CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3840077

Available online at: http://www.iajps.com *Research Article*

OCCURRENCE OF IN-HOSPITALIZED PATIENTS HYPERGLYCEMIA IN THE MEDICAL DEPARTMENT OF BAHAWAL VICTORIA HOSPITAL (BVH)

Dr. Aina Tariq[1], Dr. Muhammad Waqas Raza[2], Dr. Hafiz Muhammad Hamza Tahir Saleemi[3]

[1,2,3] Bahawal Victoria Hospital, Bahawalpur

Article Received: March 2020 **Accepted:** April 2020 **Published:** May 2020

Abstract:

Objective: *Hyperglycemia (diabetes mellitus or stress hyperglycemia) is very common in hospital settings and has prognostic significance. So far, no study in Pakistan has analyzed the incidence of hyperglycemia in hospitalized medical patients.*

Aim: *To determine the frequency of known diabetes and hyperglycemia in all patients admitted to the medical ward and to determine the frequency of hyperglycemia in various disease categories.*

Methods: *A retrospective study of patients was done in the Medicine department of Bahawal Victoria Hospital (BVH), Bahawalpur for one year duration from April 2019 to April 2020. "Known diabetic patients" were recruited from medical or medical history. "Treatment of hyperglycemia" was defined as having blood glucose ≥180 mg / dl, "Occult hyperglycemia to be tested for diabetes",> 140 mg / dl blood sugar and "Possible undiagnosed diabetes", blood sugar ≥ 200 mg / dl is defined as.*

Results: *Out of 1889 participants who took part in our study, 949 are men and 940 are women. The average age of the studied population was 49 + 19.6. A total of 24.3% (459) of admitted patients (19.5% men and 29.1% women) had diabetes. Among persons unknown as diabetic (n = 1430), 430 (30%) ≥200 mg / dL readings were recorded. Almost 53% of patients were admitted to hospital, their blood sugar level was 40-140 mg / dl. The overall incidence of hyperglycemia treated (≥180 mg / dl) was 48%. Very high blood sugar levels have been found to be 50-350 mg / dL in 13.7% of all hospitalizations. The average blood sugar level in the study population was 210 ± 117 mg / dl, while known diabetics 313 ± 125 mg / dl, while others 177 ± 94 mg / dl. Patients with sepsis, kidneys, liver, heart and stroke had a high percentage of hyperglycemia.*

Conclusion: *Almost 1/4th of our medical admissions are diagnosed diabetics while another third are potentially undiagnosed diabetics. Almost half of the patients are candidate for treatment of hyperglycemia in medical ward.*

Key words: *hyperglycemia, diabetes, blood sugar levels in hospitalized patients.*

Corresponding author:

Dr. Aina Tariq,

Bahawal Victoria Hospital, Bahawalpur

QR code

Please cite this article in press Aina Tariq et al, ***Occurrence Of In-Hospitalized Patients Hyperglycemia In The Medical Department Of Bahawal Victoria Hospital (BVH)****., Indo Am. J. P. Sci, 2020; 07(05).*

INTRODUCTION:

Diabetes is a serious, life-long disease with known short- and long-term complications. Patients admitted to the department worsened glycemic control due to many factors, such as increased insulin resistance due to illness, diet and stress associated with taking medications[1-2]. This increase in insulin resistance also removes the latent diabetes mask and shows hyperglycemia associated with transient stress. In any case, the negative impact of hyperglycemia on the outcome of the disease has been documented. Therefore, many diabetes research legal entities, such as ADA, AACE, Endocrine Society and Diabetes-UK, recommend routine monitoring of blood sugar in each patient in the hospital and suggest different measures to control hyperglycemia[3-4]. It is generally recommended that patients with blood glucose> 180 mg / dl during hospital stay be treated in accordance with established protocols to improve results, and patients with blood sugar> 140 mg / dl. Internationally, a large amount of epidemiological data is available in hospitalized patients representing various diagnosed and undiagnosed diabetic patients.[3-4] In Pakistan, two small studies showed highly known diabetics (31.6%) and newly diagnosed diabetics (29.6%) in patients with acute myocardial infarction[5-6]. A local study in two pediatric wards in patients with ischemic stroke also got worse in a hospital with hyperglycemia. However, in general incidence of hyperglycemia, medical data is completely missing from local data[7]. We planned this study to document the severity of the disease in hospitalized patients.

MATERIALS AND METHODS:

We conducted a study at the Medicine department of Bahawal Victoria Hospital (BVH), Bahawalpur for one year duration from April 2019 to April 2020. Aim of the study; diagnose diabetics, possible undiagnosed diabetes and the frequency of hyperglycemia in patients in a medical ward. During the study period, the Optium Xceed glucose meter measured blood sugar using a diagnosis of diabetes treatment by Abbott. According to the ward routine, blood glucose values in the meter were often checked and compared with simultaneous laboratory values. Various variables were recorded, such as age, gender, known diagnosis of diabetes, highest blood sugar level recorded during hospital stay, and final diagnosis. The known state of diabetes was assessed based on a review of the patient's or family's history and / or medical history or list of medications received by the patient. The patient was designated as diabetic after confirming any of these criteria. The data have been introduced into SPSS 20.0. Frequencies were calculated as a percentage and reported. Patients with diseases from a similar system (e.g. Heart) were grouped in this system, guided only by pivot table analysis. Crosstabs for various blood glucose thresholds were based on gender, known condition of diabetes, and major diagnostic groups. No patient was excluded from the analysis.

RESULTS:

1,889 participants took part in our study. Of these, 949 are men and 940 are women. A total of 24.3% (459) of admitted patients had diabetes. It was 19.5% (185) in men and 29.1% (274) in women. The average age of the studied population was 49 + 19.6. Known diabetics were older (56.9 + 14.5 years) than unknown diabetics (46.5 + 20.37 years). The average blood sugar level in the studied population was 210 ± 117 mg / dL. The average glucose level in known diabetics was 313 ± 125 mg / dl, while for the rest of the group it was 177 ± 94 mg / dl. A cross table of patients with hyperglycemia with different breakpoints showed that both diabetic and unknown diabetic patients had a significant number in each category of hyperglycemia. Therefore, it cannot be said that people with unknown diabetes will not develop severe hyperglycemia (Table 2). Of those without diabetes (n-1430), approximately 53% had blood on 140 mg / dL on admission and 30% had 30-200 mg / dL (Table 1).

Table 1: Possible diabetes (To be investigated) in patients who were not known diabetic (n=1430)

	Total	Male	Female
BSL≥140 mg/dl	53.3% (762/1430)	52.2% (399/764)	54.5% (363/666)
BSL≥200 mg/dl	30.1% (430/1430)	28.7% (219/764)	31.7% (211/666)

Table 2: Distribution of hyperglycemia according to known status of diabetes

	Known diabetic (n=459)	Not known diabetic (n=1430)
BSL≥140 mg/dl (n=1194)	432	762
BSL≥ 200 mg/dl (n=798)	368	430
BSL≥ 350 mg/dl (n=259)	163	96

The addition of known diabetes patients and suspected diabetics (n = 889) places a burden on the diabetes population (47%) of almost half of all medical patients. The frequency of "treated hyperglycemia" (80 180 mg / dl) was 48% (906/1889) among all admitted patients. Very high blood sugar levels have been found to be 50-350 mg / dL in 13.7% of all hospitalizations. The patients with hyperglycemia in a range of ≥180 mg / dl and 50-350

mg / dl, some disease groups appeared with a surprisingly high percentage of patients with hyperglycemia (Table 3).

Table 3: To-be-treated hyperglycemia among all admissions in medical ward (n=1889)

	Overall	Septicemia	Renal Diseases	Liver & GI diseases	Cardiac diseases	Stroke	Respiratory diseases
BSL≥180mg/dl	48% (906/1889)	65.5% (129/197)	57.3% (59/103)	51.8% (233/450)	48.7% (129/265)	52.5% (94/179)	42.7% (35/82)
BSL≥350mg/dl	13.7% (259/1889)	20.3% (40/197)	17.5% (18/103)	13.8% (62/450)	13.6% (36/265)	12.8% (23/179)	11% (9/82)

DISCUSSION:

As far as we know, this is the first study that reported the incidence of hyperglycemia in hospitalized patients in Pakistan[8-9]. The incidence of known diabetes patients in our study is based on history. The patient or family was aware of the diagnosis of diabetes or the doctors were documented in the patient's files based on a review of the medications currently taken by the patient. Therefore, we can confidently report that this 24.3% number is the actual minimum representative percentage of the diabetes population available in our medical services[10]. Authorities are encouraged to use this number to allocate the necessary resources for proper glycemic control by patients. The known incidence of diabetes in our study is higher compared to 13% in the United States (24.3%) and Turkey (23.8%), Australia and patients (24.7%). However, diabetes (> 200 mg / dl) in our study may be of great concern (30% compared to 12.3% in Turkey and 4.5% in the United States) [11]. It emphasizes the importance of improving diabetes at our primary level of healthcare, as well as the Endocrine Association's recommendation for universal blood sugar control for all hospitalized patients[12]. There have been many patients with hyperglycemia. For people who have not been diagnosed with diabetes (both will be examined and treated), 180 mg / dl, half of the requests to the health room require treatment for hyperglycemia. Mark all patients with diabetes / dl, which is 30% of newly admitted patients with diabetes, which is 47% of all admitted patients. This is a huge burden compared to those reported from the USA. United States (12.6%) and Hawaii with Turkey (12.3%) and (3.4%). Our comments on these results are that there are many undiagnosed diabetic patients and the rest is hyperglycemic stress. Although HbA1c can be used to diagnose latent diabetes in hospitalized patients with hyperglycemia suitable for this test, we were not able to monitor all of these patients and we did HbA1c, so we can't say exactly how many of these patients have diabetes[13]. We suggest that this category of patients has hyperglycemia at admission but has not been diagnosed with diabetes or has not been adequately monitored or tested for HbA1c when appropriate. This can give us more accurate data on the severity of the disease. In our study, more women suffered from diabetes than men. We cannot comment on the cause, but more opportunities for physical activity in the open air can help reduce diabetes in men. On the other hand, this could have led to more serious conditions requiring hospitalization, which may reflect poor medical care for our female population. It is noteworthy that in the 2006 Pakistani national diabetes study, In addition to the prevalence of diabetes, glucose intolerance is significantly higher in women, especially in urban areas. Our results may reflect the higher incidence of diabetes in women. The average blood sugar level in our entire study population was 210 mg / dl, while in diabetic patients it was 313 mg / dl. It is the United States (299 mg / dL) and Turkey (for non-surgical patients 173 mg / dL) higher. In our patients, this may reflect poor glycemic control, which is already exacerbated by disease stress. The average age of our study group was 49 years as a whole and 56.9 years for the group of people with diabetes. This age is younger than reported in the US. 72 years in the United States (61 years in patients with diabetes) and Australia. These results have two important consequences[14]. There is a known burden of diabetes, no less than the rest of the world. Secondly, this burden exists at a much younger age compared to other cited studies. If this situation continues and diabetics get old with complications, and younger patients join the group of diabetics, we will have to face the enormous burden of diabetes in our hospitals in the near future, which may exceed our resources. This can destroy our healthcare system. We have identified an equal percentage (13.7%) of patients with severe hyperglycemia (> 350 mg / dl), which may lead to hyperosmolar crisis. These patients often require insulin infusion, frequent monitoring and justified fluid exchange. All this requires proper staff training, dedication of doctors and nurses, and appropriate provision of facilities by management. Hospital officials should take this into account when allocating resources. We have often identified some groups of patients with high blood sugar[15]. We emphasize that hospitals should adopt rules for controlling high blood sugar upon admission, even if these patients are at least impossible. Severe hyperglycemia (> 350 mg / dl) was also observed in the same patient groups.

CONCLUSION:

This study shows the enormous load of hyperglycemia and probably undiagnosed diabetes at a younger age than medical patients and equivalent studies. We should be cautious when assessing all patients for high blood sugar, which may improve treatment outcomes.

REFERENCES:

1. Sugimoto, K., Tabara, Y., Ikegami, H., Takata, Y., Kamide, K., Ikezoe, T., Kiyoshige, E., Makutani, Y., Onuma, H., Gondo, Y. and Ikebe, K., 2019. Hyperglycemia in non-obese patients with type 2 diabetes is associated with low muscle mass: The Multicenter Study for Clarifying Evidence for Sarcopenia in Patients with Diabetes Mellitus. *Journal of Diabetes Investigation*, *10*(6), pp.1471-1479.
2. Kabir, M.A., Kamrul-Hasan, A.B.M., Faruque, M.O., Hoque, F., Selim, S., Hasanat, M.A. and Fariduddin, M., 2019. Frequency and predictors of hyperglycemia in patients with various thyroid disorders attending a tertiary hospital of Bangladesh. *Sri Lanka Journal of Diabetes Endocrinology and Metabolism*, *9*(1).
3. Cardona, S., Tsegka, K.G., Jacobs, S., Albury, B.S., Galindo, R.J., Migdal, A., Halkos, M.E., Keeling, W.B., Miller, J.S., Macheers, S.K. and Guyton, R.A., 2019. 60-OR: Sitagliptin for the Prevention and Treatment of Perioperative Hyperglycemia in Diabetic Patients Undergoing Cardiac Surgery.
4. Nukui, S., Akiyama, H., Soga, K., Takao, N., Tsuchihashi, Y., Iijima, N. and Hasegawa, Y., 2019. Risk of Hyperglycemia and Hypoglycemia in Patients with Acute Ischemic Stroke Based on Continuous Glucose Monitoring. *Journal of Stroke and Cerebrovascular Diseases*, *28*(12), p.104346.
5. Afandi, B., Hassanein, M., Roubi, S. and Nagelkerke, N., 2019. The value of Continuous Glucose Monitoring and Self-Monitoring of Blood Glucose in patients with Gestational Diabetes Mellitus during Ramadan fasting. *Diabetes research and clinical practice*.
6. Uchinuma, H., Ichijo, M., Harima, N. and Tsuchiya, K., 2020. Dulaglutide improves glucocorticoid-induced hyperglycemia in inpatient care and reduces dose and injection frequency of insulin. *BMC Endocrine Disorders*, *20*(1), pp.1-8.
7. Khan, M.A., Sadiq, M., Ali, U., Ullah, S., Shah, S.A. and Gul, H.M.J., 2019. FREQUENCY OF STRESS HYPERGLYCEMIA AMONG PATIENTS WITH ACUTE LEFT VENTRICULAR FAILURE. *Pakistan Heart Journal*, *52*(3).
8. Pasquel, F.J., Tsegka, K., Wang, H., Cardona, S., Galindo, R.J., Fayfman, M., Davis, G., Vellanki, P., Migdal, A., Gujral, U. and Narayan, K.V., 2020. Clinical outcomes in patients with isolated or combined diabetic ketoacidosis and hyperosmolar hyperglycemic state: a retrospective, hospital-based cohort study. *Diabetes Care*, *43*(2), pp.349-357.
9. Depczynski, B., Lee, A.T.K., Varndell, W. and Chiew, A.L., 2019. The Significance of an Increased Beta-Hydroxybutyrate at Presentation to the Emergency Department in Patients with Diabetes in the Absence of a Hyperglycemic Emergency. *Journal of diabetes research*, *2019*.
10. Cardona, S., Tsegka, K., Pasquel, F.J., Fayfman, M., Peng, L., Jacobs, S., Vellanki, P., Halkos, M., Guyton, R.A., Thourani, V.H. and Galindo, R.J., 2019. Sitagliptin for the prevention of stress hyperglycemia in patients without diabetes undergoing coronary artery bypass graft (CABG) surgery. *BMJ Open Diabetes Research and Care*, *7*(1), p.e000703.
11. Oh, G.J., Waldo, A., Paez-Cruz, F., Gipson, P.E., Pesenson, A., Selewski, D.T., Kamil, E.S., Massengill, S.F., Lafayette, R.A., Modes, M. and Adler, S.G., 2019. Steroid-Associated Side Effects in Patients With Primary Proteinuric Kidney Disease. *Kidney International Reports*, *4*(11), pp.1608-1616.
12. Rasoolinejad, M., Najafi, E., Hadadi, A., Najafi, M., Kalantari, S., Moradmand-Badie, B., Tayeri, K. and SeyedAlinaghi, S., 2019. Prevalence and Associated Risk Factors of Hyperglycemia and Diabetes Mellitus Among HIV Positive Patients in Tehran, Iran. *Infectious Disorders-Drug Targets (Formerly Current Drug Targets-Infectious Disorders)*, *19*(3), pp.304-309.
13. Yarragudi, R., Gessl, A. and Vychytil, A., 2019. New-Onset Diabetes Mellitus in Peritoneal Dialysis and Hemodialysis Patients: Frequency, Risk Factors, and Prognosis—A Review. *Therapeutic Apheresis and Dialysis*, *23*(6), pp.497-506.
14. Puangpetch, A., Srisawasdi, P., Unaharassamee, W., Jiratjintana, N., Vanavanan, S., Punprasit, S., Nakorn, C.N., Sukasem, C. and Kroll, M.H., 2019. Association between polymorphisms of LEP, LEPR, DRD2, HTR2A and HTR2C genes and risperidone-or clozapine-induced hyperglycemia. *Pharmacogenomics and personalized medicine*, *12*, p.155.
15. Chawla, R., Nair, R., Sood, V.R., Mukherjee, S. and Arora, A., 2019. Role of naturopathy on physical and biochemical parameters in patients with Type 2 diabetes mellitus.