proceedings

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Abstract

Diurnal Differences in Glycaemic Responses to Meals Containing Different Bread Types among Persons at Risk for Type 2 Diabetes—Preliminary Results from a CarbHealth Sub-Study †

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† Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Background and Objectives: Insulin sensitivity has been shown to decrease during the day among persons at risk of type 2 diabetes (T2DM). It remains to be established whether this also results in differences in glycaemic response to meals rich in carbohydrates, e.g., bread meals. Hence, we determined whether diurnal differences between morning and evening meals containing breads could be observed among persons at risk of T2DM consuming different breads as part of their habitual diet. Methods: Analysis based on data from a multicentre randomised controlled trial (CarbHealth) conducted among participants with prediabetes at four study sites (Germany, Norway, Sweden) who received either a ß-glucan-enriched bread or a non-enriched wholegrain control bread to replace their habitually consumed bread for 16 weeks. In Paderborn, Germany, participants wore a continuous glucose monitoring device during weeks 1 and 16. The incremental area under the curve (iAUC) in the two hours following a bread meal in the morning or evening was determined and compared using a *t*-test. Morning bread meals were defined as meals consumed between 06.00 and 11.00 a.m., and evening bread meals referred to meals consumed between 05.00 and 10.00 p.m. Results: Out of 47 participants, 20 and 13 who consumed ß-glucan-enriched bread or wholegrain bread as part of their meals both in the morning and evening were considered. In persons consuming the ß-glucan bread, the iAUC of evening bread meals was higher than in morning bread meals in week 1 only (evening 2 h iAUC = 1561 [±760] mg/dL vs. morning 2 h iAUC = 1181 [±500] mg/dL, $p = 0.03$). In the control bread-group, the iAUC was higher in evening bread meals than in morning bread meals in week 16 (evening 2 h iAUC = 2445 [±1894] mg/dL vs. morning 2 h iAUC = 1764 [±1314] mg/dL, $p = 0.04$). Discussion: These preliminary data from a small sample of persons with prediabetes indicate that diurnal differences in carbohydrate consumption may extend to the context of habitual carbohydrate-rich meals. If replicated, persons at risk of T2DM should be discouraged from consuming large amounts of bread in the evening.

Keywords: glycaemic response; prediabetes; bread

Citation: Schadow, A.M.; Gartner, M.; Stutz, B.; Krueger, B.; Dierkes, J.; Buyken, A.E. Diurnal Differences in Glycaemic Responses to Meals Containing Different Bread Types among Persons at Risk for Type 2 Diabetes—Preliminary Results from a CarbHealth Sub-Study. *Proceedings* **2023**, *91*, 181. https://doi.org/10.3390/proceedings2023091181

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 2 February 2024

Author Contributions: Conceptualization, A.M.S. and A.E.B.; formal analysis, A.M.S. and M.G.; data curation, A.M.S., B.S. and B.K.; writing—original draft preparation, A.M.S. and M.G.; writing—review and editing, A.M.S. and A.E.B.; project administration, J.D.; funding acquisition, A.E.B. and J.D. All authors have read and agreed to the published version of the manuscript.

Funding: This project has received funding from the European Joint Programming Initiative "A Healthy Diet for a Healthy Life" (JPI HDHL) and of the ERA-NET Cofund HDHL INTIMIC (GA N° 727565 of the EU Horizon 2020 Research and Innovation Programme).

Institutional Review Board Statement: The study protocol was approved by the respective ethic authorities (Swedish Ethical Review Authority, Sweden (protocol DNR 2021–02584), ethical committee of Paderborn University, Paderborn (approved 13 July 2021), ethical committee of the medical faculty of the University of Leipzig, Leipzig (316/21-ek) and regional committees for Medical and Health Research Ethics, Norway (REC Nord, ref. 106931)).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets presented in this article are not readily available because the data are part of an ongoing study. Requests to access the datasets should be directed to the correspondence author.

Conflicts of Interest: Anette Buyken is a member of the ICQC.