

Management and treatment goals in Polish patients with type 2 diabetes of short duration: results of the ARETAEUS2-Grupa study

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KEY WORDS

clinical practice
guidelines, control,
cross-sectional study,
type 2 diabetes

ABSTRACT

INTRODUCTION In 2011, the Diabetes Poland updated its recommended goals in diabetes treatment, including hemoglobin A_{1c} (HbA_{1c}) and blood pressure (BP) levels. Adherence to the updated guidelines has not been systematically assessed so far.

OBJECTIVES The aim of the study was to assess which methods are most commonly used in the treatment of recently diagnosed type 2 diabetes and to what extent the new criteria for diabetes control are met in these patients.

PATIENTS AND METHODS The ARETAEUS2-Grupa study was a cross-sectional questionnaire-based study conducted in Poland in 2012 (April–June). It involved 1636 patients of any age and sex, with type 2 diabetes diagnosed within the previous 2 years, recruited by randomly selected physicians.

RESULTS Of all patients, 37.5% met the goal of an HbA_{1c} level of ≤6.5% (recommended in type 2 diabetes of short duration), while 62% met the goal of an HbA_{1c} level of ≤7% (general recommendation). Only 6.7% of the patients met all 3 goals (HbA_{1c} ≤6.5%, BP <140/90 mmHg, and low-density lipoprotein cholesterol <100 mg/dl or <70 mg/dl in coronary heart disease), 29.7% met 2 goals, 36.8% met only 1 goal, while 26.7% did not meet any of the treatment goals. With the use of the HbA_{1c} level recommended for the overall population, the proportions of patients meeting 3, 2, and 1 goals increased to 11%, 34.5%, and 35.5%, respectively, while the percentage of the patients not meeting any goals decreased to 18%. Metformin in monotherapy or in combination was the most commonly used drug in the study population (80%).

CONCLUSIONS The majority of the patients with type 2 diabetes of short duration did not meet any of the treatment goals as recommended in the current practice guidelines. When the treatment goals were used for the overall population (HbA_{1c} ≤7%), a slightly higher, but still unsatisfactory, proportion of the patients met all the treatment goals. Metformin alone or in combination was the most commonly used drug in the study population.

INTRODUCTION Type 2 diabetes is a leading cause of cardiovascular disease, including coronary heart disease (CHD) and stroke, as well as of adult blindness, kidney failure, and nontraumatic

lower limb amputations.^{1,2} The UKPDS Study demonstrated that early intensive diabetes treatment is beneficial and reduces long-term risk of cardiovascular events and mortality.^{3–5} It is estimated

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Received: July 18, 2013.

Revision accepted: September 16,
2013.

Published online: September 16,
2013.

Conflict of interest: The study was
funded by unrestricted educational
grant from TEVA Pharmaceuticals
Poland. The company had no role
in the design of the questionnaire
or in the collection, analysis, and
interpretation of the data.

Pol Arch Med Wewn. 2013;

123 (11): 573-581

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* under the patronage of Diabetes
Poland

that 6.8% of the Polish population has diabetes⁶; in many cases, the disease is associated with increased risk of complications because of delayed diagnosis and treatment. The ARETAEUS1 study, conducted in 2009, showed that a high proportion of patients with type 2 diabetes of short duration had cardiovascular risk factors and late diabetic complications. In addition, most patients (51%) did not meet any of the major treatment goals.⁷⁻⁹ The Diabetes Poland, a national association of physicians and other health care professionals involved in the care of diabetic patients, publishes new practice guidelines every year; since 2009, glycated hemoglobin (HbA_{1c}) and blood pressure (BP) treatment goals have changed, and there is a tendency in the national and international diabetes practice guidelines to call for a more patient-centered approach.¹⁰⁻¹² Regular monitoring of treatment goals (HbA_{1c}, BP, and lipid profile) as well as regular and thorough examination of patients are particularly important in optimizing the management of hyperglycemia and associated conditions in their early stages. However, in Poland, still a significant proportion of physicians do not determine HbA_{1c} levels according to the recommendations and a high percentage of the patients do not know anything about this marker of diabetes control.¹³

PATIENTS AND METHODS **The aims of the study** ARETAEUS2 was a cross-sectional questionnaire-based study conducted in Poland (April–June 2012). The aims of the study were: 1) to assess the methods of diabetes treatment used by Polish physicians and 2) to assess the degree to which the criteria for diabetic control recommended by the 2012 Diabetes Poland clinical practice guidelines¹⁰ are met (2012 recommendations are consistent with those published in 2013).¹¹ The ARETAEUS2 study had 2 arms: ARETAEUS2-Grupa and ARETAEUS2-Market. Those 2 arms used different recruitment methods. This paper reports on patients with type 2 diabetes of short duration participating in the ARETAEUS2-Grupa study.

Inclusion criteria We included patients of any age and sex who were diagnosed with type 2 diabetes within the previous 2 years (after April 1, 2010). Diabetes was diagnosed using the widely accepted glycemic criteria, which are consistent with the criteria of the American Diabetes Association,¹⁴ but not the HbA_{1c} criteria, which have not been accepted by the Diabetes Poland yet.^{10,11}

Recruitment of clinicians and their patients We invited a random sample of non-diabetologists (mainly working in primary health care) and, using a separate set, of diabetologists (specialists or physicians under training in diabetology, working in diabetes outpatient clinics) to participate in the study. Random samples were drawn from a database containing the data of about 85%

of all physicians practicing in Poland. Random selection was stratified according to the size of the place of residence (5 categories). Each physician received a letter explaining the study goals and patient inclusion criteria together with short questionnaires (described below) to be completed for each eligible patient. Physicians were asked to recruit at least 5 patients with type 2 diabetes of up to 2-year duration. Patients were selected on a pseudo-random basis, that is, the first 2 patients fulfilling the inclusion criteria from all patients scheduled for a given day.

Physicians who were not able to enroll at least 3 patients during 6 weeks were excluded from the study and replaced by other randomly selected clinicians. Physicians participating in the study received gratification for completing the questionnaires (medical books, participation in medical conference, or payment). The representative sample size of 240 physicians was calculated in Statcalc of EPIINFO v. 6.0 (for random sampling in population survey or descriptive study) based on the assumption of 95% confidence level, expected participation rate of 20%, and the general population of 10,000 physicians.

Questionnaire The questionnaire consisted of 2 parts and no question allowed to identify personal data. It was completed by a physician participating in the study. The first part concerned the physician (9 questions regarding years from graduation, specialization, the mean number of patients with diabetes seen per week, and the availability of the HbA_{1c} test on the day of visit). The second part consisted of 24 patient-related questions including sex, age, duration of diabetes, medical history (cardiovascular events; according to the report of a participating physician: CHD-related – acute coronary syndrome or stable coronary disease – and cerebrovascular disease-related – stroke or transient ischemic attack), hypertension and lipid disorders (both according to the report of a participating physician based on the current criteria outlined in clinical practice guidelines), history of cancer, and diabetic complications (according to the report of a participating physician: retinopathy, nephropathy, and diabetic foot), weight, height, test results (blood pressure, HbA_{1c}, and lipid levels), cigarette smoking status, as well as details on the use of antidiabetic, antihypertensive, hypolipemic, and antiplatelet drugs (details of hyperlipidemia and hypertension treatment will be reported in a separate publication).

Statistical methods To compare the proportions of patients achieving treatment goals in the subgroups, we used the χ^2 test or Fischer's exact test (when the expected values in any of the cells of a contingency table were below 5). For the comparison of the means, the *t* test was used (for normal distribution), and the Mann–Whitney *U* test and Kruskal–Wallis test (for nonnormal distribution of the variable). The distribution was

TABLE 1 Characteristics of the patient population with type 2 diabetes of short duration

Variable		Value
sex, (n = 1583)	female	55.2 (874)
	male	44.8 (709)
age, y (n = 1621)		60.9 ± 11.4
time from diabetes diagnosis, mo (n = 1634)		13 ± 7.6
diabetes duration, % (n)	less than 1 year	46 (752)
	more than 1 year	54 (882)
BMI, kg/m ² (n = 1623)		29.9 ± 4.9
HbA_{1c}, % (n = 1060)		6.8 (1)^a
lipid disorders ^b , (n = 1616)		73.3 (1184)
total cholesterol, mg/dl (n = 1502)		203 ± 47
LDL cholesterol, mg/dl	patients without CHD (n = 908)	122 ± 39
	patients with CHD (n = 353)	112 ± 38^c
HDL cholesterol, mg/dl	females (n = 692)	50 (18) ^a
	males (n = 571)	45 (15) ^a
triglycerides, mg/dl (n = 1436)		150 (78) ^a
hypertension ^b , (n = 1630)		80.2 (1307)
systolic BP/diastolic BP, mmHg (n = 1625)		135 ± 14.5/81 ± 9
current smokers, (n = 1550)		19.9 (309)
history of ACS ^b , (n = 1616)		10.2 (165)
history of stable CHD ^b , (n = 1602)		22.8 (365)
history of stroke ^b , (n = 1612)		3.5 (56)
history of TIA ^b , (n = 1610)		4.0 (65)
history of cancer ^b , (n = 1597)		5.2 (83)

Data are presented as percentage (number), mean ± standard deviation, or median (interquartile range).

a median (interquartile range)

b according to the physician report

c significant difference between the subgroups ($P = 0.000$)

Items in bold type were assessed as treatment goals.

Abbreviations: ACS – acute coronary syndrome, BMI – body mass index, BP – blood pressure, CHD – coronary heart disease, HbA_{1c} – hemoglobin A_{1c}, HDL – high-density lipoprotein, IQR – interquartile range, LDL – low-density lipoprotein, SD – standard deviation, TIA – transient ischemic attack

TABLE 2 Glycemic control in patients with type 2 diabetes of short duration

Glycemic control	Total (n = 1060) ^a	After excluding patients with a history of cancer or aged over 80 years (n = 935) ^a
HbA _{1c} ≤ 6.5%	37.5 (398)	37.0 (346)
HbA _{1c} > 6.5%	62.5 (662)	63.0 (589)
HbA _{1c} ≤ 7%	61.9 (656)	61.1 (571)
HbA _{1c} > 7%	38.1 (404)	38.9 (364)

Data are presented as percentage (number).

a total number of valid responses

Abbreviations: see [TABLE 1](#)

estimated on the basis of skewness coefficient and graphical picture. The t test for equal or non-equal variances was used depending on the result of the Levene's test. All statistical analyses were conducted using SPSS v. 18.0.

RESULTS We contacted 721 non-diabetologists and 326 diabetologists, of whom 347 did not respond, 101 were excluded as ineligible, and 227 refused to participate (24.3% of non-diabetologists and 16% of diabetologists). Finally, of 250 non-diabetologists scheduled for inclusion, 234 agreed to participate, and 205 returned the questionnaire (participation rate of 82%). Of 150 diabetologists, 138 agreed to participate and 126 returned the questionnaire (participation rate of 84%). For details, see [APPENDIX FIGURE 1](#) (for Appendix, see the pdf version available online at www.pamw.pl).

Altogether, we received 1636 valid questionnaires from 331 physicians: 1017 from non-diabetologists and 619 from diabetologists. Of all participating physicians, 70% specialized in internal medicine, 38% in diabetology, and 35% in family medicine. Half of the physicians reported seeing 11 to 30 diabetic patients per week.

The characteristics of the patients, including the prevalence of cardiovascular risk factors, are presented in [TABLE 1](#).

Glycemic control In the total study population, 37.5% of the patients had HbA_{1c} levels of ≤ 6.5% and 62% had HbA_{1c} levels of ≤ 7% ([TABLE 2](#)). For HbA_{1c} distribution, see [APPENDIX FIGURE 2](#). Most patients had their HbA_{1c} levels measured 1 to 6 months before the study and, those who had the most recent HbA_{1c} measurement had the shortest diabetes duration ([APPENDIX TABLE 1](#)). Median HbA_{1c} levels decreased with the duration of diabetes; it was ≤ 7% for type 2 diabetes lasting > 3 months, but was not lower than the threshold of 6.5% in any of the subgroups with different diabetes duration. Also the percentage of the patients who met the glycemic goal (HbA_{1c} ≤ 6.5%) increased from 26% in those with diabetes lasting less than 1 month to 41% in those with diabetes lasting over 18 months ([TABLE 3](#)).

Types of diabetes treatment Pharmacological treatment was administered in 98% of the patients: 58% used 1 drug, 35% 2 drugs, and 7% more than 2 drugs. Most patients (42%) were treated with metformin in monotherapy, 24% with metformin and sulfonylurea, and 9% with sulfonylurea in monotherapy; other drug combinations are listed in [TABLE 4](#). Metformin and sulfonylurea monotherapies were more often used in patients with HbA_{1c} levels of 6.5% or lower, while all other treatments were more common in patients with HbA_{1c} levels exceeding 6.5%. A similar pattern of drug use was observed in patients with HbA_{1c} levels of 7% or lower vs. those with HbA_{1c} levels exceeding 7% ([APPENDIX TABLE 2](#)).

In the subgroups of patients divided according to the body mass index (BMI), the frequency of metformin monotherapy increased with an increase in BMI (from 31.4% to 45.6%), while the frequency of sulfonylurea and insulin monotherapies decreased with an increase in BMI (from 19.2% to 5.1% and from 13.5% to 5.1%,

TABLE 3 Glycemic control according to the duration of the disease in patients with type 2 diabetes of short duration (n = 1059)

Glycemic control	Diabetes duration				
	< 1 year ^b		> 1 year ^b		
HbA _{1c} ≤6.5%	31.6 (136)		41.6 (261)		
HbA _{1c} > 6.5%	68.4 (295)		58.4 (367)		
glycemic control	detailed categories of diabetes duration				
	< 1 month	1–3 months	> 3 to 6 months	> 6–18 months	> 18 months
HbA _{1c} , % ^a	7.35 (2)	7.25 (2)	6.91 (1)	6.8 (1)	6.7 (1)
HbA _{1c} ≤6.5% ^c	26.3 (5)	16.8 (17)	34.2 (39)	40.2 (174)	41.3 (162)
HbA _{1c} > 6.5% ^c	73.7 (14)	83.2 (84)	65.8 (75)	59.8 (259)	58.7 (230)

Data are presented as percentage (number) or median (interquartile range).

a median (interquartile range)

b differences between the subgroups with different duration of diabetes are statistically significant ($P = 0.001$)

c $P = 0.000$

respectively). Still in patients with the BMI less than 25 kg/m², metformin monotherapy was the most common regimen, followed by metformin with sulfonylurea, sulfonylurea monotherapy, and insulin monotherapy. Seventy percent of the patients with the BMI exceeding 30 kg/m² received metformin in monotherapy or with sulfonylurea (TABLE 4).

When drug use according to disease duration was analyzed, metformin was the most common drug in all the subgroups; however, with longer diabetes duration, the use of metformin with sulfonylurea increased (APPENDIX TABLE 3).

Patients with diabetes diagnosed more than a year before the study used more drugs than those diagnosed with diabetes less than a year before. The number of diabetic drugs used by patients increased with the duration of diabetes (APPENDIX FIGURE 3).

Treatment goals The data regarding treatment goals were available for 845 patients. In the total population, only 6.7% of all patients met all 3 treatment goals recommended for type 2 diabetes of short duration, 29.7% met 2 goals,

36.8% met 1 goal, and 26.7% did not meet any treatment goals (FIGURE 1). TABLE 5 and APPENDIX TABLES 4 and 7 present the results of subgroup analysis depending on the number (and type) of treatment goals met. In different subgroups, from 0% to 15% of the patients (usually below 10%) met all 3 treatment goals, and 6.7% to 48.9% did not meet any goals. Significant differences between the BMI subgroups were detected: more patients met all treatment goals in the low BMI subgroup, while more patients did not meet any goals in the highest BMI subgroup (men: BMI <25 kg/m², 11.4%; BMI 25–30 kg/m², 7.8%; BMI >30 kg/m², 2.7%; $P = 0.008$; women: BMI <25 kg/m², 15%, BMI 25–30 kg/m², 8.3%, BMI >30 kg/m², 5.3%; $P = 0.037$).

When we applied the HbA_{1c} goal as recommended for the overall population (7%), the percentages of the patients who met 3 and 2 goals increased to 11% and 34.8%, respectively, while fewer patients met only 1 goal (35.5%) or no goals (18%; APPENDIX FIGURE 4; APPENDIX TABLES 5–7).

Diabetic complications Approximately 60% of the patients were examined for diabetic

FIGURE 1 Proportions of patients with type 2 diabetes of short duration meeting treatment goals according to the Diabetes Poland guidelines 2012 Abbreviations: see TABLE 1

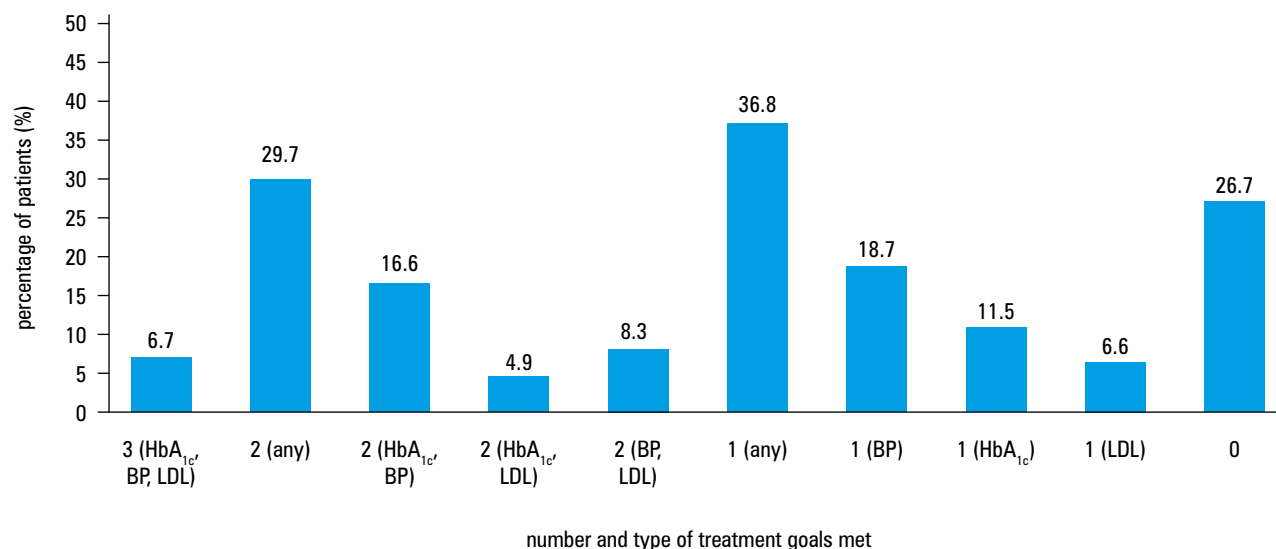


TABLE 4 Current diabetes treatment according to hemoglobin A_{1c} levels and body mass index in patients with type 2 diabetes of short duration

Exclusive drug categories	Overall (n = 1537) ^a	HbA _{1c} (n = 993)		BMI (n = 1524)		
		<6.5%	>6.5%	<25 (n = 229)	25–30 (n = 93)	>30 (n = 702)
no antidiabetic drugs	2.3 (36)	3.2 (12)	0.6 (4) ^b	2.6 (6)	2.5 (15)	2.0 (14)
metformin in monotherapy	42.3 (650)	53.8 (203)	30.7 (189) ^c	31.4 (72)	43.0 (255)	45.6 (320) ^d
metformin and SU	24.4 (375)	19.9 (75)	29.5 (182) ^c	20.5 (47)	26.0 (154)	24.2 (170)
metformin and insulin	5.7 (87)	2.7 (10)	10.2 (63) ^c	4.8 (11)	5.1 (30)	6.3 (44)
metformin and other drug (not SU or insulin)	3.4 (53)	1.6 (6)	5.0 (31) ^c	1.3 (3)	2.7 (16)	4.8 (34)
SU in monotherapy	9.4 (145)	9.0 (34)	7.0 (43) ^e	19.2 (44)	11.0 (65)	5.1 (36) ^c
SU and insulin	0.3 (4)	0	0.3 (2) ^f	0.9 (2)	0.3 (2)	0
SU and other drug (not metformin or insulin)	1.0 (15)	1.1 (4)	1.3 (8) ^g	2.2 (5)	1.0 (6)	0.6 (4)
insulin in monotherapy	5.8 (89)	4.8 (18)	7.5 (46) ^b	13.5 (31)	3.4 (20)	5.1 (36) ^h
other drugs or drug combinations	5.4 (83)	4.0 (15)	7.8 (48) ^h	3.5 (8)	5.1 (30)	6.3 (44)
drugs in monotherapy or combined	overall (n = 1614)	<6.5%	>6.5%	<25 (n = 243)	25–30 (n = 620)	>30 (n = 738)
metformin	80.5 (1300)	80.6 (316)	83.3 (543)	60.9 (148)	81.3 (504)	86.6 (639) ^c
SU	39.9 (639)	32.6 (127)	44.6 (287) ^c	45.0 (108)	43.0 (265)	35.7 (262) ⁱ
acarbose	5.9 (93)	5.4 (21)	6.4 (41)	5.1 (12)	5.0 (30)	6.9 (50)
insulin	15.1 (238)	9.4 (36)	23.9 (153) ^c	21.4 (50)	12.2 (74)	15.2 (110) ^e
GLP-1 agonist	0.6 (9)	0.3 (1)	1.1 (7)	0.4 (1)	0.2 (1)	1.0 (7)
DPP-4 inhibitor	1.5 (23)	0.5 (2)	2.4 (9)	0	1.5 (9)	2.0 (14)

Data are presented as percentage (number).

a total number of valid responses; **b** statistically significant differences between the subgroups (X² test); *P* = 0.003; **c** *P* = 0.000; **d** *P* = 0.006; **e** *P* = 0.004; **f** *P* = 0.005; **g** *P* = 0.008; **h** *P* = 0.001; **i** *P* = 0.005

Abbreviations: GLP-1 – glucagon-like peptide, DPP-4 – dipeptyl peptidase 4, SU – sulphonylurea, others – see [TABLE 1](#)

complications and the most commonly reported complication was retinopathy (11.5%). The proportion of the patients examined and diagnosed with diabetic complications is presented in [FIGURE 2](#).

DISCUSSION The ARETAEUS2-Grupa study provided updated information on risk factors, presence of diabetes complications, and management of patients with type 2 diabetes of short duration.

The current clinical practice guidelines^{9–11} call for setting individualized treatment plans and treatment goals for patients with type 2 diabetes based on patient-specific symptoms, disease progression, comorbidities, age, weight differences, and patients' preferences. Within the algorithm-based management, providers may choose the most appropriate treatment option and change it with the progression of the disease.

Compared with the ARETAEUS1 study,⁸ we observed differences in the use of drugs in patients with type 2 diabetes of short duration: in the overall population, more patients with type 2 diabetes of short duration received metformin in monotherapy (42.3% vs. 31.7%) and fewer patients received sulfonylurea in monotherapy (9.4% vs. 19%). In overweight and obese patients, those changes were even more apparent: metformin was used in monotherapy in 43% of overweight and in 45.6% of obese patients (as compared with 28.1% and 37.7% of such patients in

the ARETAEUS1 study). Although the percentages of overweight and obese patients receiving sulfonylurea in monotherapy improved compared with the ARETAEUS1 study, those drugs were still used in 11% of overweight and 5.1% of obese patients.

There are few epidemiological studies documenting the treatment and control of type 2 diabetes in Poland.^{15–21} The ARETAEUS1 study conducted in 2009 by the same group demonstrated that too many patients missed their target values of BP, glucose, and blood lipid levels (50.7% of the patients did not meet any of the treatment goals).⁸

In the current study, the median value of HbA_{1c} and mean BP were below the general thresholds recommended by the Diabetes Poland guidelines (≤7% and <140/90 mmHg), but the median HbA_{1c} was above the threshold of 6.5% adopted for patients with diabetes of short duration. Also the mean values of total and low-density lipoprotein (LDL) cholesterol were above the thresholds recommended by those guidelines (<175 mg/dl for total cholesterol, <100 mg/dl for LDL cholesterol, and <70 mg/dl for LDL cholesterol in patients with CHD).

Compared with the ARETAEUS1 study, more patients in ARETAEUS2-Grupa met glycemic treatment goal of HbA_{1c} ≤6.5% (37.5% vs. 28.9%) and HbA_{1c} ≤7% (62% vs. 49.6%). When we applied HbA_{1c} ≤7% as a target value in the whole

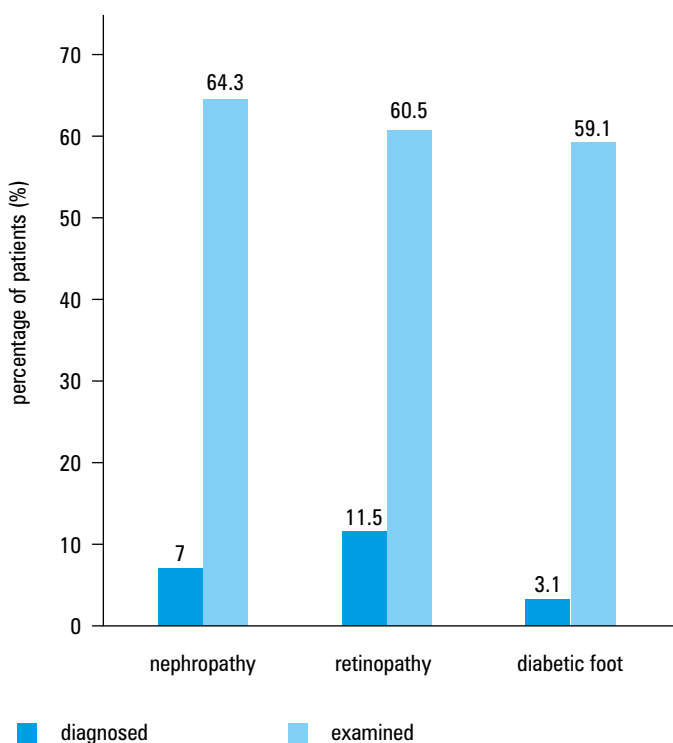


FIGURE 2 Proportion of patients examined and diagnosed with diabetic complications

population of the current study only 11.5% of the patients met all 3 treatment goals (HbA_{1c}, BP, and lipid profile), 34.5% met 2 goals, 35.5% met 1 goal, and 18% did not meet any of the treatment goals; in ARETAEUS1, the percentages for the target HbA_{1c} of $\leq 6.5\%$ were even less satisfactory (1.4%, 12.5%, 35.3%, and 50.7%, respectively).

The percentage of patients with HbA_{1c} of $\leq 6.5\%$ increased with the duration of diabetes and the median values of HbA_{1c} improved. It would be interesting to see the effect of diabetes management in the same patients after 3 and 6 months; however, this would require a different study design, namely, a cohort study.

Studies conducted in Europe and North America among patients with type 2 diabetes of different duration also showed that most patients not only do not meet their HbA_{1c} goal but also BP and cholesterol treatment goals.²²⁻²⁸

The most recent study was a survey conducted in the United States,²⁸ which showed improvements in diabetes control over 12 years; however, from 43% to 48% of the diabetic patients still did not achieve glycemic, BP, or lipid control and only 14.3% of the population met all the goals (HbA_{1c} $\leq 7\%$ and individualized goals, BP $< 130/80$ and LDL cholesterol < 100 mg/dl and < 70 mg/dl in those with CHD, and non-smoking status). In our study, when using the HbA_{1c} goal for the overall population, 11.5% of the population met all metabolic treatment goals. The frequency of annual eye and foot examination exceeded 70% of the diabetic patients in the United States; in our study, it was closer to 60%. However, the population in the United States survey included all diabetes durations with 36% of the patients with type 2 diabetes for up to 5 years, while

the ARETAEUS2-Grupa study included only patients with type 2 diabetes of short duration.

Our study included patients treated by diabetologists and non-diabetologists; however, we did not attempt to compare the patients between these 2 groups of physicians as this was not the aim of our study. Moreover, owing to the cross-sectional design of the ARETAEUS2-Grupa study, it would not be possible to determine the reason for the potential differences.

Diabetes of short duration is considered an indication for tighter diabetes control with HbA_{1c} goal of $\leq 6.5\%$ in the Diabetes Poland guidelines.^{10,11} Nevertheless, many patients with type 2 diabetes of short duration seem to already have advanced disease with some evident complications or diagnosed cardiovascular disease. The majority of the patients participating in the ARETAEUS2-Grupa study had hypertension and lipid disorders; a history of acute coronary syndrome was reported in 10.2% of the patients. After 3 months of treatment, over 30% of the patients required 2 antidiabetic drugs and 17% were treated with insulin, and in patients up to 18 months after the diagnosis, 2 drugs were used by 34%, 3 drugs by 6% of the patients, and 15% of the patients received insulin.

Patients with cardiovascular complications and major morbidity may have more advanced disease than that assumed by the date of diagnosis. Those patients were found to require insulin therapy more often than patients with no history of cardiovascular events (23.6% vs. 13.5%). Future prospective studies are needed to assess the risks and benefits of tighter vs. less strict glucose control in patients with type 2 diabetes of short duration but with different clinical characteristics, and they should also include an additional group of patients with screen detected diabetes. Until then, the main question is whether the individual approach to a patient with type 2 diabetes of short duration should be guided by the time from diagnosis only and aim at HbA_{1c} below 6.5%, or whether it should also consider the history of cardiovascular events and, therefore, allow to aim at HbA_{1c} of less than 7% from the beginning.

The Diabetes Poland guidelines recommend examining patients with type 2 diabetes for late diabetes complication since diagnosis (every year for nephropathy and retinopathy); however, in our study, only 60% of the patients underwent such examinations. The main question here is whether primary health care provides an access to recommended examinations for patients with type 2 diabetes of short duration, because such patients are rarely referred to diabetologists (mainly because the management of diabetes at an early stage is not so problematic).

The main limitation of our study is the cross-sectional data collection, which provided information about the quality of diabetes care over a very short period of the study duration. The same is true for the recorded values of

TABLE 5 Meeting treatment goals in patients with type 2 diabetes of short duration: subgroup analysis by treatment type

Subgroup	Number of patients in the subgroup ^a	Percentage of patients with treatment goals met			
		3 goals met (A, B, C)	2 goals met (excludes patients who met all 3 goals)	1 goal met (excludes patients who met more than 1 goal)	0 goals met (A, B, C, all not met)
BP <140/90 mmHg, LDL <100 mg/dl, or if CHD <70 mg/dl, HbA _{1c} ≤6.5%					
antidiabetic drugs	none (n = 15)	6.7 (1)	46.7 (7)	40.0 (6)	6.7 (1)
	any (n = 776)	7.1 (55)	28.7 (223)	36.9 (286)	27.3 (212)
metformin in monotherapy	yes (n = 313) ^b	11.5 (36)	38.3 (120)	30.0 (94)	20.1 (63)
	no (n = 463) ^b	4.1 (19)	22.2 (103)	41.5 (192)	32.2 (149)
	no drugs (n = 15) ^b	6.7 (1)	46.7 (7)	40.0 (6)	6.7 (1)
metformin and SU	yes (n = 201) ^c	3.5 (7)	21.4 (43)	41.8 (84)	33.3 (67)
	no (n = 575) ^c	8.3 (48)	31.3 (180)	35.1 (202)	25.2 (145)
	no drugs (n = 15) ^c	6.7 (1)	46.7 (7)	40.0 (6)	6.7 (1)
metformin and insulin	yes (n = 59)	3.4 (2)	15.3 (9)	49.2 (29)	32.2 (19)
	no (n = 717)	7.4 (53)	29.8 (214)	35.8 (257)	26.9 (193)
	no drugs (n = 15)	6.7 (1)	46.7 (7)	40.0 (6)	6.7 (1)
metformin and a drug other than SU and insulin	yes (n = 25)	8.0 (2)	12.0 (3)	40.0 (1)	40.0 (10)
	no (n = 751)	7.1 (53)	29.3 (220)	36.8 (276)	26.9 (202)
	no drugs (n = 15)	6.7 (1)	46.7 (7)	40.0 (6)	6.7 (1)
insulin in monotherapy	yes (n = 50)	4.0 (2)	30.0 (15)	38.0 (19)	28.0 (14)
	no (n = 726)	7.3 (53)	28.7 (208)	36.8 (267)	27.3 (198)
	no drugs (n = 15)	6.7 (1)	46.7 (7)	40.0 (6)	6.7 (1)
insulin and other drug	yes (n = 91) ^d	2.2 (2)	16.5 (15)	45.1 (41)	36.3 (33)
	no (n = 685) ^d	7.7 (53)	30.4 (208)	35.8 (245)	26.1 (179)
	no drugs (n = 15) ^d	6.7 (1)	46.7 (7)	40.0 (6)	6.7 (1)

Data are presented as percentage (number).

a includes only the patients for whom data on all treatment goals were available; **b** significant difference between the groups (X² test); $P = 0.000$; **c** $P = 0.003$; **d** $P = 0.007$

Abbreviations: A – HbA_{1c}, B – blood pressure, C – LDL cholesterol, others – see TABLES 1 and 2

the parameters used in the analysis of the treatment goals. Because the study included patients with different duration of diabetes (up to 1 month and over 18 months), the median values of the parameters may not be informative, especially in view of the recommended personalization of the therapy. This is why HbA_{1c} values and the rates of meeting treatment goals were also analyzed according to diabetes duration. We also ensured representativeness of the study sample by drawing it randomly from a database containing data on about 85% of all the physicians practicing in Poland with stratification according to the size of the place of residence and, separately, for diabetologists and non-diabetologists. In addition, we asked practitioners to select patients on a pseudo-random basis, that is, the first 2 patients fulfilling the inclusion criteria from all patients scheduled for a given day. This procedure should ensure that the patients included in our study reflect an average patient under the care of diabetologists or non-diabetologists.

Another limitation of the study is the lack of verification of data collected from the physicians. This means that the reliability of the data was dependent on the physicians, which may cause bias toward better results than they were in reality. If

we assume that such a bias was present, we may conclude that the degree of diabetes control might be even worse than that shown in our study.

The number of patients with known HbA_{1c} values is yet another limitation of our study. Only 65% of the patients (1060 of 1636) had HbA_{1c} values recorded. Moreover, most of them had their HbA_{1c} level measured 1 to 6 months before the study, and this period increased with the duration of diabetes. This shows that a significant proportion of the physicians do not determine HbA_{1c} levels according to the recommendations and that a high percentage of the patients does not know anything about this marker of diabetes control.¹³ This may hinder a reliable assessment of the quality of diabetes care in Poland.

There might be several reasons for such an unsatisfactory level of diabetes control, including difficult access to education, insufficient number of the nurses, restricted access to diabetes specialists or drugs, and insufficient understanding of the disease both by physicians and patients. Current guidelines on diabetes management call for cooperation between specialists in different medical fields because it is a complex disease with late complications and comorbidities requiring multidisciplinary knowledge and multidirectional

treatment. However, such cooperation requires a lot of effort from all involved parties.

In conclusion, we observed a number of favorable changes in the management of patients with type 2 diabetes of short duration in 2012 compared with the results obtained in 2009; however, adherence to the current practice guidelines still seems to be unsatisfactory. In our study population, metformin alone or in combination was the most commonly used drug.

Contributors All of the authors contributed to the study concept, design, and implementation, and to the content and development of this report.

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Acknowledgments We would like to thank the members of the ARETAEUS2 Scientific Committee not listed as the authors by name: Prof. Waldemar Banasiak MD, PhD; Prof. Maria Górka, MD, PhD; Prof. Władysław Grzeszczak MD, PhD; Prof. Maciej Małecki, MD, PhD; and Prof. Bogna Wierusz-Wysocka, MD, PhD. We would like to thank all the physicians participating in the study.

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Leczenie i spełnianie celów leczenia u polskich chorych na cukrzycę typu 2 o krótkim czasie trwania – wyniki badania ARETAEUS2-Grupa

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badanie przekrojowe,
cukrzyca typu 2,
kontrola, wytyczne
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STRESZCZENIE

WPROWADZENIE W 2011 r. Polskie Towarzystwo Diabetologiczne uaktualniło zalecane wartości docelowe w leczeniu cukrzycy dla hemoglobiny A_{1c} (HbA_{1c}) i ciśnienia tętniczego. Nie oceniano dotąd w sposób systematyczny stosowania się do uaktualnionych wytycznych.

CELE Badanie przeprowadzono w celu oceny najczęściej stosowanych metod leczenia krótkotrwałej cukrzycy typu 2 i określenia odsetka tych chorych spełniających uaktualnione kryteria kontroli cukrzycy.

PACJENCI I METODY Badanie ARETAEUS2-Grupa było przekrojowym badaniem kwestionariuszowym przeprowadzonym w Polsce w 2012 r. (kwiecień–czerwiec). Badaniem objęto 1636 chorych na cukrzycę typu 2 w każdym wieku i obu płci rozpoznaną w ciągu ostatnich 2 lat, włączonych do badania przez losowo wybranych lekarzy.

WYNIKI W całej populacji chorych na cukrzycę typu 2 37,5% spełniło kryterium kontroli HbA_{1c} ≤6,5% (zalecane w krótkotrwałej cukrzycy typu 2), a 62% – kryterium kontroli HbA_{1c} ≤7% (zalecenie ogólne). W całej populacji jedynie 6,7% chorych spełniło wszystkie 3 kryteria kontroli choroby (HbA_{1c} ≤6,5%, ciśnienie tętnicze <140/90, stężenie cholesterolu LDL <100 mg/dl i <70 mg/dl – jeśli występuje choroba wieńcowa), 29,7% – 2 z tych kryteriów, 36,8% – 1 z tych kryteriów, a 26,7% chorych nie spełniło żadnego z tych kryteriów. Przy zastosowaniu kryterium kontroli HbA_{1c} dla populacji ogólnej odsetki chorych spełniających 3, 2 i 1 cel kontroli cukrzycy zwiększyły się do odpowiednio 11%, 34,5% i 35,5%, a odsetek chorych niespełniających żadnego z tych kryteriów zmniejszył się do 18%. Metformina w monoterapii lub w leczeniu skojarzonym była najczęściej stosowanym lekiem w badanej populacji pacjentów (80%).

WNIOSKI Większość chorych na cukrzycę typu 2 o krótkim czasie trwania nie spełniała wszystkich celów leczenia zalecanych w aktualnych wytycznych. Przy zastosowaniu celów leczenia dla populacji ogólnej (HbA_{1c} ≤7%) nieco większy, ale nadal niezadowolający odsetek chorych spełniał wszystkie kryteria kontroli cukrzycy. Metformina w monoterapii lub w leczeniu skojarzonym była najczęściej stosowanym lekiem w badanej populacji pacjentów.

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Praca wpłynęła: 18.07.2013.
Przyjęta do druku: 16.09.2013.
Publikacja online: 16.09.2013.
Zgłoszono sprzeczność interesów:
Badanie było finansowane przez
nieograniczony grant edukacyjny
od firmy TEVA Pharmaceuticals
Polska. Przedstawiciele firmy nie
brali udziału w projektowaniu
kwestionariusza, zbieraniu i analizie
danych, oraz ich interpretacji.
Pol Arch Med Wewn. 2013;
123 (11): 573-581
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Kraków 2013

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APPENDIX TABLE 1 Last hemoglobin A_{1c} measurement before the study and diabetes duration (n = 1106)

Last HbA _{1c} measurement before the study	Patients	Diabetes duration ^a
<1 week	11.4 (126)	12.6 ± 8
<1 month	12.4 (137)	12.1 ± 8
1–3 months	27.8 (308)	12.6 ± 7
4–6 months	24.9 (275)	15.4 ± 7
7–12 months	14.3 (158)	16.8 ± 6
>12 months	3.5 (39)	16.5 ± 7
unknown	5.7 (63)	14.6 ± 8

Data are presented as percentage (number) or mean ± standard deviation.

a statistically significant difference across all subgroups of last HbA_{1c} measurement ($P = 0.000$)

Abbreviations: see **TABLE 1**

APPENDIX TABLE 2 Current diabetes treatment according to hemoglobin A_{1c} levels in patients with type 2 diabetes of short duration

Exclusive drug categories, n (%)	HbA _{1c} (n = 993) ^a	
	<7.0%	>7.0%
no antidiabetic drugs	2.6 (16)	0 ^b
metformin in monotherapy	48.2 (297)	25.2 (95) ^c
metformin and SU	22.4 (138)	31.6 (119) ^c
metformin and insulin	4.9 (30)	11.4 (43) ^c
metformin and other drug (not sulfonylurea or insulin)	2.8 (17)	5.3 (20) ^b
SU in monotherapy	9.6 (59)	4.8 (18) ^c
SU and insulin	0.2 (1)	0.3 (1) ^d
SU and other drug (not metformin or insulin)	1.1 (7)	1.3 (5) ^d
insulin in monotherapy	3.9 (24)	10.6 (40) ^c
other drug or drug combinations	4.4 (27)	9.5 (36) ^c
drugs in monotherapy or combined, % (n)	<7.0%	>7.0%
metformin	81.6 (525)	83.3 (334)
SU	36.1 (231)	46.6 (183) ^b
acarbose	5.5 (35)	7.0 (27)
insulin	11.2 (71)	30.1 (118) ^c
GLP-1 agonist	0.2 (1)	1.8 (7) ^e
DPP-4 inhibitor	1.9 (12)	2.4 (9)

Data are presented as percentage (number).

a total number of valid responses

b statistically significant differences between the subgroups (X^2 test); $P = 0.001$

c $P = 0.000$

d $P = 0.007$

e $P = 0.006$

Abbreviations: see **TABLES 1** and **4**

APPENDIX TABLE 3 Current diabetes treatment according to diabetes duration in patients with type 2 diabetes of short duration (n = 1535)^a

Exclusive drug categories	<1 month (n = 40)	1–3 month (n = 207)	3–6 month (n = 180)	6–18 month (n = 620)	>18 month (n = 488)
no antidiabetic drugs ^b	15.0 (6)	3.9 (8)	2.8 (5)	1.8 (11)	1.2 (6)
metformin in monotherapy ^b	42.5 (17)	47.3 (98)	43.3 (78)	42.9 (266)	38.7 (189)
metformin and SU ^b	10.0 (4)	21.3 (44)	24.4 (44)	23.4 (145)	28.3 (138)
metformin and insulin ^b	5.0 (2)	5.3 (11)	5.6 (10)	5.0 (31)	6.8 (33)
metformin and other drug (not sulfonylurea or insulin) ^b	0	2.9 (6)	2.2 (4)	4.7 (29)	2.9 (14)
SU in monotherapy ^b	17.5 (7)	6.8 (14)	10.0 (18)	9.2 (57)	10.0 (49)
SU and insulin ^b	0	0.5 (1)	0	0.2 (1)	0.4 (2)
SU and other drug (not metformin or insulin) ^b	2.5 (1)	0.5 (1)	1.7 (3)	0.6 (4)	1.2 (6)
insulin in monotherapy ^b	5.0 (2)	8.7 (18)	6.1 (11)	5.3 (33)	5.1 (25)
other drug or drug combinations ^b	2.5 (1)	2.9 (6)	3.9 (7)	6.9 (43)	5.3 (26)
drugs in monotherapy or combined	<1 month (n = 41)	1–3 month (n = 215)	3–6 month (n = 190)	6–18 month (n = 651)	>18 month (n = 515)
metformin ^c	58.5 (24)	78.1 (168)	80.0 (152)	82.2 (535)	81.4 (419)
SU	34.1 (14)	32.2 (69)	38.3 (72)	40.2 (261)	43.9 (223)
acarbose	5.0 (2)	3.3 (7)	4.8 (9)	7.4 (47)	5.6 (28)
insulin	12.2 (5)	17.1 (36)	13.0 (24)	14.9 (95)	15.5 (78)
GLP-1 agonist	0	1.0 (2)	0.5 (1)	0.3 (2)	0.8 (4)
DPP-4 inhibitor	0	1.0 (2)	1.6 (3)	16 (10)	1.6 (8)

Data are presented as percentage (number).

a total number of valid responses

b statistically significant differences between the subgroups (χ^2 test); $P = 0.000$; $P = 0.005$

Abbreviations: see [TABLES 1](#) and [4](#)

APPENDIX TABLE 4 Meeting treatment goals in patients with type 2 diabetes of short duration: subgroup analysis by patients characteristics, % (n)

Subgroup	Number of patients in the subgroup ^a	Percentage of patients with goals met									
		3 goals met	only 2 goals met (excludes patients who met all 3 goals)		only 1 goal met (excludes patients who met more than 1 goal)			0 goals met			
		A, B, C	any 2 ^c	B and C	A and C	A and B	any ^c	B	C	A	A, B, C, all not met
BP <140/90 mmHg, LDL <100 mg/dl, or if CHD <70 mg/dl, HbA _{1c} ≤6.5%											
men (n = 372) ^b											
age, y	<40 (n = 9)	0	55.5 (5)	22.2 (2)	11.1 (1)	22.2 (2)	22.2 (2)	11.1 (1)	11.1 (1)	0	22.2 (2)
	>40 (n = 358)	5.9 (21)	27.4 (98)	6.4 (23)	3.9 (14)	17.0 (61)	36.6 (131)	17.9 (64)	6.4 (23)	12.3 (44)	30.2 (108)
BMI, kg/m ²	<25 (n = 35) ^b	11.4 (4)	34.3 (12)	17.1 (6)	5.7 (2)	11.4 (4)	34.3 (12)	17.1 (6)	5.7 (2)	11.4 (4)	20.0 (7)
	25–30 (n = 154) ^b	7.8 (12)	29.9 (46)	3.2 (5)	2.6 (4)	24.0 (37)	34.4 (53)	16.2 (25)	3.9 (6)	14.3 (22)	27.9 (43)
	>30 (n = 182) ^b	2.7 (5)	24.7 (45)	7.7 (14)	4.9 (9)	12.1 (22)	39.0 (71)	18.7 (34)	8.8 (16)	11.5 (21)	33.5 (61)
duration of diabetes, mo	≤6 (n = 78)	1.3 (1)	23.1 (18)	9.0 (7)	2.6 (2)	11.5 (9)	34.6 (27)	17.9 (14)	3.8 (3)	12.8 (10)	41.0 (32)
	6–12 (n = 68)	2.9 (2)	30.9 (21)	8.8 (6)	2.9 (2)	19.1 (13)	33.8 (23)	17.6 (12)	5.9 (4)	10.3 (7)	32.4 (22)
	>12 (n = 226)	8.0 (18)	28.3 (64)	5.3 (12)	4.9 (11)	18.1 (41)	38.0 (86)	17.7 (40)	7.5 (17)	12.8 (29)	25.7 (58)
women (n = 447) ^b											
age, y	<40 (n = 9)	0	44.4 (4)	11.1 (1)	0	33.3 (3)	11.1 (1)	0	0	11.1 (1)	44.4 (4)
	>40 (n = 436)	8.3 (36)	30.5 (133)	9.6 (42)	5.3 (23)	15.6 (68)	36.9 (161)	19.5 (85)	6.9 (30)	10.6 (46)	24.3 (106)
BMI, kg/m ²	<25 (n = 80) ^c	15.0 (12)	30.0 (24)	13.8 (11)	2.5 (2)	13.8 (11)	33.8 (27)	15.0 (12)	2.5 (2)	16.3 (13)	21.3 (17)
	25–30 (n = 156) ^c	8.3 (13)	34.0 (53)	12.8 (20)	4.5 (7)	16.7 (26)	36.5 (57)	21.2 (33)	6.4 (10)	9.0 (14)	21.2 (33)
	>30 (n = 209) ^c	5.3 (11)	28.2 (59)	5.7 (12)	6.7 (14)	15.8 (33)	37.8 (79)	19.6 (41)	8.1 (17)	10.0 (21)	28.7 (60)
duration of diabetes, mo	≤6 (n = 92) ^d	3.3 (3)	20.7 (19)	9.8 (9)	1.1 (1)	9.8 (9)	41.3 (38)	20.7 (19)	7.6 (7)	13.0 (12)	34.8 (32)
	6–12 (n = 85) ^d	7.1 (6)	29.4 (25)	10.6 (9)	7.1 (6)	11.8 (10)	37.6 (32)	21.2 (18)	1.2 (1)	15.3 (13)	25.9 (22)
	>12 (n = 270) ^d	10.0 (27)	34.4 (93)	9.3 (25)	5.9 (16)	19.3 (52)	34.8 (94)	18.1 (49)	8.1 (22)	8.5 (23)	20.7 (56)

Data are presented as percentage (number).

- ^a only the patients for whom data on all treatment goals were available
- ^b significant difference between the groups (X² test); *P* = 0.008
- ^c *P* = 0.037
- ^d *P* = 0.018

Abbreviations: see TABLES 1 and 5

APPENDIX TABLE 5 Meeting treatment goals in patients with type 2 diabetes of short duration: subgroup analysis by patients characteristics

Subgroup	Number of patients in the group ^a	Percentage of patients with goals met									
		3 goals met	only 2 goals met (excludes patients who met all 3 goals)		only 1 goal met (excludes patients who met more than 1 goal)			0 goals met			
		A, B, C	any two	B and C	A and C	A and B	any	B	C	A	A, B, C, all not met
BP <140/90, LDL <100, or if CHD<70, HbA _{1c} ≤7.0%											
men (n = 372) ^a											
age, y	<40 (n = 9) ^b	0	66.7 (6)	22.2 (2)	11.1 (1)	33.3 (3)	11.1 (1)	0	11.1 (1)	0	22.2 (2)
	>40 (n = 358) ^b	9.2 (33)	32.4 (116)	3.1 (11)	5.3 (19)	24.0 (86)	36.3 (130)	10.9 (39)	5.0 (18)	20.4 (73)	22.1 (79)
BMI, kg/m ²	<25 (n = 35) ^c	17.1 (6)	34.2 (12)	11.4 (4)	5.7 (2)	17.1 (6)	37.1 (13)	11.4 (4)	5.7 (2)	20.0 (7)	11.4 (4)
	25–30 (n = 154) ^c	9.7 (15)	37.0 (57)	1.3 (2)	3.9 (6)	31.8 (49)	28.6 (44)	8.4 (13)	2.6 (4)	24.0 (37)	18.2 (28)
	>30 (n = 182) ^c	6.6 (12)	29.1 (53)	3.8 (7)	6.6 (12)	18.7 (34)	37.9 (69)	12.1 (22)	7.1 (13)	18.7 (34)	26.4 (48)
	≤6 (n = 78)	5.1 (4)	25.6 (20)	5.1 (4)	2.6 (2)	17.9 (14)	37.1 (29)	11.5 (9)	3.8 (3)	21.8 (17)	32.1 (25)
	6–12 (n = 68)	4.4 (3)	33.8 (23)	7.4 (5)	4.4 (3)	22.1 (15)	44.1 (30)	14.7 (10)	4.4 (3)	25.0 (17)	17.6 (12)
duration of diabetes, mo	> 12 (n = 226)	11.5 (26)	35.4 (80)	1.8 (4)	6.6 (15)	27.0 (61)	33.6 (76)	8.8 (20)	5.8 (13)	19.0 (43)	19.5 (44)
women (n = 447) ^a											
age, y	<40 (n = 9)	11.1 (1)	33.3 (3)	0	0	33.3 (3)	22.2 (2)	0	0	22.2 (2)	33.3 (3)
	>40 (n = 436)	14.0 (61)	36.0 (157)	3.9 (17)	7.8 (34)	24.3 (106)	34.2 (149)	10.8 (47)	4.4 (19)	19.0 (83)	15.8 (69)
BMI, kg/m ²	<25 (n = 80) ^d	22.5 (18)	33.8 (27)	6.3 (5)	5.0 (4)	22.5 (18)	31.3 (25)	6.3 (5)	0	25.0 (20)	12.5 (10)
	25–30 (n = 156) ^d	15.4 (24)	36.5 (57)	5.8 (9)	7.1 (11)	23.7 (37)	34.0 (53)	14.1 (22)	3.8 (6)	16.0 (25)	14.1 (22)
	>30 (n = 209) ^d	9.6 (20)	35.4 (74)	1.4 (3)	8.6 (18)	25.4 (53)	35.9 (75)	10.0 (21)	6.2 (13)	19.6 (41)	19.1 (40)
duration of diabetes, mo	≤6 (n = 92)	8.7 (8)	28.3 (26)	4.3 (4)	3.3 (3)	20.7 (19)	39.1 (36)	9.8 (9)	5.4 (5)	23.9 (22)	23.9 (22)
	6–12 m (n = 85)	15.3 (13)	30.6 (26)	2.4 (2)	7.1 (6)	21.2 (18)	35.3 (30)	11.8 (10)	1.2 (1)	22.4 (19)	18.8 (16)
	> 12 (n = 270)	15.2 (41)	40.0 (108)	4.1 (11)	9.3 (25)	26.7 (72)	32.2 (87)	10.7 (29)	4.8 (13)	16.7 (45)	12.6 (34)

Data are presented as percentage (number).

a only the patients for whom data on all treatment goals were available

b significant difference between the subgroups (X² test); *P* = 0.047

c *P* = 0.007

d *P* = 0.017

Abbreviations: Abbreviations: see TABLES 1 and 5

APPENDIX TABLE 6 Meeting treatment goals in patients with type 2 diabetes of short duration: subgroup analysis by treatment type

Subgroup	Number of patients in the subgroup ^a	Percentage of patients with treatment goals met			
		3 goals met (A, B, C)	2 goals met (excludes patients who met all 3 goals)	1 goal met (excludes patients who met more than 1 goal)	0 goals met (A, B, C, all not met)
BP <140/90, LDL <100, or if CHD <70, HbA _{1c} ≤7.0%					
no antidiabetic drugs	yes (n = 15)	13.3 (2)	53.3 (8)	33.3 (5)	0
	no (n = 776)	11.7 (91)	33.8 (262)	36.1 (280)	18.4 (143)
metformin in monotherapy	yes (n = 313) ^b	16.6 (52)	41.9 (131)	31.0 (97)	10.5 (33)
	no (n = 463) ^b	8.4 (39)	28.3 (131)	39.5 (183)	23.8 (110)
	no drugs (n = 15) ^b	13.3 (2)	53.3 (8)	33.3 (5)	0
metformin and SU	yes (n = 201) ^c	6.5 (13)	27.9 (56)	42.3 (85)	23.4 (47)
	no (n = 575) ^c	13.6 (78)	35.8 (206)	33.9 (195)	16.7 (96)
	no drugs (n = 15) ^c	13.3 (2)	53.3 (8)	33.3 (5)	0
metformin and insulin	yes (n = 59)	6.8 (4)	27.1 (16)	42.4 (25)	23.7 (14)
	no (n = 717)	12.1 (87)	34.3 (246)	35.6 (255)	18.0 (129)
	no drugs (n = 15)	13.3 (2)	53.3 (8)	33.3 (5)	0
metformin and a drug other than SU and insulin	yes (n = 25)	8.0 (2)	24.0 (6)	44.0 (11)	24.0 (6)
	no (n = 751)	11.9 (89)	34.1 (256)	35.8 (269)	18.2 (137)
	no drugs (n = 15)	13.3 (2)	53.3 (8)	33.3 (5)	0
insulin in monotherapy	yes (n = 50)	6.0 (3)	34.0 (17)	32.0 (16)	28.0 (14)
	no (n = 726)	12.1 (88)	33.7 (245)	36.4 (264)	17.8 (129)
	no drugs (n = 15)	13.3 (2)	53.3 (8)	33.3 (5)	0
insulin and other drug	yes (n = 91) ^d	5.5 (5)	26.4 (24)	38.5 (35)	29.7 (27)
	no (n = 685) ^d	12.6 (86)	34.7 (238)	35.8 (245)	16.9 (116)
	no drugs (n = 15) ^d	13.3 (2)	53.3 (8)	33.3 (5)	0

Data are presented as percentage (number).

a only the patients for whom data on all treatment goals were available

b significant difference between the groups (χ^2 test); $P = 0.000$

c $P = 0.003$

d $P = 0.01$

Abbreviations: Abbreviations: see [TABLES 1, 4, and 5](#)

APPENDIX TABLE 7 Meeting treatment goals in patients with type 2 diabetes of short duration: subgroup analysis by hemoglobin A_{1c} and diabetes duration

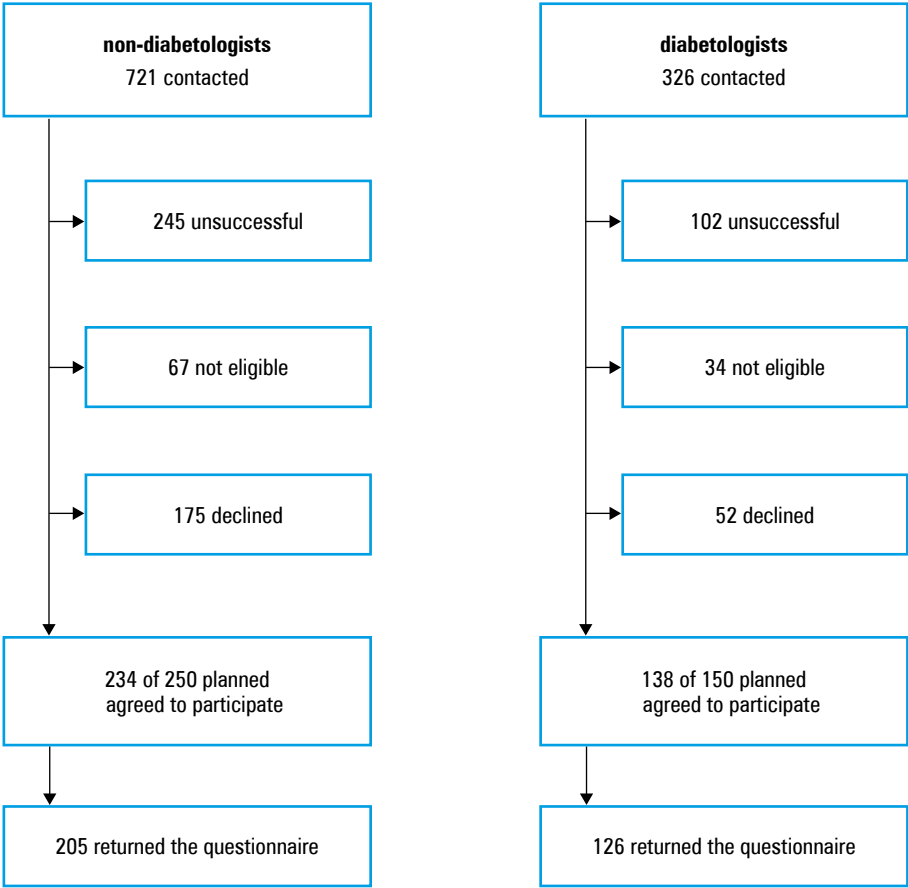
Subgroup		Number of patients in subgroup ^a	Percentage of patients with goals met			
			3 goals met	only 2 goals met (excludes patients who met all 3 goals)	only 1 goal met (excludes patients who met more than 1 goal)	0 goals met (A, B, C, all not met)
BP <140/90 mmHg, LDL <100 mg/dl, or if CHD <70 mg/dl, HbA _{1c} ≤7.0%						
HbA _{1c}	≤7%	530	18.3 (97)	49.8 (264)	31.9 (169)	0
	>7%	315	0	9.5 (30)	41.6 (131)	48.9 (154)
	≤6.5%	335	17.0 (57)	54.0 (181)	29.0 (97)	0
	>6.5%	510	7.8 (40)	22.2 (113)	39.8 (203)	30.2 (154)
diabetes	≤1 year	333 ^b	8.7 (29)	29.4 (98)	39.0 (130)	22.8 (76)
	>1 year	511 ^b	13.3 (68)	38.4 (196)	33.1 (169)	15.3 (78)
BP <140/90 mmHg, LDL <100 mg/dl, or if CHD <70 mg/dl, HbA _{1c} ≤6.5%						
HbA _{1c}	≤7%	530	10.8 (57)	41.7 (221)	34.0 (180)	13.6 (72)
	>7%	315	0	9.5 (30)	41.6 (131)	48.9 (154)
	≤6.5%	335	17.0 (57)	54.0 (181)	29.0 (97)	0
	>6.5%	510	0	13.7 (70)	42.0 (214)	44.3 (226)
diabetes	≤1 year	333 ^c	3.6 (12)	26.1 (87)	37.2 (124)	33.0 (110)
	>1 year	511 ^c	8.8 (45)	32.1 (164)	36.4 (186)	22.7 (116)

Data are presented as percentage (number).

- a** only the patients for whom data on all treatment goals were available
b significant difference between the groups (X² test); *P* = 0.001;
c *P* = 0.000

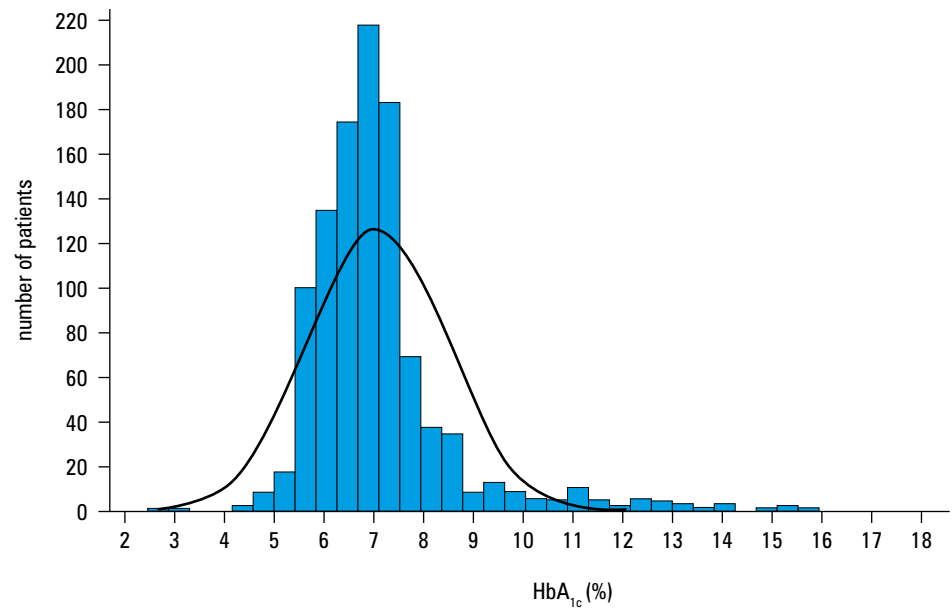
Abbreviations: see TABLES 1 and 5

APPENDIX
FIGURE 1 Study flow of physicians participating in the ARETAEUS2-Grupa study



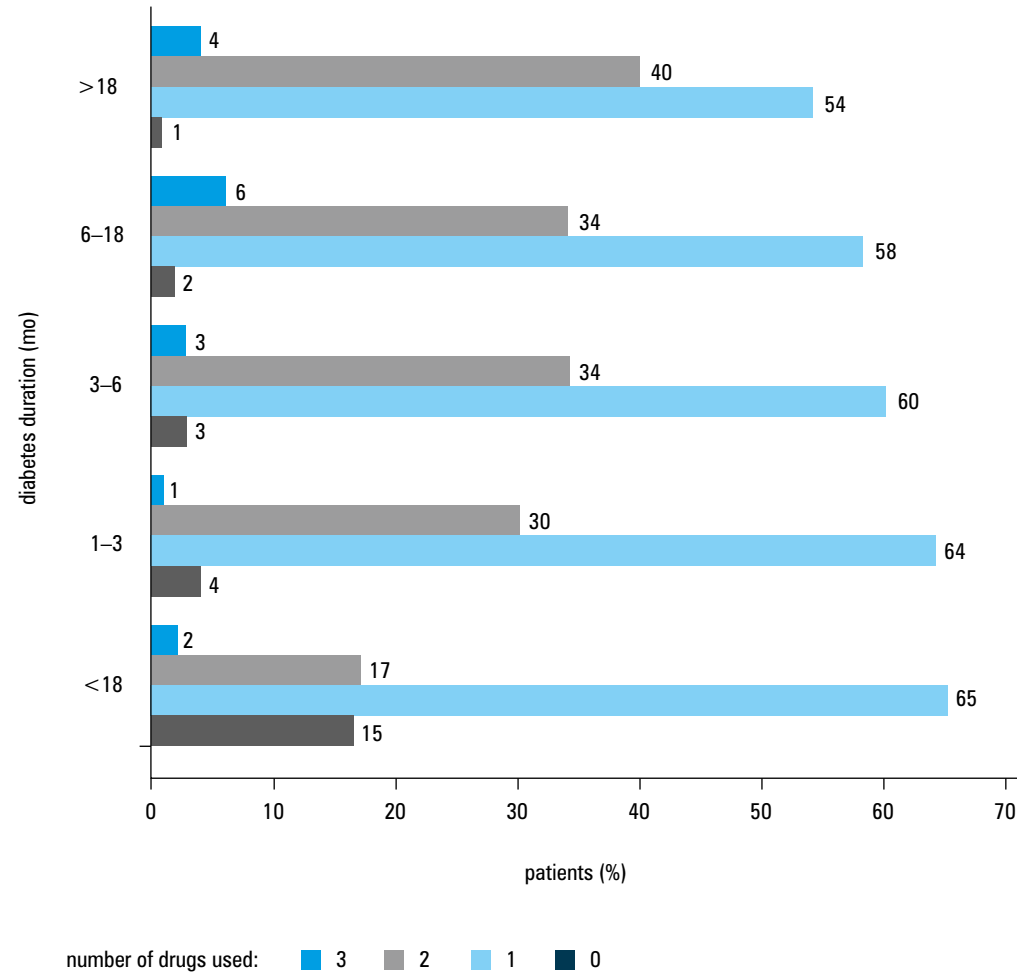
APPENDIX

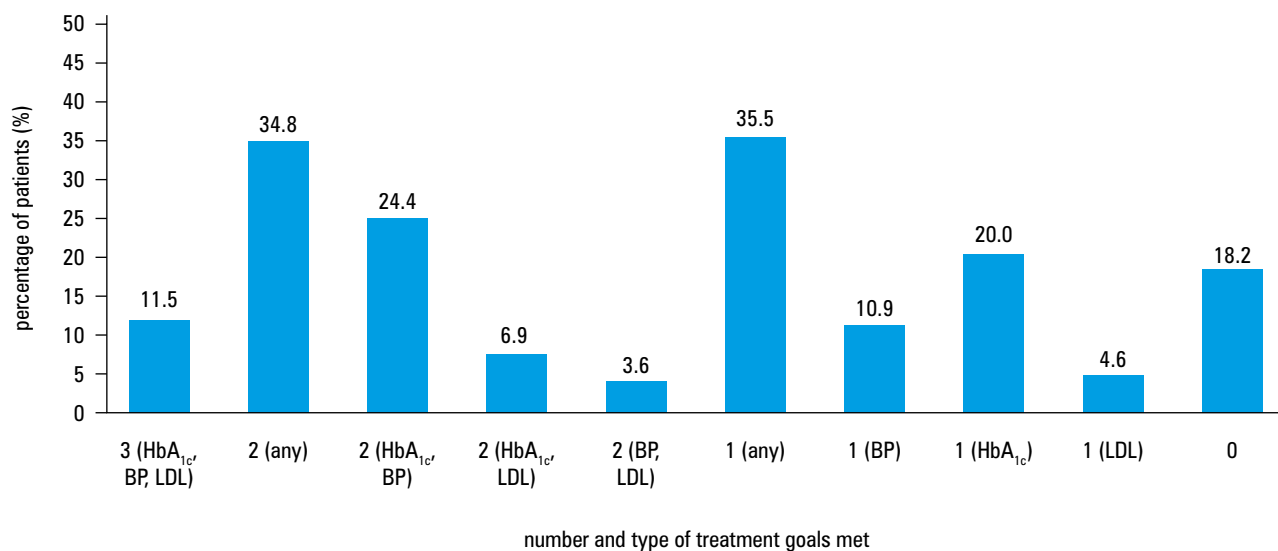
FIGURE 2 Distribution of hemoglobin A_{1c} (HbA_{1c}) values in patients with type 2 diabetes of short duration



APPENDIX

FIGURE 3 Number of antidiabetic drugs used by patients with type 2 diabetes of short duration





APPENDIX FIGURE 4 Proportions of patients with type 2 diabetes of short duration meeting treatment goals recommended for overall population by 2012 Diabetes Poland guidelines (HbA_{1c} ≤ 7%)
Abbreviations: see [TABLE 1](#)