ejpmr, 2021,8(2), 164-167

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

EVALUATION OF THE ADMINISTRATION AND SELF-MONITORING OF INSULIN THERAPY AMONG MOROCCAN DIABETIC PATIENTS

Hicham Fettah*[2], Mohammed Reda Sefrioui[1], Chaima Cherkaoui[2], Adnane Benmoussa[1], Soufiane Derraji[2]

[1]Laboratory of Medicine Sciences, Biomedical and Biotechnological Research, Faculty of Medicine and Pharmacy of Casablanca, Hassan II University of Casablanca.

[2]Laboratory of Pharmacology-Toxicology, Faculty of Medicine and Pharmacy of Rabat, Mohamed V University of Rabat.

***Corresponding Author: Dr. Hicham Fettah**

Pharma, Casablanca Morocco 12000.

Article Received on 15/12/2020 **Article Revised on 05/01/2021** **Article Accepted on 25/01/2021**

ABSTRACT

Introduction: Insulin injection is an invasive therapeutic method that diabetic patients use on a daily basis. This is why a good knowledge of good administration practices as well as that of self-monitoring constitutes the basis of this therapy. The objective of this work is to evaluate the administration modalities and self-monitoring of insulin therapy in patients with types 1 and 2 diabetes. **Material and Method:** A three-month prospective study, from 20 September to 20 December 2017, was carried out using a questionnaire comprising 2 grids and a section for collecting data about 100 patients with diabetes types 1 and 2. Data analysis was performed using Excel. **Results:** The 100 patients recruited were between 5 and 82 years old and had an average of 47 years. 9 patients had type 1 (9%) and 91 type 2 (91%). An overall response rate of 100% to questionnaire items was achieved. For the assessment of insulin administration methods: 96% changed injection sites, 96% reused the needle, 95% kept insulin cool, 90% rolled insulin vial before use, 72% reused the needle for 3 days, 71 % purged the syringe or pen, and 57% injected at 90°. This grid resulted in a usage score of 6.32 /10. The evaluation of blood glucose self-monitoring showed: 100% recapped the vial of strips after use, 100% checked that the glucometer was functioning properly, 98.92% changed the sampling site, 96.77% checked their blood sugar before administering insulin, 94.62% washed hands before self-pricking, 93.55% checked their blood sugar before meals, 80.65% checked the expiration date of test strips, 47.32% took daily measurements, and 43% reused single-use lancets. This grid resulted in a self-monitoring score of 8.52/10. **Conclusion:** This study revealed that the methods of administering insulin, were not properly mastered in practice. On the contrary, patients self-monitored their blood glucose correctly except for the lancet reuse practice. A therapeutic patient education program should be incorporated by the media and health professionals to enable patients with diabetes to manage their illness properly.

KEYWORDS: Self-administration - Self-monitoring - Insulin therapy – Diabetes - Patient therapeutic education.

INTRODUCTION

Diabetes is a major public health problem due to its high and growing prevalence on the one hand, and its socioeconomic impact on the other hand.[1] As a result, diabetes is currently one of the most worrying pathologies, both in industrialized and developing countries.

Currently, in Morocco, a country in the midst of a demographic, nutritional, and epidemiological transition, diabetes promises to be an important public health issue and a challenge that doctors and pharmacists are facing in their daily practice.[1,2]

Careful management of diabetic disease is essential. It includes, in addition to controlling all of the associated risk factors, glycemic control, which is a major therapeutic goal. It is clearly established that improved glycemic control slows the progression of diabetes complications[3,4], but factors associated with better glycemic control remain relatively poorly studied in the medical literature. Complex and multidisciplinary, diabetes management includes a set of interventions involving diet, physical activity, and a good medical care. Insulin therapy aims to maintain blood sugar at a near-normal level, but requires a good knowledge regarding insulin delivery and blood glucose self-monitoring modalities.

The objective of this survey research was to evaluate the modalities adopted by patients with either type 1 or type 2 diabetes to deliver insulin and monitor glucose levels to achieve glycemic goals.

MATERIAL AND METHOD

This prospective study was conducted over a period of three (3) months, from September 20 to December 20, 2017. Participants were recruited from different locations in the city of Rabat, Morocco: retail pharmacies, SOS diabetes (a Moroccan association that assists diabetics), dispensaries and the house of diabetic youth. A questionnaire composed of two grids and a section was used to collect data from diabetes patients. The first evaluation grid included the following criteria of insulin administration: keeping insulin cool, purging the syringe or pen, reusing the needle, frequency of changing the needle, rolling the insulin cartridge, injection given at 90° angle, rotating the administration site, and assisting another person. The second grid described the different criteria used to evaluate self-monitoring of blood glucose: monitoring of insulin treatment with a glucometer, verification of the expiration date of test strips, recapping of the test strip vial, use of disposable bleeding needle (lancet), hand washing before puncturing the site, alternating the site testing, measuring blood glucose before or after insulin administration, measuring blood glucose before or after meals, frequency of blood glucose testing, checking the meter is working properly. Each grid was made from ten (10) questions and for each question answered correctly, the notation was returned by a point otherwise it was noted zero.

Data analysis was performed using Excel.

RESULTS AND DISCUSSION

The 100 patients recruited were between 5 and 82 years old with an average of 47 years. 9 patients were type 1 (9%) and 91 were type 2 (91%). According to the series by Virendra et al, only an age above 75 significantly lowered the quality of life of patients with diabetes[5], unlike the American study conducted by S. Sunil Gawade et al in which age had no effect on it.[6]

100% of the participants had responded to the questionnaire survey. Regarding the assessment of insulin administration methods, 95% of patients kept insulin cool, 71 % purged the syringe or pen, 96% reused the needle, 72% reused the needle for 3 days, 90% rolled insulin before use, 57% respected the 90° injection angle, 96% rotated the injection site. This grid resulted in a usage score of 6.32 / 10.

A prospective study performed on 100 diabetic patients at Ibn Rochd University Hospital in Casablanca found that 15% of patients made errors in insulin conservation.[7] Our study showed that the majority of diabetics (95%) were aware of the fact that the insulin should be kept cool.

Regarding the purging of the needle, 407 diabetic children (aged between 10 and 18 years old) were surveyed: 80% did it often, 14% sometimes and 6% never.[8]

An international survey was carried out in 2009 about the technique of self-injection of insulin in 113 adult diabetics.[9] It showed that 22% reused the needle, 63.5% resuspended the insulin before injection, 36.5% did not perform this necessary manipulation.

For those who performed this manipulation, only 30.3% rolled and / or inverted the cartridge or pen at least 10 times immediately before use.[9]

In 2015, another international survey ~~on~~ about the technique of self-injection of insulin in 13,289 diabetic patients was carried out. The needle use frequency was: Twice (44%), 3 to 5 times (32%), 6 to 10 times (12%) and more than 10 times (12%). 44% practiced skin fold and 84% rotated the injection site.[10]

The average score for the evaluation of the administration of insulin was 6.32 / 10. This value represented the degree of involvement of patients in the injection conditions, as well as that of health professionals in diabetes self-management education (**Figure 1**). However, the score indicating good administration of insulin is 8/10 and above. This implies that more efforts should be made to address the issue of tradeoffs over insulin delivery and facilitate cost-effective access to the necessary devices.

Regarding the evaluation of self-monitoring modalities, the results of the survey showed that 93% of patients performed a self-monitoring of blood glucose, 80.65% checked the expiration date of test strips, 100% recapped vial of strips after use, 43% reused disposable lancets, 94.62% washed their hands before self-pricking, 98.92% changed the injection site, 96.77% checked their blood sugar before administering insulin, 93.55% checked their blood sugar before meals, 47.32% took daily measurements, 100% checked that the glucometer is operating properly. This grid resulted in an average self-monitoring score of 8.52 / 10. The self-monitoring obtained in our study (93%) was higher than that found in a study conducted at University Hospital of Fez (72%).[11]

Concerning the expiration date of the vial of test strips, it should be noted that this date depends not only on that indicated on the vial, but also on the date of the first opening. In fact, under normal conditions of use, the storage of a strip after the first opening of the vial is generally 2 to 3 months and these should not be used if they are out of date. It is therefore essential to note the date of the first opening on the bottle.[12]

In our study, 93.55% self-monitor blood glucose before a meal and 6.45% do it after a meal.

The glycemic objectives for diabetes type 1 are: between 0.70 g/l and 1.20 g/l preprandial, less than 1.80 g/l postprandial (2 hours after the meal), greater than 0.65 g/l at night.[13] These recommendations converge to

recommend performing at least 3 or 4 capillary blood glucose tests per day.[4-14] To reach a final HbA1c objective of around 7%, the target glycemic objectives are, for the American Diabetes Association (ADA), between 0.70 and 1.30 g/l in preprandial and less than 1.80 g/l during the postprandial peak, 1 to 2 hours after a meal.[13]

The average score obtained is (8.52 / 10) which is a good self-monitoring score since it exceeds (8/10). However, the bad practice of reusing the disposable lancets may put diabetes patients in danger of contracting diseases (**Figure 2**).

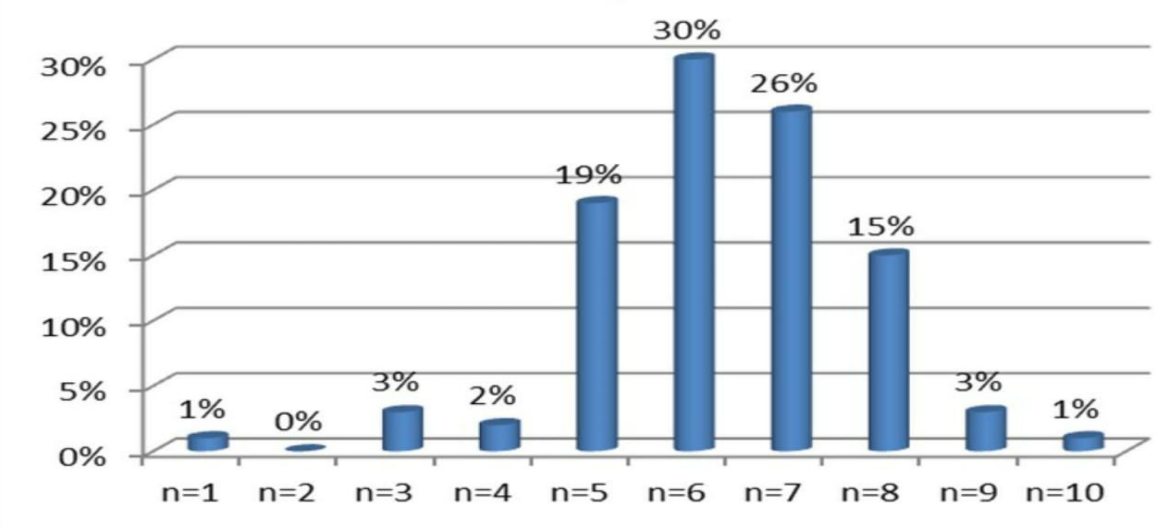

Figure 1: Breakdown of scores for administration methods.

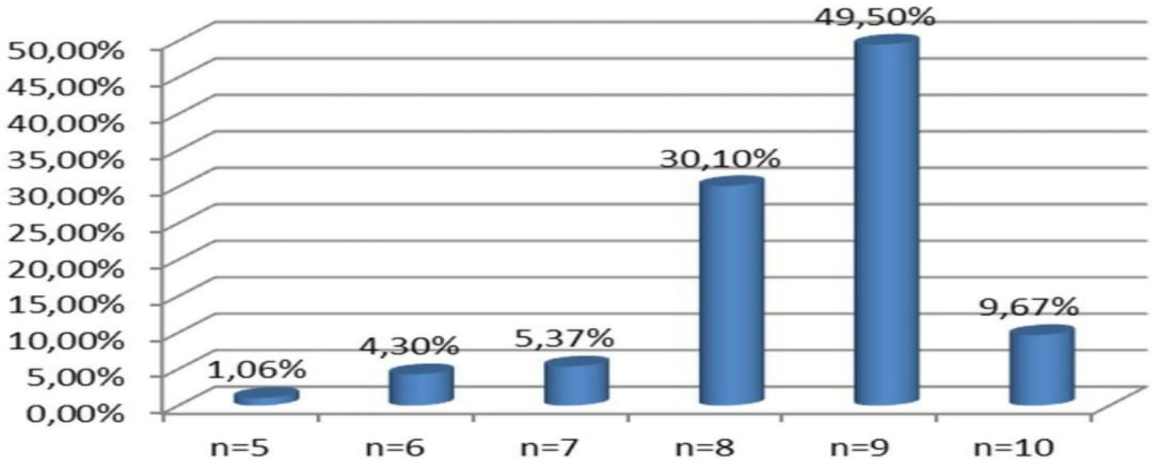

Figure 2: Distribution of self-monitoring scores.

CONCLUSION

Insulin therapy constitutes an effective medical treatment against diabetes. It provides better glycemic control and improves the quality of life of diabetic patients. Insulin injection is an invasive procedure that requires good knowledge of insulin administration methods and a regular self-monitoring of blood glucose to maintain it at a near-normal level.

This survey showed that the modalities of administering insulin were not properly mastered in practice. On the contrary, patients self-monitored their blood glucose correctly except for the lancet reuse practice. A therapeutic patient education program should be incorporated by the media and health professionals to enable patients with diabetes to acquire good skills about how to self-administer the insulin and self-monitor blood glucose.

REFERENCES

1. Farouqi A. et al. Prise en charge du diabète au Maroc : résultats de l'International Diabetes Management Practices Study. (IDMPS) – Vague 2. Médecine des Maladies métaboliques, 2010; 6: 704–711.
2. Mohd. Yaqub Khan, Poonam Gupta, Bipin Bihari, Vikas Kumar Verma. A Review on Diabetes and Its Management. Asian J. Pharm. Res., Jan.-Mar. 2013; 3(1): 27-32.

3. Lizzie Raveendran, Jeyaseelan M. Devadason, Prakash M.Saldanha. Impact of Perceived Self Efficacy on Hba1c among Adolescents with Type 1 Diabetes Mellitus. Int. J. Nur. Edu. and Research, Oct.- Dec. 2014; 2(4): 319-323.
4. Harpreet Kaur. Effectiveness of structured teaching programme regarding self care management in relation to prevention of complications among diabetics. Asian J. Nur. Edu. & Research, July-Sept., 2014; 4(3): 279-283.
5. Virendra Singh Choudhary, Geeta Chaudhary. A Descriptive Study to Assess the Knowledge Regarding Diabetes Mellitus, Its Risk Factors and Complication among the Rural Community Sadiq, Faridkot (Punjab). Asian J. Nur. Edu. and Research, April-June 2015; 5(2): 251-253. doi: 10.5958/2349-2996.2015.00049.X.
6. Smita Sunil Gawade, Nikita, Varsha, Geetanjali, Mamata, Vaishali. A Study to Assess the Factors Hindering in self Insulin Administration among Diabetic Individuals. Asian J. Nursing Education and Research, 2019; 9(2): 248-250. doi: 10.5958/2349-2996.2019.00052.1
7. Addi H. et al. P185 Évaluation du niveau éducationnel des diabetiques sous insuline. Diabetes & Metabolism, 2010; 36: A82.
8. Choleau C. et al. Étude de la technique d'injection d'insuline et des ressentis des jeunes ayant un diabète de type 1: impact sur le suivi éducatif. Diabetes & Metabolism, 2012; 38: A131.
9. Niharika, Rashmi Choudhary, Poonam Sharma. An Analytical Study on Practices Regarding injection Administration among Staff Nurses. Asian J. Nur. Edu. and Research, 2017; 7(3): 384-390. doi: 10.5958/2349-2996.2017.00077.5
10. Sauvanet J.P. and S. Halimi. Technique d'injection de l'insuline: que font les patients diabétiques en France? Médecine des maladies Métaboliques, 2017; 11(5): 406-415.
11. Sincy Wilson, Sr. Symphoria. A Study to assess the effect of awareness Programme on Compliance to Insulin Therapy among Patients with Diabetes Mellitus (DM) in a Selected Community Health Centre, Thrissur District. Asian J. Nur. Edu. and Research, 2016; 6(4): 464-470.
12. Jeenath Justin Doss. K. A study to assess the knowledge and attitude regarding self care activities among the patients with diabetes mellitus in selected hospitals at Coimbatore. Asian J. Nursing Education and Research, 2020; 10(2): 217-218. doi: 10.5958/2349-2996.2020.00046.4
13. Hanaire H. Autosurveillance glycémique et insulinothérapie intensifiée dans le diabète de type 1. Médecine des maladies Métaboliques, 2010; 4: S7-S11.
14. Rapports d'évaluation des fonctions essentielles de santé publique au Maroc. 2016. Available from: file:///C:/Users/user/Downloads/3%20Rapport%20Evaluation%20FESP.pdf