Diabetes and Obesity Bias: Are We Intensifying the Pharmacological Treatment in Patients With and Without Obesity With Equity?

Diabetes Care 2021;44:e206–e208 | https://doi.org/10.2337/dc21-1294

Janine Alessi,[1,2]
Giovana B. de Oliveira,[3]
Isadora Nunes Erthal,[3]
Julia Belato Teixeira,[3]
Gabriela D.L.G. Scherer,[3]
Eduarda Herscovitz Jaeger,[3]
Josiane Schneiders,[1]
Guilherme H. Telo,[4]
Beatriz D. Schaan,[1,5,6] and
Gabriela H. Telo[3,4,7]

The impact of obesity on health is reflected in different spheres and includes not only metabolic consequences, such as type 2 diabetes, but also psychological consequences related to obesity stigma. Studies show that almost 40% of adults with obesity are discriminated against because of their weight (1). Weight-based stereotypes may interfere with health care decision-making in these patients (2). However, for effective management of diabetes, obesity, and associated comorbidities, health professionals must be free from cognitive bias. To better understand the scope of this problem in clinical practice, we evaluated the prevalence of pharmacological diabetes treatment intensification based on weight status.

This is a cross-sectional study of patients with type 2 diabetes who received outpatient care in Southern Brazil from October 2011 to December 2019. The study was approved by the institutional review boards. Participants who had a regular follow-up for ≥1 year, were aged ≥18 years, and had ≥2 measurements of HbA_{1c} in the period were considered eligible. Participants were randomly selected and then stratified into two groups according to BMI: obesity (BMI ≥30.0 kg/m^2) and without obesity (<30.0 kg/m^2).

The primary outcome was the adequacy of pharmacological treatment intensification between groups, based on individualized glycemic targets. For participants under 65 years old and without major comorbidities, the HbA_{1c} target of <7.0–7.5% (<53–58 mmol/mol) was used. For those aged 65 or over and with major comorbidities, the Deyo-Charlson comorbidity index score was used to categorize patients into three subgroups based on the score for each comorbidity and age (3). To assess whether the provision of medical care was similar between the groups, multiple diabetes care quality indicators were evaluated. A multivariable logistic regression model was used to control for possible confounders in the interaction between the primary outcome and interest groups.

Centers involved in this study included Hospital São Lucas da Pontifícia Universidade Católica do Rio Grande do Sul (HSL PUCRS), Hospital de Clínicas de Porto Alegre (HCPA), Basic Health Unit and Family Health Strategy of Institute of Retirements and Pensions for Industrial Workers (IAPI).

The study was approved by the Research Ethics Committee of HSL PUCRS (no. 3.803.681), and the Research Ethics Committee of HCPA (no. 2016-0286), as well as in the Basic Health Unit and Family Health Strategy of IAPI (approved by the National Health Council in accordance with resolution 466/12, and by the Porto Alegre Municipal Health Office).

The data collected for the study, including de-identified participant data, will be available after publication of the article upon justified request and with a signed data access agreement.

According to the sample size calculation, 402 participants were included in this study. Most baseline characteristics were similar among patients without obesity (n = 198) and those with obesity (n = 204) (Table 1). Patients without obesity were older (68.7 ± 9.0 vs. 65.2 ± 8.9 years old, P < 0.001), and fewer used insulin (66.7% vs. 49.5%, P < 0.001) than patients with obesity. Both groups were similar regarding all

[1]*Postgraduate Program in Endocrinology, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*
[2]*Endocrinology Divison, Hospital São Lucas – Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil*
[3]*School of Medicine, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil*
[4]*Medicine and Health Sciences Graduate Program, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil*
[5]*School of Medicine, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*
[6]*Endocrinology Division, Hospital de Clínicas de Porto Alegre, Porto Alegre, Brazil*
[7]*Internal Medicine Division, Hospital São Lucas – Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil*

Corresponding author: Janine Alessi, janinealessi@gmail.com

Received 21 June 2021 and accepted 23 September 2021

Table 1—Participant demographics and clinical characteristics, and outcomes of the study according to weight status

	Total (N = 402)	Without obesity group (n = 198)	Obesity group (n = 204)	P value
Age (years)	66.9 ± 9.1	68.7 ± 9.0	65.2 ± 8.9	<0.001
Sex (female)	225 (56.0)	102 (51.5)	123 (60.3)	0.08
Race/ethnicity (White)	349 (86.8)	178 (89.9)	171 (83.8)	0.07
Diabetes complications				
Retinopathy	92 (22.9)	42 (21.2)	50 (24.5)	0.43
Neuropathy	45 (11.2)	23 (11.6)	22 (10.8)	0.79
Nephropathy	109 (27.1)	53 (26.8)	56 (27.5)	0.91
Insulin use	234 (58.2)	98 (49.5)	136 (66.7)	<0.001
Metformin use	375 (93.5)	184 (93.4)	191 (93.6)	0.92
Sulfonylurea use	211 (52.5)	111 (56.1)	100 (49.0)	0.16
Hypoglycemia§	41 (10.2)	17 (8.6)	24 (11.8)	0.29
Hypertension	357 (88.8)	169 (85.4)	188 (92.2)	0.03
Deyo-Charlson comorbidity index (%)				0.20
1 point	146 (36.3)	67 (33.8)	79 (38.7)	
2 points	134 (33.3)	67 (33.8)	67 (32.8)	
3 points	46 (11.4)	24 (12.1)	22 (10.8)	
≥4 points	76 (18.7)	40 (20.3)	36 (17.7)	
Quality indicators for diabetes care				
Number of medical appointments*		4.0 (3.0, 5.0)	3.0 (3.0, 5.0)	0.21
HbA_{1c}† (%)		8.2 ± 1.9	8.1 ± 1.7	0.67
HbA_{1c} (mmol/mol)		66.0 ± 20.8	65.0 ± 18.6	
Assessment of albuminuria and/or creatinine*		151 (76.3)	145 (71.1)	0.24
Assessment of lipid profile*		149 (76.3)	138 (67.6)	0.51
Assessment of sensory neuropathy*		63 (31.8)	67 (32.8)	0.83
Assessment of retinopathy*		62 (31.3)	79 (38.7)	0.12
Nutritional assessment*		46 (23.2)	48 (23.5)	0.94
Inquiry about smoking§		20 (10.1)	17 (8.3)	0.54
Primary Outcome				
Patients with HbA_{1c} above the target‡	181 (45.0)	86 (43.4)	95 (46.6)	0.53
Patients who received appropriate treatment intensification¶	109 (60.2)	58 (67.4)	51 (53.7)	0.05

Data are mean ± SD, median (interquartile range), or n (%). HbA_{1c}, hemoglobin A_{1c}. §According to data registered in medical records. *In relation to a 1-year period of follow-up. †Last test available on medical records. ‡HbA_{1c} target: for participants under 65 years old and without major comorbidities, the HbA_{1c} target of <7.0–7.5% (<53–58 mmol/mol) was used. For those aged 65 or over and with major comorbidities, the Deyo-Charlson comorbidity index score (CCIS) was used to categorize patients into three subgroups based on the score for each comorbidity and age (3): younger and healthier participants (age range between 65 and 79 years and CCIS 1), younger participants who are slightly ill (age range between 65 and 79 years and CCIS 2 or 3), and older and sicker participants (age range under 80 years and CCIS 4 or greater, or age above 80 years and CCIS 1 or greater). ¶The proportion of patients who had HbA_{1c} above the target and who received appropriate treatment intensification. P values indicate a comparison between patients without obesity and with obesity. An $\alpha \leq 0.05$ indicates a significant difference between groups.

quality indicators for diabetes care. According to individualized glycemic targets, 43.4% of the participants without obesity and 46.6% with obesity presented with an HbA_{1c} level above the target (P = 0.53). When assessing the number of patients who received pharmacological treatment intensification when HbA_{1c} level was above the target, it was found that participants from the group without obesity more frequently received treatment intensification than those from the obesity group (67.4% vs. 53.7%, respectively, P = 0.05). Moreover, in a sensitivity analysis considering the HbA_{1c} target of ≤7.0% (≤53 mmol/mol) for individuals younger than 65 years and without major comorbidities, 15.2% in the group without obesity and 25.0% in the group with obesity failed to receive intensification of treatment when indicated (P = 0.01). Adjusted analyses, correcting for complexity of care level, age, HbA_{1c}, hypoglycemia, insulin use and hypertension, also showed that the obesity group more frequently failed in receiving pharmacological treatment intensification when required (odds ratio 1.87, 95% CI 1.02–3.45).

Our results suggest that patients with obesity may be more vulnerable to therapeutic inertia in the treatment of diabetes. Despite presenting an increased risk of diabetes complications and unfavorable outcomes, we found that patients with obesity more frequently fail to receive pharmacological treatment intensification when necessary. Some factors may explain the delay in intensifying

treatment in these patients. First, many effective agents that reduce glycemia may result in weight gain (4), and this may lead to a delay in the introduction of other drugs to the pharmacological treatment. Indeed, this may have been one of the limitations of the antihyperglycemic agents used in this study population. Second, the importance of lifestyle changes and weight loss as part of treatment for these patients (4) may delay the pharmacological intensification by physicians while insisting only on lifestyle changes. Also, newer glucose-lowering medications that promote weight loss, such as glucagon-like peptide 1 receptor agonists and sodium–glucose-cotransporter 2 inhibitors, although currently available, have a high cost and are inaccessible to most of the population in developing countries (5). Furthermore, the stigma of obesity has the potential to disrupt the health process and prevent many professionals from providing high-quality care to these patients (2).

The mental processes and cognitive biases that guide medical decision-making when treating patients with obesity are still poorly studied and not fully understood. Despite this, our findings suggest that patients with obesity may have some of their disease aspects neglected and that the limits of glycemic control in patients with type 2 diabetes and obesity are more permissive, which reflect the need to carefully revisit therapeutic decisions in these patients.

Funding. This work was conducted with support from the Research Incentive Fund (FIPE/HCPA), Postgraduate Program in Endocrinology Health Sciences at the Universidade Federal do Rio Grande do Sul, School of Medical Sciences at the Pontifícia Universidade Católica do Rio Grande do Sul, and Hospital São Lucas da Pontifícia Universidade Católica do Rio Grande do Sul. This study was funded in part by the Coordination for the Improvement of Higher Education Personnel – Brasil (CAPES) - Finance Code 001.

Duality of Interest. No potential conflicts of interest relevant to this article were reported.

Author Contributions. J.A. contributed to conceptualization, methodology, data curation, and writing and original draft preparation. G.B.d.O., I.N.E., J.B.T., G.D.L.G.S., E.H.J., and J.S. contributed to methodology and writing and original draft preparation. B.D.S. contributed to supervision and writing, reviewing, and editing. G.H.T. contributed to conceptualization, methodology, supervision, and writing, reviewing, and editing. All authors have reviewed the final version of the manuscript and agree with the publication of the results presented. J.A. is the guarantor of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

References

1. Wu Y-K, Berry DC. Impact of weight stigma on physiological and psychological health outcomes for overweight and obese adults: a systematic review. J Adv Nurs 2018;74:1030–1042
2. Puhl RM, Luedicke J, Grilo CM. Obesity bias in training: attitudes, beliefs, and observations among advanced trainees in professional health disciplines. Obesity (Silver Spring) 2014;22:1008–1015
3. Alessi J, Telo GH, de Oliveira GB, Schneiders J, Zanella MJB, Schaan BD. The rational treatment of diabetes mellitus in older adults: the adequacy of treatment decisions based on individualized glycemic targets in primary and tertiary care. J Diabetes Complications 2021;35:107835
4. Hurren KM, Dunham MW. Understanding the impact of commonly utilized, non-insulin, glucose-lowering drugs on body weight in patients with type 2 diabetes. Expert Opin Pharmacother 2018;19:1087–1095
5. Luo J, Feldman R, Rothenberger SD, Hernandez I, Gellad WF. Coverage, formulary restrictions, and out-of-pocket costs for sodium-glucose cotransporter 2 inhibitors and glucagon-like peptide 1 receptor agonists in the Medicare Part D program. JAMA Netw Open 2020;3:e2020969