

Adherence to Hypoglycemic Medication among Insulin-Treated Patients with Type 2 Diabetes

Dear Editor

Type-2 diabetes is a progressive metabolic disease requiring ongoing medical care. Despite different therapeutic regimens for diabetes, only a few patients achieve the glycemic target,¹ which might be the result of poor medication adherence and other aspects of self-management. Medication adherence is described as the extent to which patients take medication according to the prescribed dosage.² To the best of our knowledge, medication adherence, particularly insulin, in diabetes patients, has been poorly investigated in developing countries such as Iran. Furthermore, barriers to compliance with each medicine were not exactly determined by previous studies. Thus, the current study was designed to evaluate the level of adherence to hypoglycemic medication among insulin-treated patients with type-2 diabetes. In addition, parameters associated with adherence were assessed.

A total of 150 insulin-treated type-2 diabetes patients at a mean age of 55.66 ± 8.85 years were enrolled in this study. Self-reported medication adherence on the preceding day and over the preceding week as well as related barriers was assessed. The association between the adherence rate and the patients' characteristics was assessed using the Mann–Whitney and Kruskal–Wallis tests. The Spearman correlation coefficient was used to measure the association between the adherence rate and the ranked variables. The analyses were conducted using SPSS, version 11.5, at a significance level of less than 5%. This study was funded and supported by Mashhad University of Medical Sciences. The study was approved by the Ethics Committee of Mashhad University of Medical Sciences. Informed consent was obtained from all the patients.

The adherence rate to all oral hypoglycemic agents (OHAs) over the preceding week was $81.04 \pm 32.09\%$, and the patients had taken $78.85 \pm 37.62\%$ of the prescribed OHAs on the preceding day. There was a significant correlation between medication adherence over the preceding week and on the preceding day (the Spearman correlation coefficient, $r=0.807$, $P<0.001$). The greatest compliance was observed with alpha-glucosidase inhibitors (100%) and meglitinides (100%); nonetheless, only 5 participants used these drugs. If these drugs were excluded, the greatest level of adherence would belong to metformin ($87.01 \pm 27.23\%$).

The most common self-reported obstacle for adherence was “forgetting”, followed by “unavailability of medicine” at home and “patients' beliefs” as regards medication. Some patients who were taking thiazolidinedione believed that this drug failed to improve their glycemic levels; moreover, side effects in this class were more than those by other OHAs.

Neutral Protamine Hagedorn (NPH) was the most common prescribed insulin, with more than half of the patients using it. Lantus was the most frequent pen insulin. The patients reported very high levels of adherence in this case. The compliance rate for insulin over the preceding week was $92.47 \pm 18.99\%$, and the patients took $93.68 \pm 19.37\%$ of the prescribed insulin on the preceding day. There was a significant correlation between the adherence level over the preceding week and on the preceding day (the Spearman correlation coefficient, $r=0.574$, $P<0.001$). With respect to insulin classes, the compliance level was highest among the patients receiving Lantus insulin ($95.58 \pm 18.54\%$) and was lowest among those receiving NovoRapid insulin ($85.71 \pm 24.39\%$).

“Forgetting” was the 1st reason for non-adherence in all types of insulin, while “dependence on another person” for injection among the NPH insulin users, “cost” among the pen insulin users, “adverse side effects” among the regular insulin users, and “patients' beliefs” as regards the ineffectiveness of insulin among 70/30 users were reported as the other obstacles.

Evaluating the effects of the patients' characteristics on the level of adherence indicated that the married participants had a significantly higher rate of adherence to insulin ($P<0.001$). There was an inverse correlation between age and insulin adherence on the preceding day (the Spearman correlation coefficient $r=-0.208$, $P=0.011$). Other demographic factors such as gender, education, income, total number of OHAs or dose of insulin, and duration of diabetes treatment did not affect the adherence level significantly.

An assessment of the correlation between self-reported adherence and metabolic control indicated an inverse relation between the A_{1C} level and medication adherence over the preceding week (the Spearman correlation coefficient, $r=-0.15$, $P=0.05$).

Our findings showed acceptable compliance with treatment among type-2 diabetes patients treated with insulin, including both insulin and OHAs. Nonetheless, adherence to prescribed insulin was more

than adherence to OHAs. The identified barrier to adherence to each medication should be taken into account to optimize diabetes management and clinical effectiveness.

Acknowledgment

We thank Mashhad University of Medical Sciences for financial support.

Conflict of Interest: None declared.

Please cite this article as: Zarei-Shargh P, Mehdizadeh-Hakkak A, Bagherniya M, Jarahi L, Mousavi Z, Safarian M. Adherence to Hypoglycemic Medication among Insulin-Treated Patients with Type 2 Diabetes. *Iran J Med Sci.* 2017;42(4):420-421.

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Received: 14 November 2016

Revised: 31 December 2016

Accepted: 29 January 2017

References

1. Garcia-Perez LE, Alvarez M, Dilla T, Gil-Guillen V, Orozco-Beltran D. Adherence to therapies in patients with type 2 diabetes. *Diabetes Ther.* 2013;4:175-94. doi: 10.1007/s13300-013-0034-y. PubMed PMID: 23990497; PubMed Central PMCID: PMC3889324.
2. Osterberg L, Blaschke T. Adherence to medication. *N Engl J Med.* 2005;353:487-97. doi: 10.1056/NEJMra050100. PubMed PMID: 16079372.