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Psoriasiform lesions as a side effect of SGLT-2 therapy

Jakub Krzysztof Gałązka[1], Łukasz Domagalski[2], Piotr Homa[3], Zofia Hoffman[4]

1 – Students' Scientific Association at the Department and Clinic of Endocrinology, Diabetology and Metabolic Diseases, Medical University of Lublin, Jaczewskiego 8, 20-954 Lublin, Poland; ORCID 0000-0003-3128-773X; e-mail: jakubgalazka2@wp.pl

2 – Students' Scientific Association at Department and Clinic of Neurosurgery and Pediatric Neurosurgery, Medical University of Lublin, Jaczewskiego 8, 20-954 Lublin, Poland; ORCID 0000-0001-6910-4607; e-mail: lukdom4@gmail.com

3 – Students' Scientific Association at the Department of Pediatric Hematology, Oncology and Transplantation, Medical University of Lublin, Gebali 6, 20-093 Lublin, Poland; ORCID 0000-0003-0751-7400; e-mail: p.k.homa@gmail.com

4 - Students' Scientific Association at Chair of Human Anatomy, Medical University of Lublin, Jaczewskiego 4, 20-090 Lublin, Poland, ORCID: 0000-0001-7996-0706, e-mail: zofhof@gmail.com

Abstract

SGLT-2 inhibitors (flozins) are one of the new classes of anti-diabetic drugs, used from 2012. They are highly recommended in case of intolerance or contraindication of metformin, but in Poland they are used usually as third-line drug after metformin and sulfonylurea. They growing popularity is caused by their significance in cardiovascular risk reduction and preventive role in according to diabetes complications like chronic kidney

disease, or diabetes-induced dementia. The aid of this article is to summarize the knowledge on the risk of psoriasis development in diabetic patients cured with flozins.

In according to the newest studies, flozins may be considered as a pro-psoriatic factor, increasing the risk of this skin disease, especially in patients with diabetic kidney disease. But on the other hand, SGLT-2 inhibitors have significantly decreasing effect on cardiovascular risk, which is increased in psoriatic patients.

Keywords: flozins, SGLT-2 inhibitors, psoriasis, diabetes, diabetic kidney disease, diabetology, dermatology

Introduction

SGLT-2 inhibitors (flozins) are one of the new classes of anti-diabetic drugs, used from 2012. They are highly recommended in case of intolerance or contraindication of metformin, but in Poland they are used usually as third-line drug after metformin and sulfonylurea[1]. They growing popularity is caused by their significance in cardiovascular risk reduction[2, 3] and preventive role in according to diabetes complications like chronic kidney disease[4], or diabetes-induced dementia[5].

In the courses of both diabetes and psoriasis, patient's lifestyle have significant impact on[6–8]. Nevertheless, those disorders have significant impact on each other – due to diabetic chances in skin physiology [9–11] . An average prevalence of type 2 diabetes in psoriasis patients is 11.6%[12]. A crucial element of psoriasis etiopathogenesis is consent inflammation, which results up with keratinocytes damage[8], and may be caused by adipose tissue secretion of hormones (adipokines) and proinflammatory cytokines[13, 14].

The aid of this article is to summarize the knowledge on the risk of psoriasis development in diabetic patients cured with flozins.

Methods

To collect necessary articles, the literature review was performed using two databases – PubMed and GoogleScholar. Used keywords included “SGLT2 inhibitors” and “psoriasis”, or synonyms of those two. Articles written in languages other than Polish and English were rejected.

State of the art

At first, the anti-inflammatory properties of SGLT-2 inhibitors were considered to play a key role in the treatment of both diabetes and other pathological conditions with inflammation [15] . Additionally, psoriasis is considered as an independent factor of cardiovascular diseases - and its risk reduction by flozins is evidenced, so the intake of SGLT-2 inhibitors by psoriatic patients may be considered as useful[16, 17].

Flozins may have an anti-inflammatory effect by modulating the NLRP3 inflammasome and IL-17 and IL-23 inflammatory axis, which are involved in the etiopathogenesis of psoriasis[18, 19].

The first study on psoriatic risk in diabetic patients treated with flozins was performed in 2018. On the one hand, the study was performed using central Japanese database of drug adverse events, but on the other hand the skin lesions and disorders were analyzed in general (psoriasis was not analyzed in separation from another). In this study only the ipragliflozin was appointed as a plausible factor for skin disorders occurrence[20].

The newest study about the potential pro-psoriatic effect of SGLT-2 inhibitors is a population-based study conducted in Taiwan. The study results’ indicate that SGLT-2 inhibitors rises 2,7 times the risk of psoriasis in patients with diabetic renal disease[21].

On the other hand, in compare to other anti-diabetic agents, metformin and sulfonylurea drugs are considered to have bigger risk of cutaneous side effects, including psoriasiform[22].

Conclusion

In according to the newest studies, flozins may be considered as a pro-psoriatic factor, increasing the risk of this skin disease, especially in patients with diabetic kidney disease. But on the other hand, SGLT-2 inhibitors have significantly decreasing effect on cardiovascular risk, which is increased in psoriatic patients.

References

1. Wróbel M, Rokicka D, Strojek K. Flozins — in the light of the latest recommendations. Endokrynol Pol. 2021;72:589–91.
2. Younis A, Wazni OM. SGLT2 Inhibition and Atrial Fibrillation: Faint Light at the End of the Tunnel. JACC Clin Electrophysiol. 2022;8:1405–6.
3. Capuano A, Clementi E, Paolisso G. Editorial: Clinical prospective of SGLT2 inhibitors in atherosclerosis. Front Cardiovasc Med. 2022. doi:10.3389/FCVM.2022.1040649.
4. Czarkowski M, Raksa K, Powroźniak E, Spozowski K. Impact of SGLT2 inhibitors treatment on the chronic kidney disease in people with type 2 diabetes. Journal of Education, Health and Sport. 2022;12:319–27.
5. Pawlos A, Broncel M, Woźniak E, Gorzelak-Pabiś P. Neuroprotective Effect of SGLT2 Inhibitors. Molecules. 2021. doi:10.3390/MOLECULES26237213.
6. Spozowski K, Powroźniak E, Raksa K, Czarkowski M, Oleksa P. Influence of physical activity, diet, psychic stress and other diseases on psoriaris. Journal of Education, Health and Sport. 2022;12:361–75.
7. Zucatti KP, Teixeira PP, Wayerbacher LF, Piccoli GF, Correia PE, Fonseca NKO et al. Long-term Effect of Lifestyle Interventions on the Cardiovascular and All-Cause Mortality of Subjects With Prediabetes and Type 2 Diabetes: A Systematic Review and Meta-analysis. Diabetes Care. 2022;45:2787–95.
8. Barros G, Duran P, Vera I, Bermúdez V. Exploring the Links between Obesity and Psoriasis: A Comprehensive Review. Int J Mol Sci. 2022. doi:10.3390/IJMS23147499.
9. Makrantonaki E, Jiang D, Hossini AM, Nikolakis G, Wlaschek M, Scharffetter-Kochanek K et al. Diabetes mellitus and the skin. Reviews in Endocrine and Metabolic Disorders 2016 17:3. 2016;17:269–82.
10. Selim S, Lona H, Sikder MdS. Dermatological Manifestations in Diabetes. J Ban Acad Dermatol. 2022;2:22–40.
11. Rachfal AW, Grant SFA, Schwartz SS. The Diabetes Syndrome – A Collection of Conditions with Common, Interrelated Pathophysiologic Mechanisms. Int J Gen Med. 2021;14:923.
12. Holm JG, Thomsen SF. Type 2 diabetes and psoriasis: links and risks. Psoriasis: Targets and Therapy. 2019;9:1–6.
13. Guo Z, Yang Y, Liao Y, Shi Y, Zhang L. Emerging Roles of Adipose Tissue in the Pathogenesis of Psoriasis and Atopic Dermatitis in Obesity. JID innovations : skin science from molecules to population health. 2021;2:100064.
14. Kiluk P, Baran A, Kaminski TW, MacIaszek M, Flisiak I. Decreased levels of vaspin and its potential association with cardiometabolic risk in patients with psoriasis: preliminary results. Postepy Dermatol Alergol. 2022;39:307–15.
15. Pollack RM, Donath MY, LeRoith D, Leibowitz G. Anti-inflammatory Agents in the Treatment of Diabetes and Its Vascular Complications. Diabetes Care. 2016;39:S244–52.
16. Mehta NN, Azfar RS, Shin DB, Neimann AL, Troxel AB, Gelfand JM. Patients with severe psoriasis are at increased risk of cardiovascular mortality: cohort study using the General Practice Research Database. Eur Heart J. 2010;31:1000–6.

17. Daiber A, Chlopicki S. Revisiting pharmacology of oxidative stress and endothelial dysfunction in cardiovascular disease: Evidence for redox-based therapies. Free Radic Biol Med. 2020;157:15–37.

18. Meng Z, Liu X, Li T, Fang T, Cheng Y, Han L et al. The SGLT2 inhibitor empagliflozin negatively regulates IL-17/IL-23 axis-mediated inflammatory responses in T2DM with NAFLD via the AMPK/mTOR/autophagy pathway. Int Immunopharmacol. 2021. doi:10.1016/J.INTIMP.2021.107492.

19. Kim SR, Lee SG, Kim SH, Kim JH, Choi E, Cho W et al. SGLT2 inhibition modulates NLRP3 inflammasome activity via ketones and insulin in diabetes with cardiovascular disease. Nat Commun. 2020. doi:10.1038/S41467-020-15983-6.

20. Sakaeda T, Kobuchi S, Yoshioka R, Haruna M, Takahata N, Ito Y et al. Susceptibility to serious skin and subcutaneous tissue disorders and skin tissue distribution of sodium-dependent glucose co-transporter type 2 (SGLT2) inhibitors. Int J Med Sci. 2018;15:937.

21. Chen-Yi W, Ma S-H, Wu C-Y, Lyu Y-S, Chou Y-J, Chang Y-T et al. Association between sodium-glucose co-transporter 2 inhibitors and risk of psoriasis in patients with diabetes mellitus – a nationwide population-based cohort study. Clin Exp Dermatol. 2022. doi:10.1111/CED.15385.

22. Boccardi A, Shubrook JH. Cutaneous Reactions to Antidiabetic Agents: A Narrative Review. Diabetology 2022, Vol. 3, Pages 97-107. 2022;3:97–107.