

Impact of thiazide diuretics on glycemic control Evidence-based review

Carolina Reis¹, Cristiana Craveiro², Tânia Tavares³, Miguel Pisco⁴, Miguel Pires⁵

¹USF Santo António da Charneca, Portugal, carolina_reis25@hotmail.com

²USF Santo António da Charneca, Portugal, cristianaalc@gmail.com

³USF Ribeirinha, Portugal, tania_clt@hotmail.com

⁴USF Ribeirinha, Portugal, miguelppgomes@gmail.com

⁵USF Santo António da Charneca, Portugal, miguel.pires.mgf@gmail.com

ABSTRACT

BACKGROUND: Hypertension is a frequent comorbidity in the diabetic population. Thiazide (TZ) diuretics are one of the pharmacological classes mostly used in the treatment of hypertension. Thus, it is important to understand their impact on glycemic control. **OBJECTIVE:** The objective of this study is to review the current clinical evidence regarding this topic. **METHODS:** Search for systematic reviews (SR), meta-analyses (MA) and randomized clinical trials (RCT), published in the last 5 years, that include “thiazide” and “diabetes mellitus” as MeSH terms. Selected databases: Medline, Cochrane, NHS evidence and BMJ. The articles were further selected based on their title and/or abstract. The recommendation strength was evaluated according to the SORT scale (American Family Physician). P.I.C.O. was defined as follows: Population - hypertensive, with or without diabetes, under treatment with TZ diuretics; Intervention - antihypertensive treatment with TZ diuretic; Control - No antihypertensive treatment with TZ diuretic; Outcomes - Glycemic control, new diagnosis of diabetes. **RESULTS:** Our initial search resulted in the selection of 136 articles, of which six were included in this review (3 meta-analyses and 3 randomized clinical trials). Meta-analyses suggest that the use of hydrochlorothiazide (HTZ) is associated with poor glycemic control, with fewer changes concerning fasting blood glucose occurring in patients receiving lower TZ doses^[1,2]. Randomized clinical trials suggest that: (i) association of TZs with angiotensin II receptor antagonists, or calcium channel blockers, does not result in metabolic changes^[3]; (ii) the use of TZ diuretics is not associated with higher de novo diagnoses of diabetes^[4]; (iii) and, finally, that the combination of amiloride with HTZ might improve metabolic control versus the use of HTZ alone^[5]. **CONCLUSIONS:** The current clinical evidence suggests that TZ diuretics may interfere with glycemic control in diabetic patients - however, lower doses seem to induce weaker, non-deleterious, changes in glucose levels (FR C). We conclude that there is insufficient evidence to contraindicate the use of TZ diuretics in diabetic patients (FR C).

Keywords: *thiazide diuretics; diabetes mellitus*

References:

- [1] Hirst J, et al. Quantifying the effects of diuretics and β -adrenoceptor blockers on glycaemic control in diabetes mellitus – a systematic review and meta-analysis. *British Journal of Clinical Pharmacology*. 2015; 79(5): 733-43.
- [2] Zhang X, Zhao Q. Association of Thiazide-Type Diuretics With Glycemic Changes in Hypertensive Patients: A Systematic Review and Meta-Analysis of Randomized Controlled Clinical Trials. *The Journal of Clinical Hypertension*; 2016. 18(4): 342-51.
- [3] Spinar, J et al. Anti-hypertensive strategies in patients with MEtabolic parameters, DIabetes mellitus and/or NEphropAthy (the M E D I N A study). *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub*. 2014; 158(3): 412-21.
- [4] Ueda S, et al. A randomised controlled trial for the evaluation of risk for type 2 diabetes in hypertensive patients receiving thiazide diuretics: Diuretics In the Management of Essential hypertension (DIME) study. *BMJ Open*. 2014; 16;4(7): e004576.
- [5] Brow MJ, et al. Effect of amiloride, or amiloride plus hydrochlorothiazide, versus hydrochlorothiazide on glucose tolerance and blood pressure (PATHWAY-3): a parallel-group, double-blind randomised phase 4 trial. *Lancet Diabetes Endocrinology*. 2016 Feb; 4(2): 136-47.