

Analytic Study about Different Oral Antidiabetic Drugs among Diabetic Patients in Cyrina City, Libya

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Abstract: Diabetes mellitus is one of the most common chronic diseases worldwide. Type 2 diabetes mellitus is a progressive and complex disorder that is difficult to treat effectively in the long term. This study was conducted to interviewed 132 patients diagnosed with type 2 diabetes at main center for diabetes treatment in the Cyrina city during period from January 2017 to December 2017. Several parameters were detected, including age, sex, time of disease, levels of (FBS, HBA1C), diabetes duration, hyperatintion and name of antidiabetic drug. Of the 132 patients, 56.06% (n=74), 43.93% (n=58) were female and male respectively, with the mean age of 54 years (30– 85). The most diabetes patient age group was 41-50 years old followed by 51-60 years old (32.4% and 31% of the subjects). Around 82% of pateins had diabetesless than five years ago. Hypertension was present in 17.2% of male and 35% of female subjects. The majority of the patients were overweight. Six antidiabetic drugs were studied and foundout corelation between different drugs with age and diabites duration. In conclusion metformin is the first line treatment for type 2 diabetes mellitus but if there is inadequate response it will be replaced by Janumet. Education is recommended, combined with other preventive measures to reduce complications of disease.

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I. Introduction

Diabetes mellitus is that the commonest endocrine, disorder influencing the composer throughout the world. It displays a paramount heath forethought issue due to its cohorted two- will triple expanded danger about cardiovascular malady Furthermore its secondary pervasiveness furthermore frequency in the Western globe [1], Diabetes mellitus is a chronic disorder of carbohydrate, fatty tissue and protein metabolism portrayed Toward a unseemly rise of the blood glucose level, forwhich a relative (type 2) or absolute lack (type 1) of insulin is responsible[2].

Type 2 diabetes, whereas prior insinuated ought to moreover “non–insulin-dependent diabetes” or “adult-onset diabetes,” accounts for 90–95% about constantly on diabetes. This type includes people who have insulin response safety and normally relative insulin response insufficiency. No less than initially. Furthermore frequently for their lifetime, these people might not requirement insulin response medication to survive(3). Type 2 diabetes has become an increasingly common illness, estimated to affect 380 million individuals around the world by 2025 (4). In Libya population, the type 2 diabetes affected >70% in Libya which is those most elevated pervasiveness over North Africa and "around Arabic countries. The most possible reason is eating habits (5). As stated by WHO, it is approximated that there were 88,000 diabetics in Libya the year 2000. This pervasiveness may be assessed will turn over 245,000 diabetics by those quite a while 2030 [6]. The records of the Diabetes Hospital, Tripoli, Libya for a considerable length of time 1961-1983 were inspected and the accessible particulars identifying with 24,962 diabetic patients enrolled throughout this time were got (7). Prevalence of diabetes in Benghazi over 20 years of age was 14.1% in the quite a while 2000 (8). Recent study demonstrated that family history of diabetes is indeed a powerful independent risk factor for the diabetic in Northeast of Libya (9). However, evidence from these studies is limited, wherein they may not be generalised to the broader Libyan population.

Most patients with this form of diabetes are obese (10), and high risk for both microvascular and macrovascular complications(11), (12). Despite the choice of pharmacologic agents, physicians must stress the non-pharmacologic approaches of diet modification, weight control and regular exercise. Pharmacologic approaches must be based on patient characteristics, level of glucose control and cost considerations. Combinations of various oral agents could also be helpful for treating hyperglycemia before insulin therapy becomes necessary(13). There are now four different categories of oral medications which are able to be used for managing diabetes-sulfonylureas, biguanides, thiazolidinediones, and alpha-glucosidase inhibitors. Each

category works differently to treat the underlying defects of diabetes which include impaired insulin secretion, insulin resistance and exaggerated postprandial hyperglycemia(14).In the United States patients with non-insulin-dependent diabetes mellitus are usually managed with diet and a sulfonylurea drug(15). However, about 30 percent of patients initially treated with a sulfonylurea drug have a weak response, and in the remaining 70 percent the subsequent failure rate is approximately 4 to 5 percent per year(16). In most parts of the world, an alternative or additive approach to oral therapy is available in the form of metformin(17), (18).Clinical expertise has tried Glucophage, either alone or together with an antidiabetic drug, to be safe and efficacious in reducing plasma glucose concentrations in patients with non-insulin-dependent diabetes(19). Metformin is believed to act by inhibiting hepatic glucose production(20) and increasing the sensitivity of peripheral tissue to insulin(21). Metformin conjointly has useful effectson plasma lipid concentrations(22) and promotes weight loss(18), Because the primary action of sulfonylurea drugs is to enhance insulin secretion, whereas metformin exerts its beneficial effects on glycemic control by enhancing peripheral and hepatic sensitivity to insulin(23), metformin should be equally effective when used as monotherapy and in combination with a sulfonylurea drug(20). Therefore, the present study was undertaken to estimate the prevalence and characteristics of different useable antidiabetic drug among diabetic patients in Cyrina city, Libya.

II. Methodology

Diabetes Centre is the outpatient diabetes clinic in Cyrina, and all diabetic patients in the littoral and outskirt regions were on the register in this center. It provides care for diabetics daily, including supplying medications, assessment of metabolic control and advice about managing hypoglycemia, diabetic foot and general health. Services include testing of blood glucose (fasting and post prandial blood glucose levels. This study carried out during the period between January and December 2017. The study population consisted of 132 Libyan patients with type 2 diabetes (74 female and 58 male subjects). Diagnosis of diabetes was based on World Health Organization (WHO) criteria. Demographic profiles including name, age, place of residences, diabetes duration, hypertension, length/weight (Body Mass Index) and name of antidiabetic drug (with dose) were obtained from each subject. Average fasting plasma glucose (FBS) \leq 120mg/dl and 2-hour glucose concentrations (post-prandial plasma glucose (PPFS)) \leq 150mg/dl was recorded. Couple tests were analyzed using glucose MR kit (LNEAR CHEMICALS, Montgat, Barcelona, SPAIN) and spectrophotometers (Humalyzer Junior)). HBA1C was estimated using the CERA-STAT TM 200 HbA1c Test kit (Green cross medis crop, Korea) on auto analyzer using packed red blood cells. The assay is specific for HBA1C is intended for the quantitate determination of glycated hemoglobin in human blood. It also provide the estimated average glaucous value.

III. Results

Over the 132 patients, 56.06% (n= 74), 43.93% (n= 58) were female and male respectively. the most of diabetes patients age group was 41- 50 years old followed by 51- 60 years old (32.4% and 31% of the subjects)as shown in Table 1. Percentage of patients with duration of diabetic was illustrated in Table 2. The highest percentage prevalence of the duration of diabetic was found since 1- 5 years ago, followed by 6- 10years for couple gender.Results in Table 3 were shown results of correlation between gender and presence or absence of hypertension, level of HBA1C and FBS.Overall subject's, data was shown similarity between males and females in term of HBA1C and FBS. However the percentage of presence of hypertension was found high in female with (35.1%) subjects compared to male subjects with (17.2%). However the higher proportion of female patients in the sample of study must be taken into consideration.The oral hypoglycemic agents which used to treat diabetics patient in Cyrina city was shown in Table 4.Overall subjects about 98.5% patients were on Metformin, followed by (53.4%), the lowest percentage of antidiabetic drugs used was for Diamicron, Amaryl and Janumet with 17.3%, 9.02% and 2.3% respectively. As illustrated in Table 5, about the half of diabetics patient (who were on combination diabetic therapy) were treated by Gliburide and metformin, then nearly 15.8% of these subjects were on Diamicron and metformin.

Table 1: Age distribution of diabetic patients at diabetes center in Cyrina city

Age group	No of Male (%)	No of Female (%)
31-40	10 (17.2%)	6 (8.1 %)
41-50	13 (22.4%)	24 (32.4 %)
51-60	18 (31 %)	19 (25.7 %)
61-70	12 (20.7%)	16 (21.6 %)
71-80	5 (8.6 %)	8 (10.8 %)
81-90	0 (0%)	1 (1.4%)
Total	58	74

Table 2: Duration of diabetes among diabetic patients

Years	No of Male (%)	No of Female (%)
1-5	47 (81 %)	61 (82.4 %)
6-10	4 (6.9 %)	5 (6.8 %)
11-15	3 (5.2 %)	5 (6.8 %)
<16	4 (6.9 %)	3 (4.1 %)
Total	58	74

Table 3: Correlation between gender with presence and absence of hyper attention, level of HBA1C and FBS ((Mean ±SD) and No of subjects (%)) for each gender.

Parameters	Male		Female	
	No	Yes	No	Yes
Hyper attention				
No of subject (%)	48 (82.8 %)	10 (17.2 %)	48 (64.9 %)	26 (35.1 %)
HBA1C	<6.9 %	>7 %	<6.9 %	>7 %
Mean (±SD)	8.2 (± 2.5)	9.46 (± 2.4)	7.8 (± 1.6)	9.18 (± 2.01)
No of subject (%)	8 (13.8%)	50 (86.2%)	12 (16.2 %)	62 (83.8 %)
FBS	<109 mg/ml	>110mg/ml	<109 mg/ml	>110mg/ml
Mean (±SD)	91.4 (± 11.7)	174.3(±48.9)	95.7 (± 12.4)	170.2(± 51.5)
No of subject (%)	9 (15.5 %)	49 (84.5%)	12 (16.2 %)	62 (83.8 %)

Table 4: correlation between different antidiabetic drugs with percentage of use, combination of drugs and duration of use antidiabetic drugs.

Parameters	Different diabetic drugs					
	Gliburide	Metformin	Amaryl	Diamicron MR	Januvia	Janumet
Percentage of patient using drugs	53.4%	98.5%	9.02%	17.3%	0%	2.3%
Duration of using drug (less than 10 years)	84.5%	90.1%	83.3%	91.3%	0%	3.3%
Duration of using drug (more than 10 years)	15.5%	9.9%	16.7%	8.7%	0%	66.7%

Table 5: Combination of antidiabetic drugs among diabetic patients

Combination therapy	Percentage (%)
Gliburide + Metformin	50.4%
Gliburide + Amaryl	4.5%
Metformin+ Amaryl	8.27%
Diamicron MR + Gliburide	8.27%
Diamicron MR + Metformin	15.8%
Gliburide + Metformin + Diamicron MR	7.5%

IV. Discussion

Type 2 diabetes mellitus is a progressive and complex disorder that is difficult to treat effectively in the long term. The majority of patients are obese at diagnosis and will be unable to achieve or sustain near normoglycaemia without oral antidiabetic agents (24). In this study in the present study about 98.5% of diabetics patient were treated by metformin especially in the first ten years of the disease, a previous study agreed with this current study which termed that "metformin has been used successfully since the 1950s as first line pharmacotherapy to treat people with type 2 diabetes"(25). On the other hand patients with diabetes for more than ten years were managed by Janumet (metformin/ sitagliptin) with 66.7% because it improves glycemic control in adult patients with type 2 diabetes mellitus inadequately controlled on metformin, and long/intermediate acting insulin(26).

In this study the half of diabetics patient (who were on combination therapy) were treated by gliburide/metformin, with reason of they offer patients more intensive glycemic control within a short period, with fewer side effects and less hypoglycemic episodes(27). Then nearly 15.8% diabetics patient (on combination therapy) were on Diamicron/metformin, since they can supply each other, produce curative effect synergistically, improve metabolic defect in type 2 diabetes mellitus and reduce blood glucose(28).

The present study demonstrated that one third of diabetics patient suffer from hypertension, this statement is in accordance with a study by UK Prospective Diabetes Study Group which stated that " the prevalence of hypertension in type 2 diabetes is higher than in general population, especially in younger patients. at the age of 45 around 40% of patients with type 2 diabetes are hypertensive, the proportion increasing to 60% by age of 75(29).

V. Conclusion

In the current study if we divided these patients according to the duration of the disease into two groups, one who suffer from type 2 diabetes for less than 10 years while the other group for patients who had the disease for more than 10 years, we will notice that the highest percentage was for Metformin followed by Gliburide in the first group, while in the other group the most of patients were treated by Janumet followed by Amarayl. Until more data emerge, a cautious approach to the use of new drugs in diabetic patients seems prudent.

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