57, suppl. 1, s. S387.
- 27 Bolli, G. B. – Riddle, M. C. – Bergenstal, R. M., et al.: New insulin glargine 300 U/mL compared with glargine 100 U/mL in insulin-naïve people with type 2 diabetes on oral glucose-lowering drugs: a randomized controlled trial (EDITION 3). *Diabetes Obes Metab*, 2015, doi: 10.1111/dom.12438.
- 28 Ritzel, R. – Roussel, R. – Bolli, C. B., et al.: Patient-level meta-analysis of EDITION 1, 2 a 3: glycaemic control and hypoglycaemia with new insulin glargine 300 U/ml versus glargine 100 U/ml in people with type 2 diabetes. *Diabetes Obes Metab*, 2015, 17, s. 859–867.

## Léčba inhibitory DPP-4 v kombinaci s inzulinem

MUDr. Marek Honka Diabetologická a endokrinologická ambulance Lestela Hlučín, s. r. o.

- 1 Holman, R. R. – Farmer, A. J. – Davies, M. J., et al.: Three-year efficacy of complex insulin regimens in type 2 diabetes. *N Engl J Med*, 2009, 361, s. 1736–1747.
- 2 van Avendonk, M. J. – Rutten, G. E.: Insulin therapy in type 2 diabetes: what is the evidence? *Diabetes Obes Metab*, 2009, 11, s. 415–432.
- 3 Mäkimattila, S. – Nikkilä, K. – Yki-Järvinen, H.: Causes of weight gain during insulin therapy with and without metformin in patients with type II diabetes mellitus. *Diabetologia*, 1999, 42, s. 406–412.
- 4 Klein, S. – Sheard, N. F. – Pi-Sunyer, X., et al.: Weight management through lifestyle modification for the prevention and management of type 2 diabetes: rationale and strategies: a statement of the American Diabetes Association, the North American Association for the Study of Obesity, and the American Society for Clinical Nutrition. *Diabetes Care*, 2004, 27, s. 2067–2073.
- 5 Monnier, L. – Lapinski, H. – Colette, C.: Contributions of fasting and postprandial plasma glucose increments to the overall diurnal hyperglycemia of type 2 diabetic patients. *Diabetes Care*, 2003, 26, s. 881–885.
- 6 Krentz, A. J. – Patel, M. B. – Bailey, C. J.: New drugs for type 2 diabetes mellitus. What is their place in therapy? *Drugs*, 2008, 68, s. 2131–2162.
- 7 Karasik, A. – Aschner, P. – Katzeff, H., et al.: Sitagliptin, a DPP-4 inhibitor for the treatment of patients with type 2 diabetes: a review of recent clinical trials. *Curr Med Res Opin*, 2008, 24, s. 489–496.
- 8 Arnolds, A. – Dellweg, S. – Clair, J., et al.: Further improvement in



- postprandial glucose control with addition of exenatide or sitagliptin to combination therapy with insulin glargine and metformin. *Diabetes Care*, 2010, 33, s. 1509–1515.
- Barnett, A. H. – Charbonnel, B. – Donovan, M., et al.: Effect of saxagliptin as add-on therapy in patients with poorly controlled type 2 diabetes on insulin alone or insulin combined with metformin. *Curr Med Res Opin*, 2012, 28, s. 513–523.
  - VilSBøll, T. – Rosenstock, J. – Yki-Järvinen, H., et al.: Efficacy and safety of sitagliptin when added to insulin therapy in patients with type 2 diabetes. *Diabetes Obes Metab*, 2010, 12, s. 167–177.
  - Fonseca, V. – Schweizer, A. – Albrecht, D., et al.: Addition of vildagliptin to insulin improves glycaemic control in type 2 diabetes. *Diabetologia*, 2007, 50, s. 1148–1155.
  - Rosenstock, J. – Rendell, M. S. – Gross, J. L., et al.: Alogliptin added to insulin therapy in patients with type 2 diabetes reduces HbA<sub>1c</sub> without causing weight gain or increased hypoglycaemia. *Diabetes Obes Metab*, 2009, 11, s. 1145–1152.
  - Yki-Järvinen, H. – Rosenstock, J. – Durán-García, S., et al.: Effects of adding linagliptin to basal insulin regimen for inadequately controlled type 2 diabetes. *Diabetes Care*, 2013, 36, s. 3875–3881.
  - Xu, L. – Dalla Man, C. – Charbonnel, B., et al.: Effect of sitagliptin, a dipeptidyl peptidase-4 inhibitor, on beta-cell function in patients with type 2 diabetes: a model-based approach. *Diabetes Obes Metab*, 2008, 10, s. 1212–1220.
  - Brazg, R. – Xu, L. – Dalla Man, C., et al.: Effect of adding sitagliptin, a dipeptidyl peptidase-4 inhibitor, to metformin on 24-h glycaemic control and beta-cell function in patients with type 2 diabetes. *Diabetes Obes Metab*, 2007, 9, s. 186–193.
  - Ahren, B. – Schweizer, A. – Dejager, S., et al.: Vildagliptin enhances islet responsiveness to both hyper- and hypoglycemia in patients with type 2 diabetes. *J Clin Endocrinol Metab*, 2009, 94, s. 1236–1243.

## iGlarLixi (Suliqua) – nová fixní kombinace inzulínu glargin a lixisenatidu – lékový profil

MUDr. Jiří Slíva, Ph.D. Ústav farmakologie 3. LF UK, Praha

- Valentine, V. – Goldman, J. – Shubrook, J. H.: Rationale for initiation and titration of the basal insulin/GLP-1RA fixed-ratio combination products, IDegLira and iGlarLixi, for the management of type 2 diabetes. *Diabetes Ther*, 2017, 8, s. 739–752.
- Aroda, V. R. – Rosenstock, J. – Wysham, C., et al.: Efficacy and safety of LixiLan, a titratable fixed-ratio combination of insulin glargine plus lixisenatide in type 2 diabetes inadequately controlled on basal insulin and metformin: The LixiLan-L randomized trial. *Diabetes Care*, 2016, 39, s. 1972–1980.
- Rosenstock, J. – Aronson, R. – Grunberger, G., et al.: Benefits of LixiLan, a titratable fixed-ratio combination of insulin glargine plus lixisenatide, versus insulin glargine and lixisenatide monocomponents in type 2 diabetes inadequately controlled on oral agents: The LixiLan-O randomized trial. *Diabetes Care*, 2016, 39, s. 2026–2035.

## Možnosti intenzifikace léčby bazálním inzulínem

MUDr. Denisa Žďárská-Janíčková, Ph.D. Interní klinika 2. LF UK a FN v Motole, Praha

- Riddle, C. M.: Basal glucose can be controlled but the prandial problem persists – it is the next target. *Diabetes Care*, 2017, 40, s. 291–300.
- Monnier, L. – Colette, C. – Boniface, H.: Contribution of postprandial glucose to chronic hyperglycaemia: from the „glucose triad“ to the trilogy of „sevens“. *Diabetes Metab*, 2006, 32, s. S11–16.
- Monnier, L. – Lapinski, H. – Colette, C.: Contributions of fasting and postprandial plasma glucose increments to the overall diurnal hyperglycemia of type 2 diabetic patients: variations with increasing levels of HbA<sub>1c</sub>. *Diabetes Care*, 2003, 26, s. 881–885.
- Inzucchi, S. E. – Bergenstal, R. M. – Buse, J. B., et al.: Management of hyperglycemia in type 2 diabetes, 2015: a patient-centered approach: update to a position statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetes Care*, 2015, 38, s. 140–149.
- Riddle, M. – Umpierrez, G. – DiGenio, A., et al.: Contributions of basal and postprandial hyperglycemia over a wide range of A1C levels before and after treatment intensification in type 2 diabetes. *Diabetes Care*, 2011, 34, s. 2508–2514.
- American Diabetes Association. Standards of medical care in diabetes-2017. *Diabetes Care*, 2017, 40, suppl. 1, s. S1–S2, DOI: 10.2337/dc17-S001
- Holst, J. J. – VilSBøll, T.: Combining GLP-1 receptor agonists with insulin: therapeutic rationales and clinical findings. *Diabetes Obes Metab*, 2013, 15, s. 3–14.
- Balena, R. – Hensley, I. E. – Miller, S., et al.: Combination therapy with GLP-1 receptor agonists and basal insulin: a systematic review of the literature. *Diabetes Obes Metab*, 2013, 15, s. 485–502.
- Vora, J.: Combining incretin-based therapies with insulin. Realizing the potential in type 2 diabetes. *Diabetes Care*, 2013, 36, suppl. 2, s. S226–232.
- Vora, J. – Bain, S. C. – Damci, T., et al.: Incretin-based therapy in combination with basal insulin: a promising tactic for the treatment of type 2 diabetes. *Diabetes Metab*, 2013, 39, s. 6–15.
- Carris, N. W. – Taylor, J. R. – Gums, J. G.: Combining a GLP-1 receptor agonist and basal insulin: study evidence and practical considerations. *Drugs*, 2014, 74, s. 2141–2152.
- Tibaldi, J.: Achieving glycaemic goals with addition of incretin-based therapies to insulin in patients with type 2 diabetes mellitus. *Am J Med Sci*, 2014, 347, s. 491–501.
- Raccach, D. – Lin, J. – Wang, E., et al.: Once-daily prandial lixisenatide versus once-daily rapid-acting insulin in patients with type 2 diabetes mellitus insufficiently controlled with basal insulin: analysis of data from five randomized, controlled trials. *J Diabetes Complications*, 2014, 28, s. 40–44.
- Raccach, D.: Basal insulin treatment intensification in patients with type 2 diabetes mellitus: A comprehensive systematic review of current options. *Diabetes Metab*, 2017, 43, s. 110–124.
- Miao, R. – Wei, W. – Baser, O., et al.: Real world outcomes of adding rapid-acting insulin versus switching to analog premix insulin among US patients with type 2 diabetes treated with insulin glargine. *Patient Prefer Adherence*, 2013, 7, s. 951–960.
- Peyrot, M. – Barnett, A. H. – Meneghini, L. F., et al.: Factors associated with injection omission/non-adherence in the Global Attitudes of Patients and Physicians in Insulin Therapy study. *Diabetes Obes Metab*, 2012, 14, s. 1081–1087.
- Raccach, D. – Bretzel, R. G. – Owens, D., et al.: When basal insulin therapy in type 2 diabetes mellitus is not enough: what next? *Diabetes Metab Res Rev*, 2007, 23, s. 257–264.
- Darmon, P. – Raccach, D.: Options for intensification of basal insulin in type 2 diabetes: Premeal insulin or short-acting GLP-1 receptor agonists? *Diabetes Metab*, 2015, s. 6521–6527.
- Holst, J. J. – VilSBøll, T.: Combining GLP-1 receptor agonists with insulin: therapeutic rationales and clinical findings. *Diabetes Obes Metab*, 2013, 15, s. 3–14.
- Raccach, D. – Chou, E. – Colagiuri, S., et al.: A global study of unmet need for glycaemic control and predictor factors among patients with type 2 diabetes mellitus on basal insulin. *Diabetologia*, 2014, 51, s. 438.
- Tran, L. K. – Park, Y. I. – Pandya, S., et al.: Overview of Glucagon-like peptide-1 receptor agonists for the treatment of patients with type 2 diabetes. *Am Health Drug Benefits*, 2017, 10, s. 178–188.
- Meier, J. J. – Rosenstock, J. – Hincelin-Méry, A., et al.: Contrasting effects of lixisenatide and liraglutide on postprandial glycaemic control, gastric emptying, and safety parameters in patients with type 2 diabetes on optimized insulin glargine with or without metformin: a randomized, open-label trial. *Diabetes Care*, 2015, 38, s. 1263–1273.
- Meier, J. J. – Rosenstock, J. – Hincelin-Méry, A., et al.: Effect of lixisenatide vs liraglutide on glycaemic control, gastric emptying, and safety parameters in optimized insulin glargine T2DM ± metformin. *Diabetes*, 2014, 63, s. 1017–1019.
- Buse, J. B. – VilSBøll, T. – Thurman, J., et al.: Contribution of liraglutide in the fixed-ratio combination of insulin degludec and liraglutide (IDegLira). *Diabetes Care*, 2014, 37, s. 2926–2933.
- Buse, J. B. – Rodbard, H. W. – Woo, V. C., et al.: Impact of BMI on HbA<sub>1c</sub> reduction, hypoglycemia rates, and insulin requirements in response to IDegLira in patients with type 2 diabetes (T2D). *Diabetes*, 2014, 63, s. A18.
- Rosenstock, J. – Diamant, M. – Silvestre, L., et al.: Benefits of a fixed-ratio formulation of once-daily insulin glargine/lixisenatide (LixiLan) vs glargine in type 2 diabetes inadequately controlled on metformin. *Diabetologia*, 2014, 57, s. 108.
- Rosenstock, J. – Wysham, C. – Unger, J., et al.: Efficacy and safety of LixiLan, a titratable fixed-ratio combination of insulin glargine plus lixisenatide in type 2 diabetes inadequately controlled on basal insulin and metformin: The LixiLan-L randomized trial. *Diabetes Care*, 2016, 39, s. 1972–1980.
- Seaquist, E. – Rosenstock, J. – Gavin, J. R., et al.: Changing the type 2 diabetes mellitus management paradigm with fixed-ratio combination. *EMJ Diabet*, 2017, 5, s. 46–55.
- Cai, X. – Gao, X. – Yang, V., et al.: Comparison between insulin degludec/liraglutide treatment and insulin glargine/lixisenatide treatment in type 2 diabetes: a systematic review and meta-analysis. *Expert Opin Pharmacother*, 2017, DOI: 10.1080/14656566.2017.1400011.

## Berberin

MUDr. Barbora Nussbaumerová, Ph.D. Centrum preventivní kardiologie, II. interní klinika LF a FN v Plzni, UK v Praze

- Janský, P., et al.: 2016 ESC/EAS Guidelines for the management of dyslipidaemias: Summary of the document prepared by the Czech Society of Cardiology. *Cor et Vasa*, 2017, 59, s. e389–e415, dostupné z: <http://www.sciencedirect.com/science/article/pii/S0010865017300371>.
- Semwal, R. B. – Semwal, D. P. – Kapoor, P.: Dyeing properties of Berberis aristata DC with natural and synthetic mordants. *Trends In Applied Sciences Research*, 2012, 7, s. 392–399, doi: 10.3923/tasr.2012.392.399.
- Phillipson, J. D. – Roberts, M. F. – Zenk, M. H.: *The chemistry and biology of isoquinoline alkaloids*. 1985, s. 81–86. Springer Verlag, Berlin.
- Coughlan, K. A. – Valentine, R. J. – Ruderman, N. B., et al.: AMPK activation: a therapeutic target for type 2 diabetes? *Diabetes Metab Syndr Obes*, 2014, 7, s. 241–253.
- Dong, Y. – Chen, Y. T. – Yang, Y. X., et al.: Metabolomics study of type 2 diabetes mellitus and the anti-diabetic effect of berberine in Zucker Diabetic Fatty Rats using Uplc-ESI-Hdms. *Phytother Res*, 2016, 30, s. 823–828, doi: 10.1002/ptr.5587, Epub 16. 2. 2016.
- Kong, W. – Wei, J. – Abidi, P., et al.: Berberine is a novel cholesterol lowering drug working through a unique mechanism distinct from statins. *Nat Med*, 2004, 10, s. 1344–1351.
- Chandrasegaran, G. – Elanchezhian, C. – Ghosh, K.: Effects of Berberine chloride on the liver of streptozotocin-induced diabetes in albino Wistar rats. *Biomed Pharmacother*, 2018, 99, s. 227–236, doi: 10.1016/j.biopha.2018.01.007, Epub před tiskem.
- Liu, D. – Zhang, Y. – Liu, Y.: Berberine modulates gut microbiota and reduces insulin resistance via the TLR4 signaling pathway. *Exp Clin Endocrinol Diabetes*, 24. 1. 2018, doi: 10.1055/s-0043-125066, Epub před tiskem.
- Derosa, G. – Romano, D. – D'Angelo, A.: Berberis aristata combined with Silybum marianum on lipid profile in patients not tolerating statins at high doses. *Atherosclerosis*, 2015, 239, s. 87–92, doi: 10.1016/j.atherosclerosis.2014.12.043, Epub 24. 12. 2014.
- Derosa, G. – Bonaventura, A. – Bianchi, L., et al.: Effects of Berberis aristata/Silybum marianum association on metabolic parameters and adipocytokines in overweight dyslipidemic patients. *J Biol Regul Homeost Agents*, 2013, 27, s. 717–728.
- Derosa, G. – D'Angelo, A. – Romano, D., et al.: Effects of a combination of Berberis aristata, Silybum marianum and monacolin on lipid profile in subjects at low cardiovascular risk: a double-blind, randomized, placebo-controlled trial. *Int J Mol Sci*, 2017, 18, s. 343. Publikováno online 7. 2. 2017, doi: 10.3390/ijms18020343.
- Di Pierro, F. – Putignano, P. – Villanova, N.: Retrospective analysis of the effects of a highly standardized mixture of Berberis aristata, Silybum marianum, and monacolins K and KA in diabetic patients with dyslipidemia. *Acta Biomed*, 2018, 88, s. 462–469, doi: 10.23750/abm.v88i4.5851.
- Izzo, R. – de Simone, G. – Giudice, R., et al.: Effects of nutraceuticals

- on prevalence of metabolic syndrome and on calculated Framingham Risk Score in individuals with dyslipidemia. *J Hypertens*, 2010, 28, s. 1482–1487, doi: 10.1097/HJH.0b013e3283395208.
- 14 **Ruscica, M. – Gomasarachi, M. – Mombelli, G., et al.:** Nutraceutical approach to moderate cardiometabolic risk: results of a randomized, double-blind and crossover study with Armolipid Plus. *J Clin Lipidol*, 2014, 8, s. 61–68, doi: 10.1016/j.jacl.2013.11.003, Epub 11. 11. 2013.
- 15 **Affuso, F. – Ruvolo, A. – Micillo, F., et al.:** Effects of a nutraceutical combination (berberine, red yeast rice and policosanols) on lipid levels and endothelial function randomized, double-blind, placebo-controlled study. *Nutr Metab Cardiovasc Dis*, 2010, 20, s. 656–661, doi: 10.1016/j.numecd.2009.05.017, Epub 20. 8. 2009.
- 16 **Pisciotta, L. – Bellocchio, A. – Bertolini, S.:** Nutraceutical pill containing berberine versus ezetimibe on plasma lipid pattern in hypercholesterolemic subjects and its additive effect in patients with familial hypercholesterolemia on stable cholesterol-lowering treatment. *Lipids Health Dis*, 2012, 11, s. 123, doi: 10.1186/1476-511X-11-123.
- 17 **Lan, J. – Zhao, Y. – Dong, F., et al.:** Meta-analysis of the effect and safety of berberine in the treatment of type 2 diabetes mellitus, hyperlipemia and hypertension. *J Ethnopharmacol*, 2015, 161, s. 69–81, doi: 10.1016/j.jep.2014.09.049.
- 18 **Kong, W. J. – Wei, J. – Zuo, Z. Y., et al.:** Combination of simvastatin with berberine improves the lipid-lowering efficacy. *Metabolism*, 2008, 57, s. 1029–1037.
- 19 **Rozza, F. – de Simone, G. – Izzo, R., et al.:** Nutraceuticals for treatment of high blood pressure values in patients with metabolic syndrome. *High Blood Press Cardiovasc Prev*, 2009, 16, s. 177–182, doi: 10.2165/11530420-000000000-00000, Epub 3. 1. 2013.
- 20 **Konrath, E. L. – Passos, C. D. S. – Klein-Júnior, L. C., et al.:** Alkaloids as a source of potential anticholinesterase inhibitors for the treatment of Alzheimer's disease. *J Pharm Pharmacol*, 2013, 65, s. 1701–1725.
- 21 **Xie, J. – Xu, Y. – Huang, X., et al.:** Berberine-induced apoptosis in human breast cancer cells is mediated by reactive oxygen species generation and mitochondrial-related apoptotic pathway. *Tumour Biol*, 2015, 36, s. 1279–1288.
- 22 **Wang, Y. – Liu, Q. – Liu, Z., et al.:** Berberine, a genotoxic alkaloid, induces ATM-Chk1 mediated G2 arrest in prostate cancer cells. *Mutat Res*, 2012, 734, s. 20–29.
- 23 **Liu, J. – Zhang, X. – Liu, A., et al.:** Berberine induces apoptosis in p53-null leukemia cells by down-regulating XIAP at the post-transcriptional level. *Cell Physiol Biochem*, 2013, 32, s. 1213–1224.

## Trapiby a HDL-hypotéza: otevřený příběh

MUDr. Michaela Šnejdrová, Ph.D. | prof. MUDr. Richard Češka, CSc. Centrum preventivní kardiologie, III. interní klinika endokrinologie a metabolismu VFN a 1. LF UK, Praha

- 1 **Wiviott, S. D. – Braunwald, E. – McCabe, C. H., et al.:** TRITON-TIMI 38 Investigators: Prasugrel versus clopidogrel in patients with acute coronary syndromes. *N Engl J Med*, 2007, 357, s. 2001–2015.
- 2 **Wallentin, L. – Becker, R. C. – Budaj, A., et al.:** PLATO Investigators: Ticagrelor versus clopidogrel in patients with acute coronary syndromes. *N Engl J Med*, 2009, 361, s. 1045–1057.
- 3 **Ray, K. K. – Cannon, C. P. – McCabe, C. H., et al.:** PROVE IT-TIMI 22 Investigators: Early and late benefit of high dose atorvastatin in patients with acute coronary syndromes: results from the PROVE IT-TIMI 22 trial. *J Am Coll Cardiol*, 2005, 46, s. 1405–1410.
- 4 **Ahmed, S. – Cannon, C. P. – Murphy, S. A., et al.:** Acute coronary syndromes and diabetes: is intensive lipid lowering beneficial? Results of the PROVE IT-TIMI 22 trial. *Eur Heart J*, 2006, 27, s. 2323–2329.
- 5 **Deedwania, P. – Barter, P. – Carmena, R., et al.:** Treating to New Targets Investigators: Reduction of low-density lipoprotein cholesterol in patients with coronary heart disease and metabolic syndrome: analysis of the Treating to New Targets study. *Lancet*, 2006, 368, s. 919–928.
- 6 **Koizumi, J. – Mabuchi, H. – Yoshimura, A., et al.:** Deficiency of serum cholesteryl-ester transfer activity in patients with familial hyperalphalipoproteinaemia. *Atherosclerosis*, 1985, 58, s. 175–186.
- 7 **Inazu, A. – Brown, M. L. – Hesler, C. B., et al.:** Increased high-density lipoprotein levels caused by a common cholesteryl-ester transfer protein gene mutation. *N Engl J Med*, 1990, 323, s. 1234–1238.
- 8 **Brousseau, M. E. – Schaefer, E. J. – Wolfe, M. L., et al.:** Effects of an inhibitor of cholesteryl ester transfer protein on HDL cholesterol. *N Engl J Med*, 2004, 350, s. 1505–1515.
- 9 **Clark, R. W. – Sutfin, T. A. – Ruggeri, R. B., et al.:** Raising high-density lipoprotein in humus through inhibition of cholesteryl ester transfer protein: an initial multidose study of torcetrapib. *Arterioscler Thromb Vasc Biol*, 2004, 24, s. 490–497.
- 10 **Barter, P. J. – Caulfield, M. – Eriksson, M., et al.:** ILLUMINATE Investigators: Effects of torcetrapib in patients at high risk for coronary events. *N Engl J Med*, 2007, 357, s. 2109–2122.
- 11 **Schwartz, G. G. – Olsson, A. G. – Abt, M., et al.:** Dal-OUTCOMES Investigators: Effects of dalcetrapib in patients with a recent acute coronary syndrome. *N Engl J Med*, 2012, 367, s. 2089–2099.
- 12 **The HPS3/TIMI55-REVEAL Collaborative Group:** Effect of anacetrapib in patients with atherosclerotic vascular disease. *N Engl J Med*, 2017, 377, s. 1217–1227.

# Glifloziny – naděje pro diabetiky s kardiovaskulárním onemocněním

prof. MUDr. Jiří Vítovec, CSc., FESC I. interní kardiologická klinika LF MU a FN u sv. Anny v Brně

prof. MUDr. Jindřich Špinar, CSc., FESC Interní kardiologická klinika FN Brno

prof. MUDr. Lenka Špinarová, Ph.D., FESC I. interní kardiologická klinika LF MU a FN u sv. Anny v Brně

- 1 Ferrannini, E. – Muscelli, E. – Frascerra, S., et al.: Metabolic response to sodium-glucose cotransporter 2 inhibition in type 2 diabetic patients. *J Clin Invest*, 2014, 124, s. 499–508.
- 2 Hummel, C. S. – Lu, C. – Loo, D. D., et al.: Glucose transport by human renal Na<sup>+</sup>/D-glucose cotransporters SGLT1 SGLT2. *Am J Physiol*, 2011, 300, s. C14–C20.
- 3 Prázný, M. – Soupal, J.: Postavení nových antidiabetik v klinické praxi: SGLT2 vs. DPP4 inhibitory. *Vnitř Lék*, 2015, 61, s. 291–294.
- 4 Sattar, N. – Petrie, M. C. – Zinnad, B., et al.: Novel diabetes drugs and the cardiovascular specialist. *J Am Coll Cardiol*, 2017, 69, s. 2646–2656.
- 5 Zinman, B. – Wanner, C. H. – Lachin, J. M., et al., for the EMPA-REG OUTCOME Investigators: Empagliflozin, cardiovascular outcomes, and mortality in type 2 diabetes. *N Engl J Med*, 2015, 373, s. 2117–2128.
- 6 Špinar, J. – Hradec, J. – Špinarová, L. – Vítovec, J.: Summary of the 2016 ESC Guidelines on the diagnosis and treatment of acute and chronic heart failure. Prepared by the Czech Society of Cardiology. *Cor Vasa*, 2016, 58, s. 530–568.
- 7 Langkilde, A. M. – Johansson, P. – Ptaszynska, A., et al.: Cardiovascular safety of the SGLT2 inhibitor dapagliflozin: meta-analysis with > 6000 patient-years exposure. 2013, AHA Scientific Sessions, abstrakt 11105.
- 8 Sonesson, C. – Johansson, P. A. – Johnsson, E., et al.: Cardiovascular effects of dapagliflozin in patients with type 2 diabetes and different risk categories: a meta-analysis. *Cardiovasc Diabetol*, 2016, 15, s. 37, doi:10.1186/s12933-016-0356-y.
- 9 Špinar J. – Lábrová, R.: Dapagliflozin a studie DECLARE – budoucnost léčby diabetes mellitus. *Kardiol Rev Int Med*, 2016, 18, s. 1–6.

# Inhibitory DPP-4 a agonisté receptoru pro GLP-1 se nevzdávají

prof. MUDr. Milan Kvapil, CSc., MBA Interní klinika FN v Motole a 2. LF UK, Praha

- 1 Haffner, S. M. – Lehto, S. – Rönnemaa, T., et al.: Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. *N Engl J Med*, 1998, 339, s. 229–234.
- 2 Collins, R. – Armitage, J. – Parish, S., et al.: Heart Protection Study Collaborative Group. MRC/BHF Heart Protection Study of cholesterol-lowering with simvastatin in 5963 people with diabetes: a randomised placebo-controlled trial. *Lancet*, 2003, 361, s. 2005–2016.
- 3 Green, J. B. – Bethel, M. A. – Armstrong, P. W., et al.: TECOS Study Group: Effect of sitagliptin on cardiovascular outcomes in type 2 diabetes. *N Engl J Med*, 2015, 373, s. 232–242.
- 4 White, W. B. – Cannon, C. P. – Heller, S. R., et al.; EXAMINE Investigators: Alogliptin after acute coronary syndrome in patients with type 2 diabetes. *N Engl J Med*, 2013, 369, s. 1327–1335.
- 5 Scirica, B. M. – Bhatt, D. L. – Braunwald, E., et al.; SAVOR-TIMI 53 Steering Committee and Investigators: Saxagliptin and cardiovascular outcomes in patients with type 2 diabetes mellitus. *N Engl J Med*, 2013, 369, s. 1317–1326.
- 6 Williams, R. – de Vries, F. – Kothny, W., et al.: Cardiovascular safety of vildagliptin in patients with type 2 diabetes: A European multi-database, non-interventional post-authorization safety study. *Diabetes Obes Metab*, 2017, 19, s. 1473–1478.
- 7 Pfeffer, M. A. – Claggett, B. – Diaz, R., et al.; ELIXA Investigators: Lixisenatide in patients with type 2 diabetes and acute coronary syndrome. *N Engl J Med*, 2015, 373, s. 2247–2257.
- 8 Marso, S. P. – Daniels, G. H. – Brown-Frandsen, K., et al.; LEADER Steering Committee; LEADER Trial Investigators: Liraglutide and cardiovascular outcomes in type 2 diabetes. *N Engl J Med*, 2016, 375, s. 311–322.
- 9 Holman, R. R. – Bethel, M. A. – Mentz, R. J., et al.; EXSCLE Study Group: Effects of once-weekly exenatide on cardiovascular outcomes in type 2 diabetes. *N Engl J Med*, 2017, 377, s. 1228–1239.
- 10 Zinman, B. – Wanner, C. – Lachin, J. M., et al.; EMPA-REG OUTCOME Investigators: Empagliflozin, cardiovascular outcomes, and mortality in type 2 diabetes. *N Engl J Med*, 2015, 373, s. 2117–2128.
- 11 Dostupné z: <https://www.easd.org/virtualmeeting/home.html#resources/introduction-and-context>, vyhledáno 19. 1. 2018.
- 12 Olesen, K. K. W. – Madsen, M. – Egholm, G., et al.: Patients with diabetes without significant angiographic coronary artery disease have the same risk of myocardial infarction as patients without diabetes in a real-world population receiving appropriate prophylactic treatment. *Diabetes Care*, 2017, 40, s. 1103–1110.
- 13 Tsujimoto, T. – Kajio, H. – Sugiyama, T.: Favourable changes in mortality in people with diabetes: US NHANES 1999–2010. *Diabetes Obes Metab*, 2018, 20, s. 85–93.
- 14 Brož, J. – Honěk, P. – Dušek, L. – Pavlík, T. – Kvapil, M.: The mortality of patients with diabetes mellitus using oral antidiabetic drugs in the Czech Republic decreased over the decade of 2003–2013 and came closer to the population average. *Vnitř Lék*, 2015, 61, suppl. 3, s. S14–S20.
- 15 Lee, W.-Y.: Brief review of articles in Endocrinology and Metabolism in 2013. *Endocrinol Metab*, 2014, 29, s. 251–256.

# Bude inclisiran ještě účinnější na kardiovaskulární příhody než monoklonální protilátky proti PCSK9?

prof. MUDr. Vladimír Blaha, CSc. III. interní gerontometabolická klinika LF UK a FN Hradec Králové

- 1 Catapano, A. L. – Graham, I. – De Backer, G., et al.: 2016 ESC/EAS Guidelines for the management of dyslipidaemias. *Eur Heart J*, 2016, 37, s. 2999–3058.
- 2 Barkas, F. – Liberopoulos, E. N. – Kostapanos, M. S., et al.: Lipid target achievement among patients with very high and high cardiovascular risk in a lipid clinic. *Angiology*, 2015, 66, s. 346–353.
- 3 Jones, P. H. – Nair, R. – Thakker, K. M.: Prevalence of dyslipidemia and lipid goal attainment in statin-treated subjects from 3 data sources: a retrospective analysis. *J Am Heart Assoc*, 2012, 1, s. e001800.
- 4 Hooper, A. J. – Burnett, J. R.: Anti-PCSK9 therapies for the treatment of hypercholesterolemia. *Expert Opin Biol Ther*, 2013, 13, s. 429–435.
- 5 Lakoski, S. G. – Lagace, T. A. – Cohen, J. C., et al.: Genetic and metabolic determinants of plasma PCSK9 levels. *J Clin Endocrinol Metab*, 2009, 94, s. 2537–2543.
- 6 Abifadel, M. – Varret, M. – Rabes, J. P., et al.: Mutations in PCSK9 cause autosomal dominant hypercholesterolemia. *Nat Genet*, 2003, 34, s. 154–156, doi:10.1038/ng1161.
- 7 Lagace, T. A. – Curtis, D. E. – Garuti, R., et al.: Secreted PCSK9 decreases the number of LDL receptors in hepatocytes and in livers of parabiotic mice. *J Clin Invest*, 2006, 116, s. 2995–3005, doi: 10.1172/JCI29383.
- 8 Sabatine, M. S. – Giugliano, R. P. – Wiviott, S. D., et al.; Open-Label Study of Long-Term Evaluation against LDL Cholesterol (OSLER) Investigators: Efficacy and safety of evolocumab in reducing lipids and cardiovascular events. *N Engl J Med*, 2015, 372, s. 1500–1509, doi: 10.1056/NEJMoa1500858.
- 9 Robinson, J. G. – Farnier, M. – Krempf, M., et al.; ODYSSEY LONG TERM Investigators: Efficacy and safety of alirocumab in reducing lipids and cardiovascular events. *N Engl J Med*, 2015, 372, s. 1489–1499, doi: 10.1056/NEJMoa1501031.
- 10 Sabatine, M. S. – Giugliano, R. P., et al.: Evolocumab and clinical outcomes in patients with cardiovascular disease. *N Engl J Med*, 2017, 376, s. 1713–1722, doi: 10.1056/NEJMoa1615664.
- 11 Fitzgerald, K. – White, S. – Borodovsky, A., et al.: A highly durable RNAi therapeutic inhibitor of PCSK9. *N Engl J Med*, 2017, 376, s. 41–51, doi: 10.1056/NEJMoa1609243.
- 12 Khvorova, A.: Oligonucleotide therapeutics – a new class of cholesterol-lowering drugs. *N Engl J Med*, 2017, 376, s. 4–7, doi: 10.1056/NEJMp1614154.
- 13 Rashid, S. – Curtis, D. E. – Garuti, R., et al.: Decreased plasma cholesterol and hypersensitivity to statins in mice lacking PCSK9. *Proc Natl Acad Sci USA*, 2005, 102, s. 5374–5379, doi: 10.1073/pnas.0501652102.
- 14 Wang, N. – Tall, A. R.: A new approach to PCSK9 therapeutics. *Circ Res*, 2017, 120, s. 1063–1065.
- 15 Nair, J. K. – Willoughby, J. L. – Chan, A., et al.: Multivalent N-acetylglucosamine – conjugated siRNA localizes in hepatocytes and elicits robust RNAi – mediated gene silencing. *J Am Chem Soc*, 2014, 136, s. 16958–16961, doi:10.1021/ja505986a.
- 16 Zaid, A. – Roubtsova, A. – Essalmari, R., et al.: Proprotein convertase subtilisin/kexin type 9 (PCSK9): hepatocyte-specific low-density lipoprotein receptor degradation and critical role in mouse liver regeneration. *Hepatology*, 2008, 48, s. 646–654, doi:10.1002/hep.22354.
- 17 Ray, K. R. – Landmesser, U. – Leiter, L. A., et al.: Inclisiran in patients at high cardiovascular risk with elevated LDL cholesterol. *N Engl J Med*, 2017, 376, s. 1430–1440.

# Metoprolol – význam lékové formy pro dosažení optimálního efektu

prof. MUDr. Jan Bultas, CSc. Farmakologický ústav 3. LF UK, Praha

- 1 Dostupné z: [http://www.kardio-cz.cz/data/upload/doporucene\\_postupy/2016/Doporucene\\_postupy\\_pro\\_diagnostiku\\_a\\_lecbu\\_akutního\\_a\\_chronického\\_srdcečního\\_selhání\\_2016.pdf](http://www.kardio-cz.cz/data/upload/doporucene_postupy/2016/Doporucene_postupy_pro_diagnostiku_a_lecbu_akutního_a_chronického_srdcečního_selhání_2016.pdf), vyhledáno 1. 4. 2018.
- 2 Buzková, H. – Pechandová, K. – Slanař, O., et al.: Frequency of single nucleotide polymorphisms of CYP2D6 in the Czech population. *Cell Biochem Funct*, 2008, 26, s. 76–81.
- 3 Law, M. R. – Morris, J. K. – Wald, N. J.: Use of blood pressure lowering drugs in the prevention of cardiovascular disease: meta-analysis of 147 randomised trials in the context of expectations from prospective epidemiological studies. *BMJ*, 2009, 338, b1665.
- 4 Molden, E. – Spigset, O.: Interactions between metoprolol and antidepressants. *Tidsskr Nor Lægeforen*, 2011, 131, s. 1777–1779.
- 5 Fukumoto, K. – Kobayashi, T. – Tachibana, K., et al.: Effect of amiodarone on the serum concentration/dose ratio of metoprolol in patients with cardiac arrhythmia. *Drug Metab Pharmacokin*, 2006, 21, s. 501–505.
- 6 Silas, J. H. – Freestone, S. – Lennard, M. S., et al.: Comparison of two slow-release formulations of metoprolol with conventional metoprolol and atenolol in hypertensive patients. *Br J Clin Pharmacol*, 1985, 20, s. 387–399.
- 7 Theeuwes, E. – Swanson, D. R. – Guttard, G., et al.: Osmotic delivery systems for the P-adrenoceptor agonists metoprolol and exprenolol design and evaluation of system for once daily administration. *Br J Clin Pharmacol*, 1987, 19, s. 695–765.
- 8 Kendall, M. J.: Metoprolol-controlled release. Zero Order Kinetics. *J Clin Pharm Ther*, 1989, 14, s. 159–179.
- 9 Blake, C. M. – Kharasch, E. D. – Schwab, M., et al.: A meta-analysis of CYP2D6 metabolizer phenotype and metoprolol pharmacokinetics. *Clin Pharmacol Ther*, 2013, 94, s. 394–399.



# Fixní kombinace perindopril argininu s amlodipinem: klinické zkušenosti

prof. MUDr. Jiří Widimský jr., CSc. III. interní klinika – Centrum pro hypertenzi VFN a 1. LF UK, Praha

- Todd, P. A. – Fitton, A.: Perindopril. A review of its pharmacological properties and therapeutic use in cardiovascular disorders. *Drugs*, 1991, 42, s. 90–114.
- Grundmann, M.: Perindopril arginin – nová sůl inhibitoru ACE perindoprilu. *Farmakoterapie*, 2007, 3, s. 308–312.
- Abernethy, D. R.: The pharmacokinetic profile of amlodipine. *Am Heart J*, 1989, 118, s. 1100–1103.
- Widimský, J. jr. – Cífková, R. – Špinar, J., et al.: Doporučení diagnostických a léčebných postupů arteriální hypertenze – verze 2007. Doporučení České společnosti pro hypertenzi. *Cor et Vasa*, 2008, 1, s. K3–23.
- Brugts, J. J., et al.: The consistency of the treatment effect of an angiotensin-converting enzyme-inhibitor-based treatment regimen in patients with vascular disease or high risk of vascular disease: a combined analysis of individual data of ADVANCE, EUROPA, and PROGRESS trials comparing perindopril–indapamide vs. placebo. *Eur Heart J*, 2009, 30, s. 1385–1394.
- 2007 Guidelines for the management of arterial hypertension. The task force for the management of arterial hypertension of the European Society of Hypertension and of the European Society of Cardiology. *Guidelines Committee. J Hypertens*, 2007, 25, s. 1105–1187.
- Remuzzi, G. – Macia, M. – Ruggenenti, P.: Prevention and treatment of diabetic renal disease in type 2 diabetes: the BENEDICT study. *J Am Soc Nephrol*, 2006, 17, suppl. 2, s. S90–S97.
- Yusuf, S. – Sleight, P. – Pogue, J., et al.: for The Heart Outcomes Prevention Evaluation study investigators: Effects of an angiotensin converting-enzyme inhibitor, ramipril, on cardiovascular events in high risk patients. *N Engl J Med*, 2000, 342, s. 145–153.
- The EUROpean trial On reduction of cardiac events with Perindopril in stable coronary Artery disease Investigators. On reduction of cardiac events with Perindopril in stable coronary Artery disease Investigators. Efficacy of perindopril in reduction of cardiovascular events among patients with stable coronary artery disease: randomised, double-blind, placebo-controlled, multicentre trial (the EUROPA study). *Lancet*, 2003, 362, s. 782–788.
- Bertrand, M. E.; on behalf of the EUROPA Executive Committee: Synergistic effect of perindopril and calcium channel blockers in prevention of cardiac events and death in coronary artery disease patients – analysis from the EUROPA study. Abstrakt / přednáška, Evropský kardiologický kongres, Mnichov, 2008.
- Poulter, N. R.; for the ASCOT investigators: Role of blood pressure and other variables in the differential cardiovascular event rate noted in the Anglo-Scandinavian Cardiac Outcomes Trial-Blood Pressure Lowering Arm (ASCOT-BPLA). *Lancet*, 2005, 366, s. 907–913.
- The CAFE Investigators, for the Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT) Investigators: Differential impact of blood pressure – lowering drugs on central aortic pressure and clinical outcomes. *Circulation*, 2006, 113, s. 1213–1225.
- Simons, L. A. – Chung, E. – Ortiz, M.: Long term persistence with single-pill, fixed-dosed combination therapy versus two pills of amlodipine and perindopril for hypertension: Australian experience. *Curr Med Res Opin*, 2017, 33, s. 1783–1787.
- Wald, D. S. – Law, M. – Morris, J. K., et al.: Combination therapy versus monotherapy in reducing blood pressure: meta-analysis on 11 000 participants from 42 trials. *Am J Med*, 2009, 122, s. 290–300.
- Bahl, V. K. – Jadhav, U. M. – Thacker, H. P.: Management of hypertension with the fixed combination of perindopril and amlodipine in daily clinical practise. Results from the STRONG Prospective, Observational, Multicenter study. *Am J Cardiovasc Drugs*, 2009, 9, s. 135–142.
- Ferrari, R.: Optimizing the treatment of hypertension and stable coronary artery disease: clinical evidence for fixed-combination perindopril/amlodipine. *Curr Med Res Opin*, 2008, 24, s. 3543–3557.
- Jamerson, K. – Weber, M. A. – Bakris, G. L., et al.: ACCOMPLISH Trial Investigators: Benazepril plus amlodipine or hydrochlorothiazide for hypertension in high risk patients. *N Engl J Med*, 2008, 359, s. 2417–2428.
- Fox, K., ústní prezentace, Evropský kardiologický kongres, Mnichov 2008.

## Ezetimib a jeho postavení v léčbě hyperlipoproteinemie

doc. MUDr. Tomáš Kovárník, Ph.D. II. interní klinika kardiologie a angiologie VFN v Praze a 1. LF UK, Praha

MUDr. Michaela Šnejdrová, Ph.D. III. interní klinika endokrinologie a metabolismu VFN v Praze a 1. LF UK, Praha

MUDr. Karel Kopřiva Kardiologické oddělení Nemocnice Na Homolce, Praha

- van Heek, M. – Davis, H.: Pharmacology of ezetimibe. *Eur Heart J Suppl*, 2002, 4, suppl. J, s. J5–J8.
- Catapano, A. L. – Graham, I. – De Backer, G.: 2016 ESC/EAS Guidelines for the management of dyslipidaemias. *Eur Heart J*, 2016, 37, s. 2999–3058.
- Ferreira, A. M. – da Silva, P. M.: Defining the place of ezetimibe / atorvastatin in the management of hyperlipidemia. *Am J Cardiovasc Drugs*, Springer International Publishing Switzerland 2016.
- Davis, H. R. Jr. – Compton, D. S. – Hoos, L., et al.: Ezetimibe, a potent cholesterol absorption inhibitor, inhibits the development of atherosclerosis in apoE knockout mice. *Arterioscler Thromb Vasc Biol*, 2001, 21, s. 2032–2033.
- Kovarnik, T. – Mintz, G. S. – Skalicka, H., et al.: Virtual histology evaluation of atherosclerosis regression during atorvastatin and ezetimibe administration. *Circ J*, 2012, 7, s. 176–183.
- Tsujita, K. – Sugiyama, S. – Sumida, H., et al.: Impact of dual lipid-lowering strategy with ezetimibe and atorvastatin on coronary plaque regression in patients with percutaneous coronary intervention. The Multicenter Randomized Controlled PRECISE-IVUS Trial. *JACC*, 2015, 66, s. 495–507.
- Ueda, Y. – Hiro, T. – Hirayama, A., et al.: Effect of ezetimibe on stabilization and regression of intracoronary plaque – The ZIPANGU Study. *Circ J*, 2017, 81, s. 161–169.
- Hougaard, M. – Hansen, H. – Thyssen, P., et al.: Influence of ezetimibe in addition to high-dose atorvastatin therapy on plaque composition in patients with ST-segment elevation myocardial infarction assessed by serial Intravascular ultrasound with iMap: the OCTIVUS trial. *Cardiovasc Revasc Med*, 2017, 18, s. 110–117.
- Hibi, K. – Sonoda, S. – Kawasaki, M., et al.: Effects of ezetimibe-statin combination therapy on coronary atherosclerosis in acute coronary syndrome. *Circ J*, 2017, doi: 10.1253/circj.CJ-17-0598, Epub před tiskem.
- Cannon, Ch. – Blazing, M. A. – Giugliano, R. P., et al.: Ezetimibe added to statin therapy after acute coronary syndromes. *NEJM*, 2015, 372, s. 2378–2397.
- Nicholls, S. – Hsu, A. – Wolski, K., et al.: Intravascular ultrasound-derived measures of coronary atherosclerotic plaque burden and clinical outcome. *J Am Coll Cardiol*, 2010, 55, s. 2399–2407.
- Rossebo, A. B. – Pedersen, T. R. – Boman, K., et al.: Intensive lipid lowering with simvastatin and ezetimibe in aortic stenosis. *N Engl J Med*, 2008, 359, s. 1343–1356.
- Sharp Collaborative Group: Study of Heart and Renal Protection (SHARP): randomized trial to assess the effects of lowering low-density lipoprotein cholesterol among 9,438 patients with chronic kidney disease. *Am Heart J*, 2010, 160, s. 785–794, s. 10.
- Baigent, C. – Landray, M. J. – Emberson, J., et al.: The effects of lowering lipid LDL cholesterol with simvastatin plus ezetimibe in patients with chronic kidney disease (Study of Heart and renal Protection): a randomized placebo-controlled trial. *Lancet*, 2011, 377, s. 2181–2192.
- Murphy, S. – Cannon, Ch. – Blazing, M., et al.: Reduction in total cardiovascular events with ezetimibe/simvastatin post-acute coronary syndrome. *J Am Coll Cardiol*, 2016, 67, s. 353–361.
- Hoe, E. – Hegele, R.: Lipid management in diabetes with a focus on emerging therapies. *Canad Journal Diabet*, 2015, 39, s. 2183–2190.
- Soška, V.: Vliv kombinace simvastatinu s ezetimibem na krevní lipidy a na kardiovaskulární příhody u diabetiků (komentář k výsledkům subanalýzy studie IMPROVE-IT). *Vnitř Lék*, 2015, 61, s. 965–969.
- Leiter, L. A. – Lundman, P. – da Silva, P. M., et al.: Persistent lipid abnormalities in statin-treated patients with diabetes mellitus in Europe and Canada: results of the Dyslipidemia International Study. *Diabet Med*, 2011, 28, s. 1343–1351.
- Gylling, H. – Miettinen, T. A.: Cholesterol absorption and lipoprotein metabolism in type II diabetes mellitus with and without coronary artery disease. *Atherosclerosis*, 1996, 126, s. 325–332.
- Park, S. W.: Intestinal and hepatic Niemann-Pick C1-like 1. *Diabetes Metab J*, 2013, 37, s. 240–248.
- Federici, M.: Effect of ezetimibe on cholesterol absorption and lipoprotein composition in diabetes and metabolic syndrome. *Atherosclerosis*, 2015, 17, s. 17–22.
- Riuggenenti, P. – Cattaneo, D. – Rosa, S., et al.: Effects of combined ezetimibe and simvastatin therapy as compared with simvastatin alone in patients with type 2 diabetes: a prospective randomized double-blind clinical trial. *Diabetes Care*, 2010, 33, s. 1954–1956.

## Fabryho choroba – myslíme na ni ve své praxi?

doc. MUDr. David Zemánek, Ph.D. II. interní klinika kardiologie a angiologie VFN a 1. LF UK, Praha

- Garman, S. C. – Garboczi, D. N.: The molecular defect leading to Fabry disease: structure of human alpha-galactosidase. *J Mol Biol*, 2004, 337, s. 319.
- Ortiz, A. – Germain, D. P. – Desnick, R. J., et al.: Fabry disease revisited: Management and treatment recommendations for adult patients. *Mol Genet Metab*, 2018, Epub před tiskem.
- Sheppard, M. N.: The heart in Fabry's disease. *Cardiovasc Pathol*, 2011, 20, s. 8–14.
- Moon, J. C. – Sachdev, B. – Elkington, A. G., et al.: Gadolinium enhanced cardiovascular magnetic resonance in Anderson-Fabry disease. Evidence for a disease specific abnormality of themyocardial interstitium. *Eur Heart J*, 2003, 24, s. 2151.
- Krämer, J. – Weidemann, F.: Biomarkers for diagnosing and staging of Fabry disease. *Curr Med Chem*, 2017, Epub před tiskem.
- Schiffmann, R. – Kopp, J. B. – Austin, H. A., et al.: Enzyme replacement therapy in Fabry disease: a randomised controlled trial. *JAMA*, 2001, 285, s. 2743–2749.
- Hughes, D. A. – Elliott, P. M. – Shah, J., et al.: Effects of enzyme replacement therapy on the cardiomyopathy of Anderson-Fabry disease: a randomised, double-blind, placebo-controlled clinical trial of agalsidase alfa. *Heart*, 2008, 94, s. 153–158.
- Germain, D. P. – Hughes, D. A. – Nicholls, K., et al.: Treatment of Fabry's disease with the pharmacologic chaperone migalastat. *N Engl J Med*, 2016, 375, s. 545–555.
- Hughes, D. A. – Nicholls, K. – Shankar, S. P., et al.: Oral pharmacological chaperone migalastat compared with enzyme replacement therapy in Fabry disease: 18-month results from the randomised phase III ATTRACT study. *J Med Genet*, 2017, 54, s. 288–296.

# Využití sartanů k ovlivnění poškození cílových orgánů a snížení KV rizika. Účinek antihypertenziv nekončí kontrolou krevního tlaku

doc. MUDr. Jan Václavík, Ph.D. Centrum pro hypertenzi, I. interní klinika – kardiologická, FN Olomouc a LF UP, Olomouc

- Schmieder, R. E.: End organ damage in hypertension. *Dtsch Arztebl Int*, 2010, 107, s. 866–873.
- Mancia, G. – Fagard, R. – Narkiewicz, K., et al.: Task Force Members: 2013 ESH/ESC Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J Hypertens*, 2013, 31, s. 1281–1357.
- Franco, O. H. – Peeters, A. – Bonneux, L., et al.: Blood pressure in adulthood and life expectancy with cardiovascular disease in men and women: life course analysis. *Hypertension*, 2005, 46, s. 280–286.
- Dzau, V. J.: Tissue renin-angiotensin system in myocardial hypertrophy and failure. *Arch Intern Med*, 1993, 153, s. 937–942.
- Alfakih, K. – Maqbool, A. – Sivananthan, M., et al.: Left ventricle mass index and the common, functional, X-linked angiotensin II type-2 receptor gene polymorphism (-1332 G/A) in patients with systemic hypertension. *Hypertension*, 2004, 43, s. 1189–1194.
- Alfakih, K. – Walters, K. – Jones, T., et al.: New gender-specific partition values for ECG criteria of left ventricular hypertrophy: recalibration against cardiac MRI. *Hypertension*, 2004, 44, s. 175–179.
- Verdecchia, P. – Carini, G. – Circo, A., et al.: MAVI (MASSA Ventricolare sinistra nell'ipertensione) Study Group: Left ventricular mass and cardiovascular morbidity in essential hypertension: the MAVI study. *J Am Coll Cardiol*, 2001, 38, s. 1829–1835.
- Klingbeil, A. U. – Schneider, M. – Martus, P., et al.: A meta-analysis of the effects of treatment on left ventricular mass in essential hypertension. *Am J Med*, 2003, 115, s. 41–46.
- Verdecchia, P. – Sleight, P. – Mancia, G., et al.: Effects of telmisartan, ramipril, and their combination on left ventricular hypertrophy in individuals at high vascular risk in the Ongoing Telmisartan Alone and in Combination With Ramipril Global End Point Trial and the Telmisartan Randomized Assessment Study in ACE Intolerant Subjects With Cardiovascular Disease. *Circulation*, 2009, 120, s. 1380–1389.
- Chambless, L. E. – Folsom, A. R. – Clegg, L. X., et al.: Carotid wall thickness is predictive of incident clinical stroke: the Atherosclerosis Risk in Communities (ARIC) study. *Am J Epidemiol*, 2000, 151, s. 478–487.
- Touboul, P. J. – Hennerici, M. G. – Meairs, S., et al.: Mannheim carotid intima-media thickness and plaque consensus (2004–2006–2011). An update on behalf of the advisory board of the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> watching the risk symposia, at the 13<sup>th</sup>, 15<sup>th</sup> and 20<sup>th</sup> European Stroke Conferences, Mannheim, Germany, 2004, Brussels, Belgium, 2006, and Hamburg, Germany, 2011. *Cerebrovasc Dis*, 2012, 34, s. 290–296.
- European Stroke Organisation, Tenders, M. – Aboyans, V. – Bartelink, M. L., et al.: ESC Committee for Practice Guidelines: ESC Guidelines on the diagnosis and treatment of peripheral artery diseases: Document covering atherosclerotic disease of extracranial carotid and vertebral, mesenteric, renal, upper and lower extremity arteries: the Task Force on the Diagnosis and Treatment of Peripheral Artery Diseases of the European Society of Cardiology (ESC). *Eur Heart J*, 2011, 32, s. 2851–2906.
- Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group: KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Int*, 2013, suppl., 3, s. 1–150.
- Levey, A. S. – Stevens, L. A. – Schmid, C. H., et al.: A new equation to estimate glomerular filtration rate. *Ann Intern Med*, 2009, 150, s. 604–612.
- Mann, J. F. E. – Schmieder, R. E. – McQueen, M., et al.: Renal outcomes with telmisartan, ramipril, or both, in people at high vascular risk (the ONTARGET study): a multicentre, randomised, double-blind, controlled trial. *Lancet*, 2008, 372, s. 547–553.
- Elliott, W. J. – Meyer, P. M.: Incident diabetes in clinical trials of antihypertensive drugs: a network meta-analysis. *Lancet*, 2007, 369, s. 201–207.
- ONTARGET Investigators; Yusuf, S. – Teo, K. K., et al.: Telmisartan, ramipril, or both in patients at high risk for vascular events. *N Engl J Med*, 2008, 358, s. 1547–1559.
- van Vark, L. C. – Bertrand, M. – Akkerhuis, K. M., et al.: Angiotensin-converting enzyme inhibitors reduce mortality in hypertension: a meta-analysis of randomized clinical trials of renin-angiotensin-aldosterone system inhibitors involving 158,998 patients. *Eur Heart J*, 2012, 33, s. 2088–2097.
- Lewington, S. – Clarke, R. – Qizilbash, N., et al.: Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. *Lancet*, 2002, 360, s. 1903–1913.
- Savarese, G. – Costanzo, P. – Cleland, J. G., et al.: A meta-analysis reporting effects of angiotensin-converting enzyme inhibitors and angiotensin receptor blockers in patients without heart failure. *J Am Coll Cardiol*, 2013, 61, s. 131–142.

## Pacient s fibrilací síní podstupuje koronární intervenci: antitrombotická léčba ve světle nových studií

MUDr. Petr Janský Klinika kardiovaskulární chirurgie 2. LF UK a FN v Motole, Praha

- Dewilde, W. J. – Oirbans, T. – Verheugt, F. W., et al.: WOEST study investigators: Use of clopidogrel with or without aspirin in patients taking oral anticoagulant therapy and undergoing percutaneous coronary intervention: an open-label, randomised, controlled trial. *Lancet*, 2013, 381, s. 1107–1115.
- Gibson, C. M. – Mehran, R. – Bode, C., et al.: Prevention of bleeding in patients with atrial fibrillation undergoing PCI. *New Engl J Med*, 2016, 375, s. 2423–2434.
- Cannon, C. P. – Bhatt, D. L. – Oldgren, J., et al.: Dual anti-thrombotic therapy with dabigatran after PCI in atrial fibrillation. *New Engl J Med*, 2017, 377, s. 1513–1524.

## Antitrombotická léčba po akutním koronárním syndromu – update 2017. Jaká, komu a jak dlouho?

MUDr. Roman Miklík, Ph.D. | MUDr. Marie Pavlušová Interní kardiologická klinika, FN a LF MU, Brno

- Valgimigli, M. – Bueno, H. – Byrne, R. A., et al.: 2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS The Task Force for dual antiplatelet therapy in coronary artery disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*, 2017, s. 1–48, doi:10.1093/eurheartj/ehx419.
- Ibanez, B. – James, S. – Agewall, S., et al.: 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. *Eur Heart J*, 2018, s. 119–177, doi:10.1093/eurheartj/ehx393.
- Stone, G. W. – Brodie, B. R. – Griffin, J. J., et al.: Role of cardiac surgery in the hospital phase management of patients treated with primary angioplasty for acute myocardial infarction. *Am J Cardiol*, 2000, 85, s. 1292–1296.
- Montalescot, G. – Bolognese, L. – Dudek, D., et al.: Pretreatment with prasugrel in non-ST-segment elevation acute coronary syndromes. *N Engl J Med*, 2013, 369, s. 999–1010, doi:10.1056/NEJMoa1308075.
- Toušek, P. – Horák, D. – Toušek, F., et al.: Trends in epidemiology and the treatment of acute coronary syndromes in the Czech Republic: Comparison of the CZECH-1 and CZECH-2 registries. *Cor Vasa*, 2014, 56, s. e285–e290, doi:10.1016/j.corvasa.2014.06.006.
- Roffi, M. – Patrono, C. – Collet, J.-P., et al.: 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. *Eur Heart J*, 2016, 37, s. 267–315, doi:10.1093/eurheartj/ehv320.
- Widimský, P. – Rokyta, R. – Štásek, J. – Bělohávek, J., et al.: Acute coronary syndromes with ongoing myocardial ischemia (ACS with OMI) versus acute coronary syndromes without ongoing ischemia (ACS without OMI): The new classification of acute coronary syndromes should replace old classification based on ST segment elevation presence or absence – Expert consensus statement of the Czech Society of Cardiology. *Cor Vasa*, 2013, 55, s. e225–e227, doi:10.1016/j.corvasa.2013.04.008.
- Wiviott, S. D. – Braunwald, E. – McCabe, C. H., et al.: Prasugrel versus clopidogrel in patients with acute coronary syndromes. *N Engl J Med*, 2007, 357, s. 2001–2015, doi:10.1056/NEJMoa0706482.
- Wallentin, L. – Becker, R. C. – Budaj, A., et al.: Ticagrelor versus clopidogrel in patients with acute coronary syndromes. *N Engl J Med*, 2009, 361, s. 1045–1057, doi:10.1056/NEJMoa0904327.
- Miklík, R. – Pavlušová, M.: Která kombinace duální antiagregace bude u mého pacienta v souvislosti s akutním koronárním syndromem nejlepší? *Interní Med*, 2016, 18, s. 184–190.
- Motovska, Z. – Hlinomaz, O. – Miklík, R., et al.: Prasugrel versus ticagrelor in patients with acute myocardial infarction treated with primary percutaneous coronary intervention: multicenter randomized PRAGUE-18 study. *Circulation*, 2016, 134, s. 1603–1612, doi:10.1161/CIRCULATIONAHA.116.024823.
- Motovska, Z. – Hlinomaz, O. – Kala, P., et al.: One-year outcomes of prasugrel versus ticagrelor in acute myocardial infarction treated with primary angioplasty: the PRAGUE-18 study. *J Am Coll Cardiol*, 2017, online před tiskem, doi:10.1016/j.jacc.2017.11.008.
- Bonaca, M. P. – Bhatt, D. L. – Cohen, M., et al.: Long-term use of ticagrelor in patients with prior myocardial infarction. *N Engl J Med*, 2015, 372, s. 1791–1800, doi:10.1056/NEJMoa1500857.
- Costa, F. – van Klaveren, D. – James, S., et al.: Derivation and validation of the predicting bleeding complications in patients undergoing stent implantation and subsequent dual antiplatelet therapy (PRECISE-DAPT) score: a pooled analysis of individual-patient datasets from clinical trials. *Lancet Lond Engl*, 2017, 389, s. 1025–1034, doi:10.1016/S0140-6736(17)30397-5.
- Kereiakes, D. J. – Yeh, R. W. – Massaro, J. M., et al.: DAPT score utility for risk prediction in patients with or without previous myocardial infarction. *J Am Coll Cardiol*, 2016, 67, s. 2492–2502, doi:10.1016/j.jacc.2016.03.485.
- Cuisset, T. – Deharo, P. – Quilici, J., et al.: Benefit of switching dual antiplatelet therapy after acute coronary syndrome: the TOPIC (timing of platelet inhibition after acute coronary syndrome) randomized study. *Eur Heart J*, 2017, 38, s. 3070–3078, doi:10.1093/eurheartj/ehx175.
- Sibbing, D. – Aradi, D. – Jacobshagen, C., et al.: Guided de-escalation of antiplatelet treatment in patients with acute coronary syndrome undergoing percutaneous coronary intervention (TROPICAL-ACS): a randomised, open-label, multicentre trial. *Lancet Lond Engl*, 2017, 390, s. 1747–1757, doi:10.1016/S0140-6736(17)32155-4.
- Gibson, C. M. – Mehran, R. – Bode, C., et al.: Prevention of bleeding in patients with atrial fibrillation undergoing PCI. *N Engl J Med*, 2016, 375, s. 2423–2434, doi:10.1056/NEJMoa1611594.
- Cannon, C. P. – Bhatt, D. L. – Oldgren, J., et al.: Dual antithrombotic therapy with dabigatran after PCI in atrial fibrillation. *N Engl J Med*, 2017, 377, s. 1513–1524, doi:10.1056/NEJMoa1708454.

# Veno-venózní ECMO a včasná identifikace rizika a management spontánního intrakraniálního krváčení

MUDr. Jiří Slíva, MD., Ph.D. Ústav farmakologie 3. LF UK, Praha

- Gattinoni, L. – Carlesso, E. – Langer, T.: Clinical review: Extracorporeal membrane oxygenation. *Crit Care*, 2011, 15, s. 243.
- Combes, A. – Bacchetta, M. – Brodie, D., et al.: Extracorporeal membrane oxygenation for respiratory failure in adults. *Curr Opin Crit Care*, 2012, 18, s. 99–104.
- Zangrillo, A. – Landoni, G. – Biondi-Zoccai, G., et al.: A meta-analysis of complications and mortality of extracorporeal membrane oxygenation. *Critical care and resuscitation: Journal of the Australasian Academy of Critical Care Medicine*, 2013, 15, s. 172–178.
- Paden, M. L. – Conrad, S. A. – Rycus, P. T., et al.: Registry E. Extracorporeal Life Support Organization Registry Report 2012. *ASAIO*, 2013, 59, s. 202–210.
- Kalbhenn, J. – Schmidt, R. – Nakamura, L., et al.: Early diagnosis of acquired von Willebrand Syndrome (AVWS) is elementary for clinical practice in patients treated with ECMO therapy. *J Atheroscler Thromb*, 2015, 22, s. 265–271.
- Esper, S. A. – Levy, J. H. – Waters, J. H., et al.: Extracorporeal membrane oxygenation in the adult: a review of anticoagulation monitoring and transfusion. *Anesth Analg*, 2014, 118, s. 731–743.
- Ang, A. L. – Teo, D. – Lim, C. H., et al.: Blood transfusion requirements and independent predictors of increased transfusion requirements among adult patients on extracorporeal membrane oxygenation – a single centre experience. *Vox Sang*, 2009, 96, s. 34–43.
- Kalbhenn, J. – Wittau, N. – Schmutz, A., et al.: Identification of acquired coagulation disorders and effects of target-controlled coagulation factor substitution on the incidence and severity of spontaneous intracranial bleeding during veno-venous ECMO therapy. *Perfusion*, 2015, s. 1–8.

## Proč mají kardiologové diagnostikovat u pacientů spánkovou apnoe

MUDr. Jiří Veselý Kardiologická ambulance EDUMED Broumov

- American Academy of Sleep Medicine Task Force. Sleep-related breathing disorders in adult: Recommendation for syndrome definition and measurement techniques in clinical research. The Report of an American Academy of Sleep Medicine Task Force. *Sleep*, 1999, 22, s. 667–689.
- Gonzaga, C. – Bertolami, A. – Bertolami, M., et al.: Obstructive sleep apnea, hypertension and cardiovascular diseases. *J Hum Hypertens*, 2015, 29, s. 705–712.
- Young, T. – Evans, L. – Finn, L., et al.: Estimation of the clinically diagnosed proportion of sleep apnea syndrome in middle-aged men and women. *Sleep*, 1997, 20, s. 705–706.
- Somers, V. K. – White, D. P. – Amin, R., et al.: Sleep apnea and cardiovascular disease: an American Heart Association/American College of Cardiology Foundation Scientific Statement from the American Heart Association Council for High Blood Pressure Research Professional Education Committee, Council on Clinical Cardiology, Stroke Council, and Council on Cardiovascular Nursing. *J Am Coll Cardiol*, 2008, 52, s. 686–717.
- Logan, A. G. – Perlikowski, S. M. – Mente, A., et al.: High prevalence of unrecognized sleep apnoea in drug-resistant hypertension. *J Hypertens*, 2001, 19, s. 2271–2277.
- Stevenson, I. H. – Teichtahl, H. – Cunningham, D., et al.: Prevalence of sleep disordered breathing in paroxysmal and persistent atrial fibrillation patients with normal left ventricular function. *Eur Heart J*, 2008, 29, s. 1662–1669.
- Oldenburg, O. – Lamp, B. – Faber, L., et al.: Sleep-disordered breathing in patients with symptomatic heart failure: a contemporary study of prevalence in and characteristics of 700 patients. *Eur J Heart Fail*, 2007, 9, s. 251–257.
- Johnson, K. G. – Johnson, D. C.: Frequency of sleep apnea in stroke and TIA patients: a meta-analysis. *J Clin Sleep Med*, 2010, 6, s. 131–137.
- Sjöström, C. – Lindberg, E. – Elmasry, A., et al.: Prevalence of sleep apnoea and snoring in hypertensive men: a population based study. *Thorax*, 2002, 57, s. 602–607.
- Pecker, Y. – Kraicz, H. – Hedner, J., et al.: An independent association between obstructive sleep apnea and coronary artery disease. *Eur Respir J*, 1999, 13, s. 179–184.
- Piepoli, M. F. – Hoes, A. W. – Agewall, S., et al.: 2016 European Guidelines on cardiovascular disease prevention in clinical practice: The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts) Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR). *European Heart J*, 2016, 37, s. 2315–2381.
- Netzer, N. C. – Shoohs, R. A. – Netzer, C. M., et al.: Using Berlin questionnaire to identify patients at risk for the sleep apnea syndrome. *Ann Intern Med*, 1999, 131, s. 485–491.
- Johns, M. W.: A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep*, 1991, 14, s. 540–545.
- Bělehrad, M. – Kára, T. – Matuška, P., et al.: Vyšetření poruch dýchání ve spánku od A do Z. *Kardiolog Rev Int Med*, 2013, 15, s. 79–86.
- Lavie, P. – Herer, P. – Hoffstein, V.: Obstructive sleep apnoea syndrome as a risk factor for hypertension: population study. *BMJ*, 2000, 320, s. 479–482.
- Peppard, P. E. – Young, T. – Palta, M., et al.: Prospective study of the association between sleep-disordered breathing and hypertension. *N Engl J Med*, 2000, 342, s. 1378–1384.
- Mancia, G. – Fagard, R. – Narkiewicz, K., et al.: 2013 ESH/ESC Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J Hypertens*, 2013, 31, s. 1281–1357.
- Montesi, S. B. – Edwards, B. A. – Malhotra, A., et al.: The effect of continuous positive airway pressure treatment on blood pressure: a systematic review and meta-analysis of randomized controlled trials. *J Clin Sleep Med*, 2012, 8, s. 587–596.
- Bazzano, L. A. – Khan, Z. – Reynolds, K., et al.: Effect of nocturnal nasal continuous positive airway pressure on blood pressure in obstructive sleep apnea. *Hypertension*, 2007, 50, s. 417–423.
- Alajmi, M. – Mulgrew, A. T. – Fox, J., et al.: Impact of continuous positive airway pressure therapy on blood pressure in patients with obstructive sleep apnea hypopnea: a meta-analysis of randomized controlled trials. *Lung*, 2007, 185, s. 67–72.
- Mo, L. – He, Q. Y.: Effect of long-term continuous positive airway pressure ventilation on blood pressure in patients with obstructive sleep apnea hypopnea syndrome: a meta-analysis of clinical trials. *Zhonghua yi xue za zhi*, 2007, 87, s. 1177–1180.
- Haentjens, P. – Van Meerhaeghe, A. – Moscariello, A., et al.: The impact of continuous positive airway pressure on blood pressure in patients with obstructive sleep apnea syndrome: evidence from a meta-analysis of placebo-controlled randomized trials. *Arch Intern Med*, 2007, 167, s. 757–764.
- Harsch, I. A. – Schahin, S. P. – Radespiel-Tröger, M., et al.: Continuous positive airway pressure treatment rapidly improves insulin sensitivity in patients with obstructive sleep apnea syndrome. *Am J Respir Crit Care Med*, 2004, 169, s. 156–162.
- Schahin, S. P. – Nechanitzky, T. – Dittel, C., et al.: Long-term improvement of insulin sensitivity during CPAP therapy in the Obstructive Sleep Apnoea Syndrome. *Med Sci Monit*, 2008, 14, s. 117–121.
- Antonopoulos, C. N. – Sergentanis, T. N. – Daskalopoulou, S. S., et al.: Nasal continuous positive airway pressure (nCPAP) treatment for obstructive sleep apnea, road traffic accidents and driving simulator performance: A meta-analysis. *Sleep Med Rev*, 2011, 15, s. 301–310.
- Whelton, P. K. – Carey, R. M. – Aronow, W. S., et al.: ACC/AHA/AAPA/ABC/ACPM/AGS/APHA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol*, 13, 11. 2017, Epub před tiskem.
- Vizzardi, E. – Sciatti, E. – Bonadei, I., et al.: Obstructive sleep apnoea-hypopnoea and arrhythmias: new updates. *J Cardiovasc Med* (Hagerstown), 2014, doi: 10.2459/JCM.0000000000000043.
- Digby, G. C. – Baranchuk, A.: Sleep apnea and atrial fibrillation; 2012 update. *Curr Cardiol Rev*, 2012, 8, s. 265–272.
- Patel, D. – Mohanty, P. – Di Biase, L., et al.: Safety and efficacy of pulmonary vein antral isolation in patients with obstructive sleep apnea: the impact of continuous positive airway pressure. *Circ Arrhythm Electrophysiol*, 2010, 3, s. 445–451.
- Fein, A. S. – Shvilkin, A. – Shah, D., et al.: Treatment of obstructive sleep apnea reduces the risk of atrial fibrillation recurrence after catheter ablation. *J Am Coll Cardiol*, 2013, 62, s. 300–305.
- Naruse, Y. – Tada, H. – Satoh, M., et al.: Concomitant obstructive sleep apnea increases the recurrence of atrial fibrillation following radiofrequency catheter ablation of atrial fibrillation: clinical impact of continuous positive airway pressure therapy. *Heart Rhythm*, 2013, 10, s. 331–337.
- Neilan, T. G. – Farhad, H. – Dodson, J. A., et al.: Effect of sleep apnea and continuous positive airway pressure on cardiac structure and recurrence of atrial fibrillation. *J Am Heart Assoc*, 2013, 2, e000421.
- Li, L. – Wang, Z. W. – Li, J., et al.: Efficacy of catheter ablation of atrial fibrillation in patients with obstructive sleep apnoea with and without continuous positive airway pressure treatment: a meta-analysis of observational studies. *Europace*, 2014, 16, s. 1309–1314.
- Kirchhof, P. – Benussi, S. – Kotecha, D., et al.: 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. *European Heart J*, 2016, 37, s. 2893–2962, doi: 10.1093/eurheartj/ehw210.
- Gottlieb, D. J. – Yenokyan, G. – Newman, A. B., et al.: Prospective study of obstructive sleep apnea and incident coronary heart disease and heart failure: the Sleep Heart Health Study. *Circulation*, 2010, 122, s. 352–360.
- Oldenburg, O.: Cheyne-Stokes respiration in chronic heart failure-treatment with adaptive servoventilation therapy. *Circ J*, 2012, 76, s. 2305–2317.
- Khayat, R. – Jarjoura, D. – Porter, K., et al.: Sleep disordered breathing and post-discharge mortality in patients with acute heart failure. *Eur Heart J*, 2015, 36, s. 1463–1469.
- Nakamura, S. – Asai, K. – Kubota, Y., et al.: Impact of sleep-disordered breathing and efficacy of positive airway pressure on mortality in patients with chronic heart failure and sleep-disordered breathing: a meta-analysis. *Clin Res Cardiol*, 2015, 104, s. 208–216.
- Bradley, T. D. – Logan, A. G. – Kimoff, R. J., et al.: Continuous positive airway pressure for central sleep apnea and heart failure. *N Engl J Med*, 2005, 353, s. 2025–2033.
- Angermann, C. – Pia, M. – Erdmann, E., et al.: Adaptive servo-ventilation for central sleep apnea in systolic heart failure. *N Engl J Med*, 2015, 373, s. 1095–1105.
- Ponikowski, P. – Voors, A. A. – Anker, S. D., et al.: 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). *European Heart Journal*, 2016, 37, s. 2129 – 2200.