

Research Paper

Evaluation of the Status of the Care Provided in the Diabetes Treatment Centers of Ahvaz in 2015

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ABSTRACT

Background & aim: Diabetes is the most common metabolic disease in the world that in the absence of appropriate controls it could result in significant morbidity and mortality. Appropriate blood sugar controlling measures could reduce or delay the onset and progression of diabetes complications. Considering the importance of providing cares for diabetic patients that has been implied by the American Diabetes Association, this study was conducted to check the status of the diabetes cares provided in the Ahvaz diabetes clinics.

Methods: This cross-sectional study was conducted by convenient sampling method on 296 diabetic patients referred to the diabetes clinics in the Ahvaz. Data was collected from patients through questionnaires, medical records and blood A1C hemoglobin measurement through a blood test. Data was analyzed using SPSS software (version 21) with a significance level of less than 0.05 and descriptive statistics, Paired t-test and chi-square.

Results: The results showed that the majority of patients (70.9%) were women in the age range of 80-56 years (76.8%). A large

percentage (79%) of patient has high blood pressure but only 45.3% of them were taking ASA. The 83.8% of people has high blood fat, and most of them (66.8%) had non-standard hemoglobin A1C. The annual examination of the heart (ECG) and eye exams was done in 70.9% and 82.4% of patients respectively. But a small percentage of patients, 18.2% and 29% respectively, underwent neurological examination and foot examination. Kidney tests and measurement of blood fat and blood were done in 82.4%, 98.6% and 89.9% of patients, respectively.

Conclusion: Despite the desirability of the care provided in most cases and their compliance with the international standards of American Diabetes Association, we see lacks of proper control of blood glucose in these patients. As a result, the evaluation of the quality of cares provided at the national level, introducing appropriate solutions, as well as relying on the necessity of patient and health workers adherence with the medical cares are suggested to improvement of the health status of individuals.

Keywords: Diabetes; Care; Health centers

Introduction

Diabetes mellitus is a chronic metabolic disease characterized by high blood sugar levels caused by impaired insulin secretion, insulin effects or both. This is one of the most common health problems in all countries, so that the World Health Organization cites this as a silent epidemic [1]. According to the World Health Organization forecast it is expected that the population of diabetic patients will increase from 161 million patients in 2005 to 366 million in 2030 [2]. The World Health Organization estimates that the number of diabetic patients in Iran in 2030 will reach to more than six million [3].

This increasing prevalence of diabetes has a significant impact on the health care costs. Such that the caring cost for diabetic patients in most systems in the world is 2 to 4 times more than the cost of non-diabetic people [4]. The American Diabetes Association knows the largest cause of death in diabetic patients from complications of the disease, and emphasize on the care of diabetic patients as the prevention and treatment of complications in diabetic patients helps to improving their lives [5]. American Diabetes Association sets special guidelines to care for diabetic patients which are revised every year. This guidance is based on the control of blood sugar and lipids,

neuropathy, retinopathy, blood pressure control, foot care, dietary advices, self-assessment and other items [6].

Several studies conducted in different countries to assess the diabetes control and management and all evidence shows that the management of diabetes in different populations even in the developed countries is not desirable. In general, the quality of care in the world, regardless of the status of their health systems, is not at a desirable level [7,8]. For example, studies in America have been shown that the current care situation is far from the standards of Diabetes Association [9]. On the other hand the National Audit Association (NAD) in Great Britain reports the poor state of care for diabetic patients [10]. The studies conducted in Iran also suggest that there is a huge gap in the quality of diabetes care and standards. Alamdari study showed that only 10% of patients were at an optimum level for LDL, FBS, BS 24hpp and cholesterol and HbA1C that it is a big difference is the quality of diabetes control with the recommendations of the American Diabetes Association (ADA) [11]. Azizi also showed that the quality of diabetes care and glycemic control in the study area was close to the national level but there was a relatively large distance from the proposed standards, especially from the American Diabetes Association guidelines [12]. The

study of Tabatabai et al on the 230 elderly patients with type 2 Diabetes in the Shariati Hospital diabetic clinic showed that the Diabetic seniors care situation in the country is not in good condition. And although more than two-thirds of patients was under treatment for diabetes, hypertension, and dyslipidemia, the control status of hemoglobin A1C in over half of patients was not desirable [13].

Narayan says that the health care systems play a central role in response to the growing problem of diabetes [14]. Launch of diabetes mellitus units in hospitals and clinics is the main theme for optimal control of diabetes in diabetic population. Nurses working in the diabetes centers have a major role in implementation of the national program for prevention and control of diabetes [15]. So evaluation of the performance of these units provides an indicator of the status of the care provided for diabetic patients. Due to this and also because the few studies conducted in this field in Iran and the needs for a comprehensive and coherent review of the situation, this study was designed to evaluate the status of diabetic's care provided in hospitals.

Methodology

This study was a cross-sectional study included all diabetic patients in diabetes clinics of Ahvaz in 2015. In this study 296 patients (using sample size formula) was selected using convenient sampling method to the criteria for inclusion in the range of 18 to 80 years of age with a confirmed diagnosis of diabetes by the treating physician and referring to diabetic clinic at least for one year, without a history of depression and etc. The patient care questionnaire was the collection tool in this study. This questionnaire was designed by the Diabetes Research Center of Jundishapur University of Ahvaz to obtain information about the care status of diabetic patients and determination of the care provided to patients, which was included 120 items and divides into 6 sections. The first part includes demographic information; and the second part has information on the course of the disease. The third part was about the screening for complications, the fourth section was related to the control of complications, the fifth part was about the lifestyle of patients, and the last part was in relation to education in diabetic patients. This was in compliance with the standards of the International Association of Diabetes in America in 2015. The face validity method was used to determine the validity of this approach. The reliability was confirmed by split-half method and Cronbach's alpha coefficient ($r=0/72$) and then were filled through interviews with patients. 1.5 ml of blood samples were collected for the control of glycosylated hemoglobin from every diabetic patient. Blood samples were transferred to test tubes containing anticoagulant and were sent within 2 h to the laboratory of Jundishapur University Diabetes Research Center. The glycosylated hemoglobin was measured using Naycocard kit. Cholesterol, triglycerides, cholesterol and fasting blood sugar were filled through the family medical records of patients who had been tested in the last 6 months. The complications of diabetes were recorded in the questionnaire with the approval of physician. The ethical considerations (IR.AJMS.

REC.31.1394) were observed in this study. The SPSS statistical software (version 21) was used for data analysis. The data was described by frequency table and standard deviation and the paired t-test and the chi-square were used for data analysis. Statistical significance was taken at $p=0.05$.

Findings

In this study, 296 patients were studied of which 70.9% was female in the age group of 56-80 years (76.8%). Patients with type 2 diabetes had the highest frequency (94%) (Table 1). According to Table 1 information on the body mass index (BMI) of participants was classified into three categories. The majority of participants in this study were in the overweight range ($BMI \geq 27$).

According to this study the majority of patients were from Fars ethnic group (54.4) and most of them had diploma or higher education (31.7). The 19.5% of the participants had a history of hospitalization in the previous year, and most patients had history of using oral hypoglycemic drugs (80.4%).

Table 2 is based on the characteristics and risk factors associated with the disease showed that most people have a family history of diabetes (66.9%). Only 11% were smokers and 25% had received annual influenza vaccination. On the other hand, a large percentage had high blood pressure (79%) but only 45.3% of them used ASA. the 83.8% of people had hyperlipidemia, and most patients was with non-standard hemoglobin A1C (66.8%).

According to the Table 3 which showed the results related with tracking complications, most cases had annual examination of

Table 1: Frequency and percentage of demographic profile.

Demographic profile		Frequency	Percentage
Sex	Female	210	70.9
	Male	86	29.1
Age	18-35	18	6
	36-55	122	41.2
	56-80	156	52.7
	$\geq 24/9$	52	17.5
BMI	25-29.9	44	14.8
	≤ 30	200	67.5
Type of diabetes	Type 1 diabetes	18	6
	Type 2 diabetes	278	94

Table 2: Frequency and percentage of risk factors.

Risk factors	Frequency	Percentage
Family history	198	66.9
Annual flu vaccination	74	25
Taking ASA	134	45.3
high blood pressure	158	53.7
Hyperlipidemia	248	83.8
Standard hemoglobin A1C	98	33.1
Cigarette smoking	22	7.4

Table 3: Information related to complications tracking in the last year.

Complications	Frequency	Percentage
Heart examinations (ECG)	110	70.9
Eye exams	244	82.4
The neurological examination	54	18.2
Kidney examination	122	82.4
Foot examinations	86	29
Lipid tests	292	98.6
Blood pressure measurement	264	89.9

the heart (ECG) and eye exams (70.9% and 82.4%, respectively) among them, 41 patients had retinopathy and 43 patients had cardiovascular problems. According to this study a small percentage of patients, respectively 18.2% and 29%, underwent neurological examination and foot examination. Kidney examinations were performed on the 82.4% of patients. Of them, 14 cases were complicated by microalbuminuria. Blood fat and blood pressure were measured in 98.6% and 89.9% of patients respectively. Ultimately, there was not any association between the care provided and complications tracking. (Tables 1-3).

Discussion

The American Diabetes Association has specific instructions for clinicians, patients, researchers and public for the diabetic patients care which set treatment's goals and tools for assessing the quality of the patient care. These guidelines are revised each year [16]. These guidelines include screening, diagnostic and therapeutic measures known to have a positive effect on the health of diabetic patients and also are economically cost effective for patients [17].

Our study showed that 66.8% of patients had non-standard hemoglobin A1C. The non-standard hemoglobin A1C level in Alamdari [11], Gol [18], Soleimani [19], Azizi [12] and Smith's [20] studies was 54%, 55%, 77.7%, 76%, 57.4%, respectively which are almost Consistent with our results.

In this study, 18.2% of individuals had neurological examination as recommended by the ADA at least once per year. This rate was only 5% in Alamdari study [11] which shows that the status of our study is slightly better. The 82.4% of patients had annual eye examinations accordant to the American Diabetes Association guidelines. The rate of eye exams in Alamdari [11], Alibaid [21], Farzan [22], Soleimani [19] and Azizi [12] studies was 20%, 87%, 30.5%, 31.9% and 30%, respectively. The ADA recommends that eye examination (fundoscopy) should be done within a short time after the diagnosis of diabetes, and then it must be repeated every year. Our study region was in better situation in terms of the ADA criteria.

In this study, foot examinations were done in a small percentage of people (29%) at least once per year accordant to the ADA recommendation. The rate of foot examinations in Alamdari [11], Farzana [22] and Alubaid [21] studies were 9%, 30.53% and 97%, respectively, that there is a huge difference between our results comparing with the American Diabetes Association.

On the other hand, the examination of the kidney (microalbuminuria) was done in the majority of patients (82.4%) and at least once per year accordant to the Diabetes Association standards. This was reported in the studies of Alamdari [11], Alubaid [21] and Farzana [22] 6%, 58% and 24.8%, respectively. On the other hand, according to the American Diabetes Association recommendations, the nephropathy and microalbuminuria screening must be done 5 years after diagnosis for patients with type 1 diabetes and at the diagnosis for the type 2 diabetes. Our results in comparison with the Association standards were relatively in good situation.

The blood lipids tests were done in most subjects (98.6%) at least 2 times per year accordant to the American Diabetes Association standards. This was 82%, 46.16%, 75%, 36.5%, and 58.1% in the Alamdari [11], Alubaid [21], Farzana [22], Soleimani [19] and Azizi [12] studies, respectively. In comparison, our region was in better conditions.

Ultimately, blood pressure measurement was done in the majority of patients (89.9%) routinely at each visit in accordance with the recommendations of the Association. In the studies of Alamdari [11], Alubaid [21] and Farzana [22] this was measured 100%, 100% and 85.8%, respectively. In our study almost all patients [98.6%] visits the health care centers at least 3 times per year.

In the Azizi study, the family physician's surveillance on patients was two times in a year on average; the 86% of patients was under medical care at least once during the last year and their blood pressure was measured by a physician [12]. While in the Soleimani study, 63.9% of patients were under physician surveillance at least once in a year [19]. Wang study showed that 84% of patients had medical care at least twice per year [23]. Given these results, our study was in a fairly desirable situation. Favorable items in our study may be due to the better public knowledge, the efforts of the media to inform people, the Patient follow-up and referral to medical centers.

Conclusion

Despite the some relatively desirable cares and their proximity to the international standards of American Diabetes Association we notice the failure of controlling of disease in patients, so that the blood sugar was not at the optimal level of Association in most patients. This indicates the poor quality of cares and loss to follow-up care by patients, especially nurses or physicians. This is observed in many other studies in the world and Iran.

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REFERENCES

1. Khorasani P, Eskandari M (2010) Universal Epidemiologic in Health Science, 1st Ed, Tehran; Jamenagar, Salemi, (Persian)
2. Caughey GE, Roughead EE, Vitry AI, McDermott RA, Shakib S, Gilbert AL (2010) Comorbidity in the elderly with diabetes: Identification of areas of potential treatment conflicts. *Diabetes research and clinical practice.*; 87: 385-393
3. Hemmati maslak pak M, Prizad N, Khalkhali H (2012) [Effects of distance learning by telephone and short message service on glycemic control in patients with type II diabetes]. *Journal of Nursing and Midwifery Urmia University of Medical Sciences*; 10: 39 (Persian).
4. Centers for Disease Control and Prevention. National diabetes fact sheet: National estimates and general information on diabetes and prediabetes in the United States, Atlanta, GA: U. S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2011: 1-12.
5. American Diabetes Association. Standards, of medical care for patients with diabetes mellitus *Diabetes care* 2010; 26 suppl: S33-S50
6. American Diabetes Association (2012) Medical Management of Type 1 Diabetes. Alexandria, VA, American Diabetes Association.
7. Saaddine JB, Cadwell B, Gregg EW, Engelgau MM, Vinicor F, Imperatore G, Narayan KM (2002) : Improvements in Diabetes processes of care and intermediate outcomes: United States, 1988-2002. *Ann Intern Med*; 144: 456-474.
8. Liebl A, Mata M, Esch wage E (2002) Evaluation of factors for development of complications in type II diabetes in Europe. *Diabetologia*; 45: S23-S28.
9. Grant WR, Buse BJ, Meigs B (2005) Quality of diabetes care in U.S Academic Medical centers *diabetes Care*; 28: 337-342.
10. Diabetes care in England and Wales: information from the 2010–2011 National Diabetes Audit. *Diabetic Medicine*; 30:799-802.DOI:10.1111/dme.12182
11. Iranparvar Alamdari M, HosainGhorbani B (2012) Diabetes care in diabetic patients referred to the clinic of Ardabil. *Journal of Ardabil University of Medical Sciences*; 12: 239-247
12. Delpisheh A, Azizi H (2014) Quality of care and glycemic control in patients with type II diabetes in rural areas under Family medical coverage. *Journal of Diabetes and etabolism*; 14:189-198
13. Tabatabaei A, Treaty M, Heshmat R, Pajouhi M (2010) Diabetes care in elderly patients referred to the Shariati Hospital diabetes clinic. *Iran J DiabLipid Disord*;10: 161-169
14. Impact of recent increase in incidence on41 .Narayan Km, Boyle Jp. *Future Diabetes Burden: US, 2005–2050. Diabetes Care* 2006; 29: 2114-2116
15. Delavary A, Mahdavizadeh A (1383) Nurse and diabetes Diabetes Prevention and Control Program. [In order] Ministry of Health, Health and Medical Education, Department of Health, Center for Disease Control, Department of Endocrinology and. Metabolic. Tehran, the capital of Sound Publishing; 1383: 84.ISBN: 964-359-150
16. Suwatter P, Lynch JC, Pendergrass ML (2009) Quality of care for diabetes patient in a large urban public hospital. *Diabetes care* 263: 563- 568
17. The DOTA workshop on quality of diabetes care, Pan American Health Organization onchio Aios, Jamaica 11-12 March; 2002
18. Col A.S. Menon a, Surg Capt A.I. Ahluwalia (2015) The ABC of diabetes. How many patients are able to achieve the goal laid down by American Diabetes Association? *Medical journal armed for ces india*; 71: 132 -134. <http://dx.doi.org/10.1016/j.mjafi.2014.10.008>
19. Montazam H, Soleymani A (2011) Quality of care for patients with type 2 diabetes in rural areas, city MALEKAN. *Journal of North Khorasan University of Medical Sciences*; 3: 75-82
20. Heydari. S, Shirazi.F, Sanjari.M, Selimi.S, r Baljany.E, Tizfahm.T (1389) Factors influencing glycemic control in type 2 diabetic patients referred to the Endocrine Institute affiliated to Iran University of Medical Sciences, Iran *J Diab Lipid Disord*;9: 365-375
21. Al-Ubaidi B A, Al-Khadraji M A(2014) Measuring adherence rate to quality indicators for diabetes care identified by primary health care in Bahrain. *Saudi Med J*; 35: 975-980
22. Farzana M, Nimra F (2013) Adherence of Healthcare Professionals to American Diabetes Association 2004 guidelines for the care of patients with type 2 diabetes at Peripheral Diabetes Clinics in Karachi, Pakistan. *Pakistan Journal Medical Sciences*; 29: 474-478. PMID: PMC3809251
23. Wang J, Thomas J, Byrd D, Nola K, Liu J (2010) Status of diabetes care among community pharmacy patients with diabetes: analysis of the Medical Expenditure Panel Survey, *J Am Pharm Assoc* 2003; 50:478-84.DOI: 10.1331/JAPhA.2010.08173

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