

Original Research Article

Evaluation of Insulin Prescriptions in Type 2 Diabetic Patients in Jabir Aboeliz Health Center

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Abstract: Diabetes mellitus is a common disease in Sudan and it is a major cause of morbidity, several studies indicate that diabetes is a likely under reported as cause of death. This study aimed to evaluate prescription of insulin in patient with type 2 diabetes. Using the FMOH-NCDs Directorate Sudan Diabetes mellitus guidelines in prospective study involving one hundred outpatients with type 2 diabetes from Jabir Aboeliz Health Center were selected randomly in period from November to December 2015. The study concluded that only 40% of patients' dose comply with the guidelines. The non-complying doses were higher in 4% of the cases than recommended dose and lower in 56%. Using a computerized drug-interaction program, a high proportion of prescriptions (84.21 %) was detected with no interactions.

Keywords: Evaluation, dose, diabetes, type2, insulin.

INTRODUCTION:

Diabetes mellitus is a common disease in Sudan and it is a major cause of mortality, but several studies indicate that diabetes is likely underreported as cause of death. It has high prevalence therefore it is an important health problem. The problems of diabetic care include the lack of efficient diabetic care centers, lack of special trained personnel, poor compliance with therapy or diet [1].

The most recent data come from a small-scale study that was carried out in 1996. The results of the study indicated a prevalence of 3.4%. But recent estimates place the diabetes population at around one million [2]. In Khartoum state, the prevalence of previously diagnosed diabetes was found to be 19.2% as the last results of non-communicable diseases survey in Khartoum state (2013). [2]Unfortunately the attendant economic burden for health care systems is skyrocketing, owing to the costs associated with treatment and diabetes complications. This paper presents the assessment of insulin dose in patient of type 2 diabetes mellitus patients doses were calculated according to "Clinical Practice Guidelines and Standards of Care of Diabetes Mellitus in Sudan updated 2013".[3] The insulin dose recommended by FMOH-NCDs Directorate Sudan Diabetes mellitus guidelines for type 1 is higher than the American Diabetes Association (ADA) and the European

Association for the Study of Diabetes (EASD) and with wide range furthermore the dose for type 2 not mentioned in the guideline and we use the recommended dose for type 1. Insulin is the most effective of diabetes medications in lowering hyperglycemia. It should be introduced earlier, rather than later, in inadequately controlled type 2 diabetes [4].

Both patient and physician often delay the initiation of insulin therapy, but glucose control and patient wellbeing are improved by insulin therapy in patients who have not reached the glycemic target [5]. The interaction in insulin prescriptions were analyzed by using "drug –drug interaction checker" for hundred prescriptions collected during a period from November 2015- December 2015. To evaluate the accurate dose of insulin in patient with type 2 diabetes, we calculate the insulin dose and compare it to FMOH-NCDs Directorate Sudan Diabetes mellitus guidelines.

METHODOLOGY:

The presented study was prospective observational study conducted in representative sample of outpatients type 2 diabetes that shift from oral hypoglycemic agent to insulin from Jabir Aboeliz Health Center .A convenience sample of hundred diabetic patients were selected randomly in period from November to December 2015. Data was collected using

questionnaire, prescription and patient’s file. It was analyzed using computerize SPSS program version 20 and Computerized “Drug –drug interaction checker” (Medscape) was used to check the interaction in a hundred prescriptions. The results were expressed using figures and tables.

RESULTS AND DISCUSSION:

1. Patients’ demographics:

In total of 100 patients were selected for the study who satisfies the inclusion criteria, of which 60 patients were females and the remaining were males.

It was also found that the adults aged between (40-49) were the biggest group (36%)among patient who shifted to insulin, (30%)of patient shift to insulin in age between (50- 59), (34%)of patient shift to insulin in age between(60 – 69).

Fourty percent of cases had long duration of diabetes (>25 years) which might explain by requirement of insulin treatment by a substantial number of individuals with type 2 DM because of the progressive nature of the disorder and the relative insulin resistance that develops in patient with long-standing diabetes.[6]

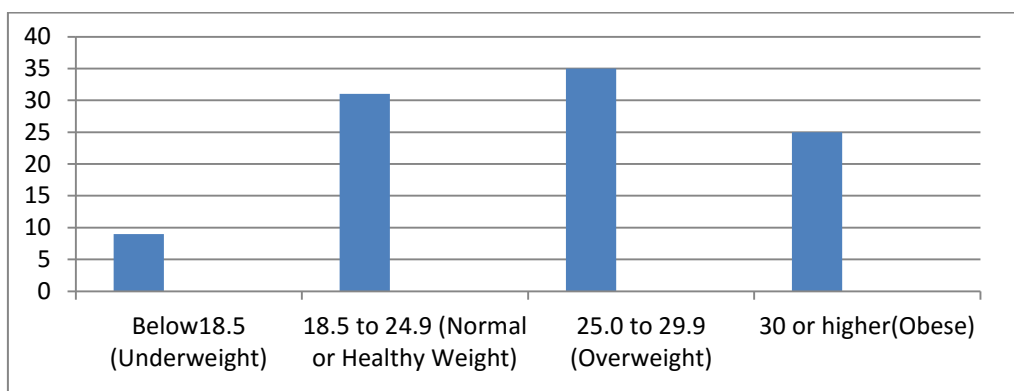


Fig 1: Body mass index for the population:

It was found that (60%) of the patients were obese ,this would decrease the body’s ability to maintain proper blood glucose levels and contribute to insulin resistance leading to failure of oral hypoglycemic drugs.

2. Management of diabetes:

This study shows that 34% of the patient makes regular hospital check up after the shifting to insulin.

Table 1: Regularity of check up after shifting to insulin:

Regular check up	frequency	Percent
Present	34	34.0
Absent	66	66.0
Total	100	100.0

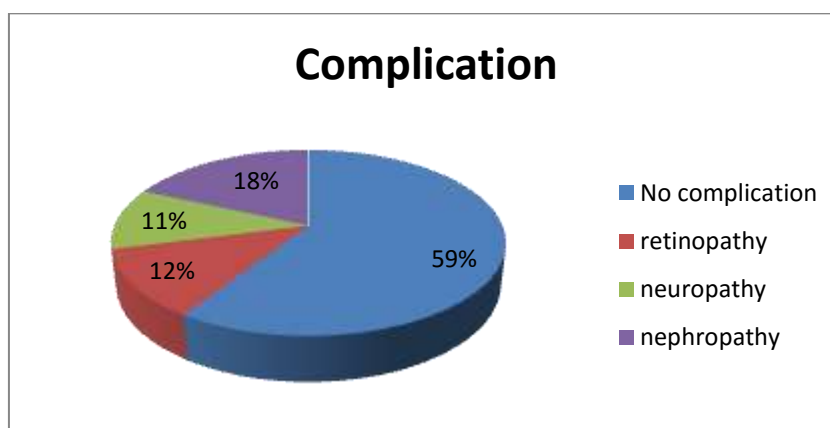


Fig 2: The complication experienced by patients

The study found 59% of cases with no complication and 41% of the cases had complications(retinopathy represent 12%, nephropathy 18%, neuropathy 11%), (73.2%) of them had it before starting insulin therapy .This may be decreased if using insulin early in treatment , especially in patient who

have multi risk factors (genetic, obesity ,family history) and inadequately controlled with oral hypoglycemic agents. The delay in initiation of insulin may be due to cost, patients’ fear of disease progression and needle anxiety, hypoglycaemia and weight gain.[7]

Table 2: Comply of dose compared with FMOH-NCDs Directorate Sudan Diabetes mellitus guidelines (continuation dose 0.6 – 1 IU/kg):

Comply		Frequency	Percent
complying		40	40
Non-complying	Higher	4	4
	lower	56	56
Total		100	100

Table-2 shows 40% of patient use accurate dose while 60% inaccurate (4% higher than and 56% lower than recommended dose). The current study found that the 70/30 insulin mixtard was used for all patients. The dose was divided in two, 2/3 in the morning and 1/3 in the evening .The physician prefer intermediate-acting insulin to avoid hypoglycemia. All patients followed the same regimen.

FMOH-NCDs Directorate Sudan Diabetes Mellitus Guidelines 2013 stated continuation dose of insulin 0.6 – 1 IU/kg for type 1 DM [3]. The study used this range of insulin dose to calculate the doses for type 2 patients switching to insulin. when compared with patients’ dose 40% of the doses comply with the guidelines, the other 60% ; doses were selected according to the clinical experience of physicians.The non-complying doses were 4% higher than recommended dose and 56% lower .which have higher HbA1c and therefore experience complications earlier [8].

The current practice observed in this study could find support from ADA/European Association for the Study of Diabetes (EASD). It declared transitioning from basal insulin to a twice daily premixed (or biphasic) insulin analog (70/30 as part mix, 75/25 or 50/50 lispromix) could also be considered [9]. The HbA1c value which is used to determine the effectiveness of treatment and the basis upon which glycemic control is known to be a mediator of diabetic complications was calculated,47 % of patient Hb A1c more than 10 ,45% between 7 to 10 and 8% less than 7. When correlating the dose of insulin with the Hb A1c found that there is no direct relation between them (P value 0.008) and the poor control may be due to collaborated factor beside the non-complying dose such as obesity and overweight (body mass index more than 25 kg/m²), family history ,long duration of disease , physical inactivity, Hypertension (blood pressure >140/90 mmHg),poor adherence to medications.[10] Moreover the convenient sample size may explain the unpredictable result.

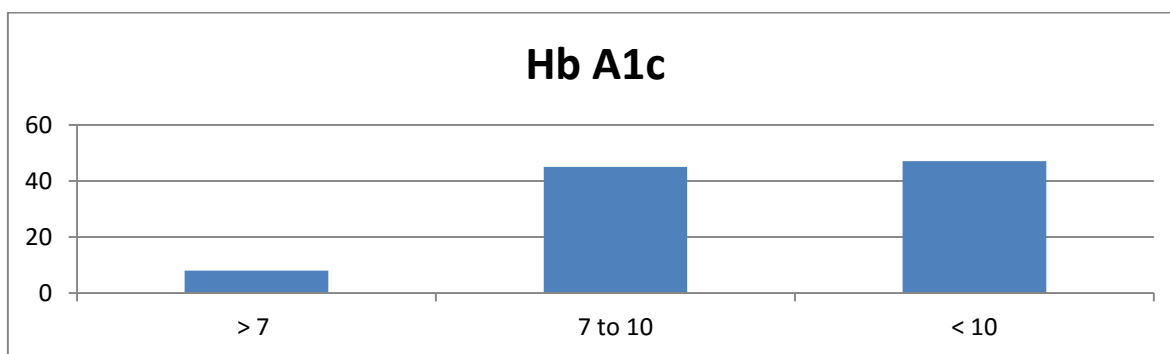


Fig 3: The distribution of the study population according Hb A1c values:

This figure reveals that 90% of patients HbA1c greater than 7. The findings of this study revealed that 57% of the patient used medication others than insulin for co-morbid disease such as angiotensin receptor blockers (losartan) , calcium channel blockers (felodipine), ACE-inhibitors (Lisinopril), beta-blockers(

bisoprolol) , antiplatelets (clopidogril), acetylsalicylic acid and lipid lowering drugs (atorvastatin). Analysis of prescriptions using “drug –drug interaction checker” found no drug -drug interaction in (84.2%) of prescriptions while 5.26% of prescription contains serious drug interactions, 10.52% minor drug

interactions .The drugs accounting for the highest number of potential interactions were NSAIDs, ACE-inhibitors, calcium channel blockers and beta-blockers.[11]

CONCLUSION:

Hundred patients were selected for the study from Jabir Aboeliz Health Center, in Khartoum state. The study concluded that, 40% of patients' doses comply with the guidelines and 60% not comply. The non-complying doses were 4% higher than recommended dose and 56% lower. Using a computerized drug-interaction program, a high proportion (84.21 %) of patients was detected with no interactions.

ACKNOWLEDGEMENTS

The authors appreciate the cooperation of all the physicians, healthcare members of the Jabir Aboeliz Health Center and the patients who participated in the present study.

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