

volby k metforminu u diabetiků 2. typu s přítomností kardiovaskulárních komplikací (stav po infarktu myokardu, cévní mozkové příhodě atd.) i u nemocných s vysokým kardiovaskulárním rizikem, kde jsou díky studii REWIND důkazy o snížení kardiovaskulárních komplikací při podávání dulaglutidu i u nemocných v primární prevenci.

V případě liraglutidu i semaglutidu měla většina pacientů při zařazení do studie již anamnézu kardiovaskulární příhody, a výsledky lze tedy aplikovat především na pacienty v sekundární prevenci. Naopak v případě dulaglutidu byla většina populace ještě bez anamnézy kardiovaskulární příhody a pacienti tak odpovídali spíše populaci v primární prevenci. Lze předpokládat, že by působení všech tří GLP-1 agonistů mohlo být u obou populací (v primární i v sekundární prevenci) podobné, avšak jasná data z klinických studií pro tyto závěry zatím nemáme.

LITERATURA

- O'Rahilly S. Science, medicine, and the future. Non-insulin dependent diabetes mellitus: the gathering storm. *Bmj*. 1997; 314(7085): 955–959.
- Bluher M. Adipose tissue dysfunction contributes to obesity related metabolic diseases. *Best Pract Res Clin Endocrinol Metab*. 2013; 27(2): 163–177.
- Reaven G, Abbasi F, McLaughlin T. Obesity, insulin resistance, and cardiovascular disease. *Recent Prog Horm Res*. 2004; 59: 207–223.
- Haffner SM, Lehto S, Ronnemaa T, Pyorala K, Laakso M. 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(4): 229–234.
- Chatterjee S, Khunti K, Davies MJ. Type 2 diabetes. *Lancet*. 2017.
- Johnston SS, Conner C, Aagren M, Smith DM, Bouchard J, Brett J. Evidence linking hypoglycemic events to an increased risk of acute cardiovascular events in patients with type 2 diabetes. *Diabetes Care*. 2011; 34(5): 1164–1170.
- Nauck MA. Glucagon-like peptide 1 (GLP-1) in the treatment of diabetes. *Horm Metab Res*. 2004; 36(11–12): 852–858.
- Davies MJ, D'Alessio DA, Fradkin J, et al. Management of Hyperglycemia in Type 2 Diabetes, 2018. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care*. 2018; 41(12): 2669–2701.
- Holman RR, Paul SK, Bethel MA, Matthews DR, Neil HA. 10-year follow-up of intensive glucose control in type 2 diabetes. *N Engl J Med*. 2008; 359(15): 1577–1589.
- Duckworth W, Abraira C, Moritz T, et al. Glucose control and vascular complications in veterans with type 2 diabetes. *N Engl J Med*. 2009; 360(2): 129–139.
- Skyler JS, Bergenstal R, Bonow RO, et al. Intensive glycemic control and the prevention of cardiovascular events: implications of the ACCORD, ADVANCE, and VA Diabetes Trials: a position statement of the American Diabetes Association and a Scientific Statement of the American College of Cardiology Foundation and the American Heart Association. *J Am Coll Cardiol*. 2009; 53(3): 298–304.
- Patel A, MacMahon S, Chalmers J, et al. Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. *N Engl J Med*. 2008; 358(24): 2560–2572.
- Gerstein HC, Miller ME, Byington RP, et al. Effects of intensive glucose lowering in type 2 diabetes. *N Engl J Med*. 2008; 358(24): 2545–2559.
- Nissen SE, Wolski K. Effect of rosiglitazone on the risk of myocardial infarction and death from cardiovascular causes. *N Engl J Med*. 2007; 356(24): 2457–2471.
- Buse JB, Wexler DJ, Tsapas A, et al. 2019 Update to: Management of Hyperglycemia in Type 2 Diabetes, 2018. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care*. 2020; 43(2): 487–493.
- Holst JJ, Deacon CF, Vilsboll T, Krarup T, Madsbad S. Glucagon-like peptide-1, glucose homeostasis and diabetes. *Trends Mol Med*. 2008; 14(4): 161–168.
- Holst JJ, Gromada J. Role of incretin hormones in the regulation of insulin secretion in diabetic and nondiabetic humans. *Am J Physiol Endocrinol Metab*. 2004; 287(2): E199–206.
- Holst JJ, Deacon CF. Inhibition of the activity of dipeptidyl-peptidase IV as a treatment for type 2 diabetes. *Diabetes*. 1998; 47(11): 1663–1670.
- Scheen AJ. Safety of dipeptidyl peptidase-4 inhibitors for treating type 2 diabetes. *Expert Opin Drug Saf*. 2015; 14(4): 505–524.
- Strain WD, Lukashevich V, Kothny W, Hoellinger MJ, Paldanius PM. Individualised treatment targets for elderly patients with type 2 diabetes using vildagliptin add-on or lone therapy (INTERVAL): a 24 week, randomised, double-blind, placebo-controlled study. *Lancet*. 2013; 382(9890): 409–416.
- Mundra V. Evaluation of vildagliptin and fixed dose combination of vildagliptin and metformin on glycemic control and insulin dose over three months in patients with type 2 diabetes mellitus. *Indian J Endocrinol Metab*. 2012; 16(6): 1048.
- Madsbad S. Exenatide and liraglutide: different approaches to develop GLP-1 receptor agonists (incretin mimetics) – preclinical and clinical results. *Best Pract Res Clin Endocrinol Metab*. 2009; 23(4): 463–477.
- Madsbad S, Kielgast U, Asmar M, Deacon C, Torekov SS, Holst JJ. An overview of once-weekly GLP-1 receptor agonists – available efficacy and safety data and perspectives for the future. *Diabetes Obes Metab*. 2011.
- Kuritzky L, Umpierrez G, Ekoe JM, Mancillas-Adame L, Lando LF. Safety and efficacy of dulaglutide, a once weekly GLP-1 receptor agonist, for the management of type 2 diabetes. *Postgrad Med*. 2014; 126(6): 60–72.
- Montanya E, Sesti G. A review of efficacy and safety data regarding the use of liraglutide, a once-daily human glucagon-like peptide 1 analogue, in the treatment of type 2 diabetes mellitus. *Clin Ther*. 2009; 31(11): 2472–2488.
- Pyke C, Heller RS, Kirk RK, et al. GLP-1 receptor localization in monkey and human tissue: novel distribution revealed with extensively validated monoclonal antibody. *Endocrinology*. 2014; 155(4): 1280–1290.
- Aaboe K, Krarup T, Madsbad S, Holst JJ. GLP-1: physiological effects and potential therapeutic applications. *Diabetes Obes Metab*. 2008; 10(11): 994–1003.
- Arakawa M, Mita T, Azuma K, et al. Inhibition of monocyte adhesion to endothelial cells and attenuation of atherosclerotic lesion by a glucagon-like peptide-1 receptor agonist, exendin-4. *Diabetes*. 2010; 59(4): 1030–1037.
- Scirica BM, Bhatt DL, Braunwald E, et al. Saxagliptin and cardiovascular outcomes in patients with type 2 diabetes mellitus. *N Engl J Med*. 2013; 369(14): 1317–1326.
- Green JB, Bethel MA, Armstrong PW, et al. Effect of Sitagliptin on Cardiovascular Outcomes in Type 2 Diabetes. *N Engl J Med*. 2015; 373(3): 232–242.
- White WB, Cannon CP, Heller SR, et al. Alogliptin after acute coronary syndrome in patients with type 2 diabetes. *N Engl J Med*. 2013; 369(14): 1327–1335.
- Rosenstock J, Perkovic V, Johansen OE, et al. Effect of Linagliptin vs Placebo on Major Cardiovascular Events in Adults With Type 2 Diabetes and High Cardiovascular and Renal Risk: The CARMELINA Randomized Clinical Trial. *JAMA*. 2019; 321(1): 69–79.
- Tella SH, Rendell MS. DPP-4 inhibitors: focus on safety. *Expert Opin Drug Saf*. 2015; 14(1): 127–140.
- Cosentino F, Grant PJ, Aboyans V, et al. 2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD. *Eur Heart J*. 2020; 41(2): 255–323.
- Pfeffer MA, Claggett B, Diaz R, et al. Lixisenatide in Patients with Type 2 Diabetes and Acute Coronary Syndrome. *N Engl J Med*. 2015; 373(23): 2247–2257.
- Marso SP, Daniels GH, Brown-Frandsen K, et al. Liraglutide and Cardiovascular Outcomes in Type 2 Diabetes. *N Engl J Med*. 2016; 375(4): 311–322.
- Holman RR, Bethel MA, Mentz RJ, et al. Effects of Once-Weekly Exenatide on Cardiovascular Outcomes in Type 2 Diabetes. *N Engl J Med*. 2017; 377(13): 1228–1239.
- Marso SP, Bain SC, Consoli A, et al. Semaglutide and Cardiovascular Outcomes in Patients with Type 2 Diabetes. *N Engl J Med*. 2016; 375(19): 1834–1844.
- Gerstein HC, Colhoun HM, Dagenais GR, et al. Dulaglutide and cardiovascular outcomes in type 2 diabetes (REWIND): a double-blind, randomised placebo-controlled trial. *Lancet*. 2019; 394(10193): 121–130.

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