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STUDY OF ANTIDIABETIC DRUGS PRACTICE IN INPATIENTS AND OUTPATIENTS OF BOLAN MEDICAL COMPLEX HOSPITAL AND SANDEMAN PROVINCIAL HOSPITAL QUETTA BALOCHISTAN.

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Abstract:

Diabetes mellitus usually referred to as diabetes, it is a group of metabolic disorders in which there are high blood glucose levels over a prolonged period. These symptoms include of high blood sugar frequent urination, increased hunger, and increased thirst. The present study was carried out to assess antidiabetic drugs practice and general tendency of diabetes among patients at two major Hospitals namely Bolan Medical Complex Hospital Quetta and Sandeman Provincial Hospital Quetta, for achievement of comparison results for good glycemic control in diabetic patients. In this regard the data was collected in the form of Prescriptions and complete records of diabetic patients including inpatient treatment charts which were monitored and data was followed as per WHO prescription proforma. The study revealed that inpatient charts of BMCH were contain Insulin (88%), Metformin (14%), Glimepiride (3%), Gliclazide (1%) and combination drugs Sitagliptin and Metformin (3%), Glibenclamide and Metformin (2%) where as the SPH inpatient charts were containing the drug insulin (85%), Metformin (8%), Glimepiride (4%), Pioglitazone (3%), Sexagliptin (1%), Gliclazide (1%), Glibenclamide (1%) and combination drugs Sitagliptin and Metformin (3%), Glibenclamide and Metformin (3%) furthermore the study found that in case of BMCH outpatients drugs were including Metformin (75%), Glibenclamide (20%), Gliclazide (19%), Glimepiride (17%), Insulin (15%), Sitagliptin (7.80%) where as the combination drugs prescribed Glibenclamide and Metformin (2%), Sitagliptin and Metformin (2%) and Pioglitazone and Glimepiride (1%) were found to be maximum among several available antidiabetic drugs. Category wise the maximum prescribed drugs in inpatients were almost Insulin (88%) Metformin (14%, biguanide) Glimepiride (8%, Sulfonylurea category), and (Pioglitazone 4%, Glitazone category). Sexagliptin and Gliclazide was prescribed very less (1%). Study found that the disease which was very common among diabetic inpatients was hypertension (58%). In age groups the highest prevalence in inpatients of BMCH and SPH was same 51 to 60 and BMCH outpatients were found in the age of 41 to 50. Women patients (54.44%) were found to be predominate over Men patients (46.64%).Present study also showed that the number of patients were more with type ll diabetes than the patients with type l, and most of the patients were diagnosed with diabetic foot.

Keywords: *Diabetes Mellitus, inpatient, outpatient, antidiabetic drugs.*

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INTRODUCTION:

DIABETES MELLITUS "Diabetes mellitus" is known as a group of metabolic disorders which causes hyperglycemia due to insulin secretion defect resulting, action of insulin or both. It is one of the major and general metabolic syndromes, as in the world there are 200 million diabetic patients, this is the need to get awareness about the etiology of condition and also the factors that influence its onset. Numerous pathogenic processes are concerned in the improvement of diabetes; these are related to understand the β-cells autoimmune destruction in pancreas with insulin deficiency to abnormalities which resist insulin action. Insulin deficiency on hyperglycemia and target tissues are due to abnormalities in fat, carbohydrates and protein metabolism causes complicated clinical features micro and macrovascular and greater risk of cardiac disease as well [1]. Blood glucose regulation is depending on negative response and releasing of insulin and glucagon. When glucose level become high in the blood the β-cells of the islet of langharans in pancrease are forced to release insulin , two chains (A and B) which contains 51-amino acid polypeptide are linked by di-sulphide bridges. Insulin is synthesized by the pro-hormone convertases (PC I and PC2) and exo-protease carboxypeptidase as pro-insulin.' These enzymes action insulin and Cspeptide." [2]. Data analysis from clinical trials found greater risk of cardiovascular disease myocardial infarction and death related to cardiovascular causes in relation to practice of rosiglitazone, even though analysis and further studies unsuccessful to imitate this result [3]. Insulin sensitiser Rosiglitazone is used in combination with sulfonylurea, Metformin, or both, for decreasing blood glucose in type 2 diabetes. cardiovascular outcomes are assessed after addition of rosiglitazone to either sulfonylurea or metformin compared with the combination summarize of the two over 5-7 years and comparative safety is also assessed [4]. Glucose management makes a variation with diabetic patients. Fall of mean glycaemia delays or prevents complications related to microvascular nephropathy, neuropathy and retinopathy - in both type diabetes mellitus. Preventive feature in diabetes for glycaemic management of disease. Diabetes would be treat very easily if the strongly destructive property of hypoglycaemia was not on the brain. Sufficient insulin, or any valuable drug, to decrease the concentrations of glucose in plasma or lower the normal range would reduce the hyperglycaemia symptoms, the acute hyperglycaemic complications (hyperosmolar syndrome ,ketoacidosis), nearly to stop the long-standing microvascular complications [5]. Complete therapeutic insulin overload become the cause of plasma glucose concentrations to refuse in Type I diabetes. Insulin concentrations do not decrease as glucose concentrations decrease, they are unfettered and the outcome of passive absorption of insulin which is administered. Moreover, concentrations of glucagon do not raise [6] . As a result, the responses of glucagon to hypoglycaemia are decreased in complex Type II diabetes, the patients who impending the insulin- deficient end of the variety of Type II diabetes, as they are in Type I diabetes. Such patients, and other group of less controlled patients effected by Type II diabetes ,oral agents are used in their treatment, were studied again after induction of hypoglycaemia two episode the previous day. This current ancestor hypoglycaemia was exposed to move the glycemic thresholds for autonomic "including epinephrine" and responses that are symptomatic, with further responses, to consequent hypoglycaemia to decrease plasma glucose concentrations in Type II diabetes, which does in Type I diabetes. Hence, advanced Type II diabetes patients are at greater risk for increasing malfunctioning glucose hypoglycaemia and counter regulation ignorance, the mechanism of hypoglycaemia related to autonomic failure, similar to that which happens in Type I diabetes. This might make clear why iatrogenic hypoglycaemia confines glycemic control as patients come near to insulin deficient conclusion of the spectrum of Type II diabetes [7]. Lowering plasma glucose concentrations against decrements in insulin and increments in glucagon and epinephrine come out to be conserved early in Type II diabetes. Though, it can be compromised by time as the patient reaches the insulin deficiency of the spectrum of Type II diabetes. Therefore, greater the hypoglycaemia risk in Type II diabetes approaches that in Type I diabetes [8]. People with type ll diabetes have a larger occurrence of, cerebrovascular disease, cardiovascular disease and renal disease than the common population. Studies of epidemiological advise that absolute hyperglycaemia accounts for measurement but not all of the greater risk. [9] 40% of patients with type 2 diabetes are hypertensive at the age of 45, the number of patients are increasing to 60% by the age of 75 [10].

METHODOLOGY:

The present study was conducted to establish the current antidiabetic drugs practice in inpatients and outpatients of Bolan Medical Complex Hospital (BMCH) and Sandeman Provincial Hospital Quetta Balochistan (SPH). These two major Hospitals fulfill the needs of patients in Province so therefore the study was carried out in diabetic patients for glycemic control . Study is designed as percentage of

patients group age, selection of anti diabetic drugs in categories, hypertensive drugs as well as the combination drugs.

Compilation of data was done in inpatients by the hospital records which included the patients complete ward record, patient history sheet, treatment chart, as well as patient investigation reports and discharge cards. In case of inpatients the numbers of charts were 180 in both hospitals but for OPD patients the prescriptions were 140 collected by BMC Hospital Pharmacy for study which contained the patients name, age and prescribed drugs with dose and dosage form. Data was collected from April 2016 to 2017 for study.

RESULTS:

Among 180 diabetic inpatients women were more than (50%) and men were less than (50%) which showed that the women were predominate than the men. (Table 1, A-B)

Outpatients study showed that the women were again more than (50%) than men. (Table 1, C)

In inpatients drugs practice showed that the drug insulin was used (88%) in BMCH inpatients and (85%) in SPH inpatients. (Table 2, A-B) oral drug Metformin was used in BMCH (14%) and (8%) in SPH patients. Glimepiride was prescribed (3% to 4%) in both hospitals. Pioglitazone was the drug which prescribed in SPH inpatients 3%. The drug Gliclazide was used very less (1%) in both hospitals. The combination drugs Sitagliptin and Metformin, Glibenclamide and Metformin 2% and 3% in inpatients. The drugs practice in outpatients of BMCH found that Metformin used in most of the patients (75%). Glibenclamide (20%), Gliclazide (19%), Glimepiride (17%), Insulin was prescribed (15%), Sitagliptin (7.80%) , the combination drugs Glibenclamide and Metformin 2%, Sitagliptin and Metformin 2% each and Pioglitazone and Metformin combination used only 1%. (Table 2, C) Antihypertensive drugs prescribed in inpatients of BMCH (42.22%) where as in SPH inpatients it was prescribed (58.88%) and in outpatients of BMCH antihypertensive drugs prescribed (35.71%). (Table 3, A-B-C).

In inpatients data it was found that the other drugs which were prescribed mostly included, Ceftriaxone, Ciprofloxacin, Metoclopramide, Omeprazole and Metronidazole.

Table 1 (A): BMC Inpatients Age Sex Distribution

S/No	Age Group	Men	Women	Total
1	1 to 20	1	0	1
2	21 to 30	8	2	10
3	31 to 40	5	8	13
4	41 to 50	8	13	21
5	51 to 60	10	17	27
6	61 to 70	7	7	14
7	71 to 80	3	1	4
8	81 to above	0	0	0
	Total	42	48	90
	Total %	**46.66%**	**53.33%**	**100%**

Table 1 (B): SPH Inpatients Age Sex Distribution

S/No	Age Group	Men	Women	Total
1	1 to 20	1	2	3
2	21 to 30	1	3	4
3	31 to 40	10	3	13
4	41 to 50	7	11	18
5	51 to 60	10	21	31
6	61 to 70	9	6	15
7	71 to 80	2	3	5
8	81 to above	1	0	1
	Total	41	49	90
	Total %	**45.55%**	**54.44%**	**100%**

Table 1 (C): BMCH Outpatients Age Sex Distribution

S/No	Age Group	Men	Women	Total
1	1 to 20	1	1	2
2	21 to 30	2	3	5
3	31 to 40	7	17	24
4	41 to 50	19	27	46
5	51 to 60	17	21	38
6	61 to 70	11	9	20
7	71 to 80	1	4	5
8	81 to above	0	0	0
	Total	58	82	140
	Total %	**41.42%**	**58.57%**	**100%**

Table 2 (A): BMCH Inpatients Drug Percentage %

S/No	Name Of Drug	Prescribed Dosage Form	Number Of Times Drug Prescribed	% Of Total Antidiabetic Drugs Prescribed
1	Insulin	Inj 100IU	80	88%
2	Metformin	Tablet (500mg)	13	14%
3	Glimepiride	Tablet (1mg, 2mg, 3mg)	3	3%
4	Gliclazide	Tablet (80mg)	1	1%
6	Sitagliotin+Metformin	Tablet (50mg+500mg)	3	3%
7	Glibenclamide+Metformin	Tablet (5mg+500mg)	2	2%

Table 2 (B): SPH Inpatients Drug Percentage %

S/No	Name Of Drug	Prescribed Dosage Form	Number Of Times Drug Prescribed	% Of Total Antidiabetic Drugs Prescribed
1	Insulin	Inj 100IU	77	85%
2	Metformin	Tablet 500mg	8	8%
3	Glimepiride	Tablet (1mg, 2mg, 3mg)	4	4%
4	Pioglitazone	Tablet (15mg, 30mg)	3	3%
5	Saxagliptin	Tablet (2.5mg)	1	1%
6	Gliclazide	Tablet (30mg,80mg)	1	1%
7	Glibenclamide	Tablet (5mg)	1	1%
8	Sitagliptin+Metformin	Tablet (50mg+500mg)	3	3%
9	Glibenclamide+Metformin	Tablet (5mg+500mg)	3	3%

Table 2 (C): BMCH Outpatients Drug Percentage %

S/No	Name Of Drug	Prescribed Dosage Form	Number Of Times Drug Prescribed	% Of Total Antidiabetic Drugs Prescribed
1	Insulin	Inj 100IU	21	15%
2	Metformin	Tablet 500mg	106	75%
3	Glimepiride	Tablet (1mg, 2mg, 3mg)	25	17%
4	Gliclazide	Tablet (30mg,80mg)	27	19%
5	Glibenclamide	Tablet (5mg)	28	20%
6	Sitagliptin	Tablet (25mg,50mg,100mg	11	7.80%
7	Pioglitazone+Glimepiride	Tablet (15mg+1mg)	1	1%
8	Glibenclamide/Metformin	Tablet (1.25mg,2.5mg,5mg 500MG	2	2%
9	Sitagliptin+Metformin	Tablet (50mg+500mg)	2	2%

Table 3 (A): Bolan Medical Complex Hospital Quetta Inpatients Drug Distribution

No Of Drugs In Inpatient Charts	No Of Patient Charts	No Of Patient Charts Containing Oral Anti Diabetic	No Of Patient Charts Containing Insulin	No Of Patient Charts Containing Antihypertensive Drugs	No Of Patient Charts Containing Combination Drugs	No Of Patient Charts Containing Other Drugs
2	2	-	2	-	-	2
3	7	-	5	-	-	16
4	9	2	9	1	1	23
5	13	3	9	3	1	49
6	11	2	11	1	-	52
7	12	1	12	8	-	63
8	13	5	11	4	2	82
9	8	1	9	5	-	57
10	10	2	8	8	1	81
11	2	1	1	1	-	19
12	1	-	1	2	-	9
13	1	-	1	4	-	8
14	1	-	1	1	-	12
Total	90	17	80	38	5	473
Total %	**100%**	**18.88%**	**88.88%**	**42.22%**	**5.55%**	

Table 3 (B) : Sandeman Provincial Hospital Quetta Inpatients Drug Distribution

No Of Drugs In Inpatient Charts	No Of Patient Charts	No Of Patient Charts Containing Oral Anti Diabetic	No Of Patient Charts Containing Insulin	No Of Patient Charts Containing Antihypertensive Drugs	No Of Patient Charts Containing Combination Drugs	No Of Patient Charts Containing Other Drugs
2	2	-	1	-	-	3
3	2	-	2	-	-	4
4	13	-	9	4	-	39
5	10	-	12	5		33
6	19	2	14	13	1	84
7	16	3	16	10	1	82
8	6	2	6	2	-	38
9	9	4	7	10	2	58
10	8	3	6	3	1	67
11	4	3	3	5	1	32
12	1	1	1	1	-	9
Total	90	18	77	53	6	449
Total %	**100%**	**20%**	**85.55%**	**58.88%**	**6.66%**	

Table 3 (C): Bolan Medical Complex Hospital Quetta Outpatients Drug Distribution

No Of Drugs Prescribed in out-patients	No Of Prescriptions	No Of Prescriptions Containing Oral Anti Diabetic	No Of Prescriptions Containing Insulin	No of Prescriptions Containing Antihypertensive Drugs	No Of Prescriptions Containing Combination Drugs	No of Prescription sContaining Other Drugs
1	17	4	12	1	-	0
2	37	61	3	2	-	8
3	39	59	1	7	2	48
4	25	38	1	19	1	41
5	15	27	1	14	-	33
6	6	6	2	4	1	23
7	1	1	-	3	1	2
Total	140	196	20	50	5	155
Total %	**100%**	**140%**	**14.28%**	**35.71%**	**3.57%**	

DISCUSSION:

The present research found that in inpatients drug insulin was prescribed mostly and in outpatients oral drug Metformin was the drug which used in most of the outpatients.

Treatment with diet, Metformin, Sulfonylurea or insulin is known to improve blood glucose levels [11]. Primarily all were controlled by diet alone, with successive randomization to long-lasting with diet alone, or with, Metformin, sulfonylurea or insulin therapy. Since type 2 diabetes is characterized by steady worsening of glucose manage due to β-cell dysfunction [12]

Metformin is an insulin sensitizer well known as a first-line drug for management of type 2 diabetes. Though, insulin has some limitations. It is normally given by subcutaneous injection, regularly requiring multiple injections daily. Insulin has a tangible risk of hypoglycemia, and regularly required glucose monitoring. It belongs to the biguanide catagory and having antihyperglycemic effect with minimum risk of hypoglycemia. Metformin lower down blood glucose concentration and makes better insulin sensitivity by decreasing hepatic gluconeogenesis and enhances insulin-stimulated peripheral glucose uptake, The ADA-EASD guidelines suggest addition

of insulin as second-step alternative for patients who are not sufficiently controlled on monotherapy of metformin or as a third step alternative for patients who still do not reach the HbA1C target goal on oral combination treatment. Insulin is also dealing patients with severely uncontrolled or symptomatic type 2 diabetes [13]. Furthermore, metformin lowers insulin resistance in liver and muscle tissue, reducing postprandial hyperglycemia and also inhibits adipose tissue lipolysis thus lowering circulating levels of FFAs [14]. Metformin independently shows action on glucose, may also suppress inflammation, insulin and FFAs [15]. Type 2 diabetic patients who are overweight, metformin use decreases macrovascular mortality and morbidity, properties that appear to be independent of the development in glycemic control [16]. Numerous different analogs of insulin are existing for type-1 and advanced type-2 diabetic patients. The inject able insulin types depends on their onset and duration. Insulin treatment frequently has two components, an intermediate acting or long-acting insulin used at bedtime, and a rapid-acting insulin used before meals. It is usually related with weight gain that extensively increases in patients on demanding insulin therapy [17].

CONCLUSION:

Insulin and Metformin were the most common antidiabetic agents used among the different antidiabetics prescribed. The present study found that women were predominant than man, this study needs further investigations.

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