L: Cost and consequences of ADA treatment targets (Abstract). *Diabetes* 46 (Suppl. 1):35A, 1997

Different Effects of Acarbose and Voglibose on Serum 1,5-Anhydroglucitol Concentrations

Serum 1,5-anhydroglucitol (1,5-AG) concentrations are widely used as clinical markers of glycemic control in NIDDM patients (1). Recently, Yoshioka et al. (2) reported that serum 1,5-AG concentrations improve rapidly after administration of the α-glucosidase inhibitor voglibose and concluded that 1,5-AG is superior to HbA_{1c} for evaluating current glycemic status. We evaluated the clinical usefulness of 1,5-AG using another α-glucosidase inhibitor, acarbose, which is currently being prescribed for NIDDM patients with postprandial hyperglycemia (3).

Thirty-one patients with NIDDM (20 men and 11 women; mean age 66 ± 9 years; BMI 22.4 ± 3.3 kg/m^2) who were receiving diet therapy of 25–30 kcal/kg ideal body wt were studied. Subjects were divided into the acarbose (300 mg) or voglibose (0.6 mg) group and received the respective drugs three times a day before each meal because of postprandial hyperglycemia.

After 2 weeks of treatment, 1,5-AG concentrations in the voglibose group rapidly improved, consistent with the previous study (2), while those in the acarbose group did not improve (Table 1). After 4 weeks, in both groups, the fasting plasma glucose and HbA_{1c} concentrations were significantly improved, but contrary to our expectations, 1,5-AG concentrations in the acarbose group were slightly decreased.

The mechanism of paradoxical decrease in 1,5-AG concentrations after treatment with acarbose is unclear. However, because acarbose, being different from voglibose, inhibits not only maltase, α-dextrinase, and sucrase but also α-amylase (4), this agent may inhibit the absorption of foods (vegetables, fruits, grains, meat, and milk) containing 1,5-AG, which may have resulted in the observed discrepancy between 1,5-AG and HbA_{1c}. Furthermore, metabolites of acarbose (5) might inhibit reabsorption of 1,5-AG in renal tubules. Further examinations are needed to clarify these points.

Table 1—*Effects of acarbose and voglibose on fasting blood glucose, HbA_{1c}, and 1,5-AG levels*

	Acarbose	*P* value	Voglibose	*P* value
n (M/F)	16 (10/6)	—	15 (10/5)	—
Fasting blood glucose (mmol/l)				
Before treatment	8.9 ± 1.8	—	8.7 ± 2.1	—
2 weeks	8.3 ± 1.0	0.134	8.2 ± 1.4	0.148
4 weeks	7.8 ± 0.8	0.003	7.8 ± 1.4	0.041
HbA_{1c} (%)				
Before treatment	7.5 ± 0.8	—	7.3 ± 0.6	—
2 weeks	7.5 ± 0.8	0.480	7.3 ± 0.7	0.110
4 weeks	7.2 ± 0.9	0.001	7.1 ± 0.6	0.002
1,5-AG (μg/ml)				
Before treatment	5.4 ± 3.4	—	5.5 ± 2 6	—
2 weeks	5.0 ± 3.0	0.115	7 2 ± 2.9	0.001
4 weeks	4.8 ± 3.3	0.179	9.6 ± 3.1	0.001

Data are means ± SD. Wilcoxon's test was performed. *P* values are versus before treatment.

NAOKI SAKANE, MD
TOSHIHIDE YOSHIDA, MD
AKINORI KOGURE, MD
MOTOHARU KONDO, MD

From the Department of Medicine and Endocrine Unit, Ayabe Municipal Hospital (N.S.); and the First Department of Internal Medicine, Kyoto Prefectural University of Medicine (T.Y., A.K., M.K.), Kyoto, Japan.

Address correspondence to Toshihide Yoshida, MD, PhD, First Department of Internal Medicine, Kyoto Prefectural University of Medicine, 465-Kajiicho, Hirokoji-Kawaramachi, Kamikyo-ku, Kyoto 602, Japan.

References

1. Yamanouchi T, Minoda S, Yabuuchi M, Akanuma Y, Akanuma H, Miyashita H, Akoaka I: Plasma 1,5-anhydro-D-glucitol as new clinical marker of glycemic control in NIDDM patients. *Diabetes* 38:723–729, 1989
2. Yoshioka K, Azukari K, Yoshida T, Kondo M: Rapid improvement of serum 1,5-anhydroglucitol concentrations after administration of α-glucosidase inhibitor (Letter). *Diabetes Care* 20:462, 1997
3. Coniff RF, Shapiro JA, Seaton TB, Hoogwerf BJ, Hunt JA: A double-blind placebo-controlled trial evaluating the safety and efficacy of acarbose for the treatment of patients with insulin-requiring type II diabetes. *Diabetes Care* 18:928–932, 1995
4. Shinozaki K, Suzuki M, Ikebuchi M, Hirose J, Hara Y, Harano Y: Improvement of insulin sensitivity and dyslipidemia with a new α-glucosidase inhibitor, voglibose, in nondiabetic hyperinsulinemic subjects. *Metabolism* 45:731–737, 1996
5. Ahr HJ, Boberg M, Krause HP, Maul W, Müller FO, Ploschke HJ, Weber H, Wünsche C: Pharmacokinetics of acarbose: absorption, concentration in plasma, metabolism and excretion after single administration of ^{14}C-acarbose to rats, dogs and men. *Drug Res* 39:1254–1260, 1989
6. Kishimoto M, Yamasaki Y, Kubota M, Araki K, Morishima T, Kawamori R, Kamada T: 1,5-anhydro-D-glucitol evaluates daily glycemic excursions in well-controlled NIDDM. *Diabetes Care* 18:1156–1159, 1995

Response to Sakane et al.

Serum 1,5-anhydroglucitol (1,5-AG) concentration is a new clinical marker of short-term glycemic control in diabetes (1). Sakane et al. (2) have reported the different effects of acarbose and voglibose on serum 1,5-AG concentrations. We agree with their results, which are consistent with our previous study (3), showing that the serum 1,5-AG concentrations rapidly improved in the voglibose group while those in the acarbose group did not improve even when HbA_{1c} level was corrected 4 weeks after administration of acarbose. The results presented by Sakane et al. are consistent with the recent report by Hotta et al. (4). They showed that serum 1,5-AG concentrations did not change significantly during 1-week acarbose therapy, when serum fructosamine levels and 24-h urinary glucose excretion decreased significantly compared with that before administration of acarbose, but increased markedly 1 week after discontin-

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