



**CASE STUDY: AN EMERGENCY CASE DIAGNOSED WITH UNCONTROLLED
HYPERGLYCEMIA AND GLAUCOMATOUS WAS TREATED AS TYPE 2 DIABETES.**

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ABSTRACT

Type 2 Diabetes mellitus (T2DM) is a metabolic syndrome which steadily develops many complications after several months of confirmed diagnosis if hyperglycemia is not controlled. Usually complications like glaucomatous, fatty liver and prostate enlargement develop in chronic T2DM. We report a case of emergency condition with no history of T2DM and its complications, now confirmed Diabetes along with unusual complications of glaucomatous, fatty liver and prostate enlargement which are expected to be seen after several months of T2DM development. The patient history of addicted alcoholism gave clue to clarify the manifestation of unfamiliar complications at the time of diagnosing T2DM. The patient was referred to psychiatrist in order to de-addict the habits of alcoholism and treated with anti-pyretics, oral hypoglycemic, anti-alcoholic and few other supportive drugs to improve patient condition. This case report suggests early development of critical diabetic complications at the time of T2DM diagnosis in chronic alcoholism.

KEYWORDS: Type 2 diabetes mellitus (T2DM), glaucomatous, chronic alcoholism, hyperglycemia and Diabetes mellitus (DM).

INTRODUCTION

Diabetes mellitus (DM) is considered one of the leading causes of death due to various complications caused by uncontrolled management of hyperglycemia.^[1] The approach of therapy through anti diabetic drugs play crucial role in controlling blood glucose level within normal range.^[2] Apart from this, resolving psychosocial issues, changing life style with healthy diet, physical activity and regular exercise promote self-disease management by stimulating insulin secretion and enhancing insulin sensitivity in diabetic patients.^[3] Once diagnosed, Diabetic patients should take proper treatment and regular care in order to reduce expected complication.

CASE REPORTS

A 56 years old male was admitted at Apollo BGS Hospital, Mysore (Karnataka) in emergency condition on 05/09/2011. He was investigated thoroughly physical examination, blood and urine tests, Ultrasonography (USG), Echocardiography (ECG), Optometry and also consulted psychiatrist.

Physical Examination on 05/09/2011

The patient had body ache and appeared feverish. Clinical examination showed Pulse: 90/min, Blood Pressure: 110/80 mmHg, CVS: S1, S2 heard, RS: Clear

and PA/(Central Nervous System) CNS : (No Abnormal Detected) NAD.

Laboratory Investigation

Blood sample was taken in order to study complete blood count, complete urine analysis, fasting blood sugar (FBS), post prandial blood sugar (PPBS), random blood sugar (RBS), glycosylated hemoglobin (HbA1C), lipid profile, urea, creatinine, uric acid, serum bilirubin, SGOT, SGPT, ALP, GGTP(IFCC), total protein, Albumin, Globulin, Sodium, Potassium and Chloride. These investigations were carried out by the hospital laboratory itself. The tested reports showed elevated blood glucose, urine sugar, urine spot micro albumin-creatinine ratio, glycosylated hemoglobin and triglycerides. The patient was diagnosed with Type 2 diabetes. The test was repeated periodically from 06/09/2011 to 03/02/2015 in order to know the prognosis of the diabetes over the prescribed medications. (Table No. 1 to 5).

Special Investigation

Special investigation includes (Ultrasonography) USG, ECG and eye examination which were carried by the hospital itself. USG report suggested prostate enlargement and fatty liver (Figure 1 & 2). ECG reports showed Left ventricle dysfunction and trivial mitral

regurgitation (Figure 3 & 4). Eye examination showed right optic atrophy and glaucomatous (Figure 5 & 6).

COURSE OF THERAPY

In routine medications, the patient was prescribed with anti-alcoholic, anti-glaucomatous and anti-diabetic drugs followed by follow up for routine examination in order to know the prognosis of suggested therapy.

Glaucomatous Therapy

During the course of medication, TRAVO eye drop was given at night around 9PM and MISOPT/DORZOX –T eye drop was suggested totake twice a day at 8AM and 8PM since 10/05/2011. On 07/09/2011, the eye drop was replaced with IOTIME 0.5% to be given twice a day at 8 AM and 9 PM. Again on 15/12/2011, the eye drops was replaced with TRAVO and IOTIME 0.5%. The use of these eye drops were suggested to continue.

Laboratory Investigation

Investigations	06-09-11	03-05-12	06-05-14	Reference Range*
Colour	Pale Yellow	Pale Yellow	Pale Yellow	
Appearance	Clear	Clear	Cloudy	
pH	6	6	6	
Specific Gravity	1.03	1.03	1.03	
Protein	Nil	Nil	Nil	
Glucose	2+	1+	2+	
Ketones	Nil	Nil	Nil	
Bile Pigment	Nil	Nil	Nil	
Bile Salt	Nil	Nil	Nil	
Urobilinogen	Normal	Nil	Nil	
Microscopic Examination				
Pus cells	2-4 /HPF	1-2 /HPF	4-6 / hpf	
RBCs	Nil	Nil	Nil	
Epithelial Cells	Few	Few / LPP	2-4 / lpf	
Casts	Nil	Nil	Nil	
Crystals	Nil	Nil	Nil	
Yeast	Nil	Nil	Present	
Microalbumin & Creatinine Ratio				
Urine Spot Microalbumin	24.5	Nil	12.9	<30
Urine Spot Creatinine	45.1	Nil	45.2	39-259
Microalbumin-Creatinine ratio	54.3	Nil	48.9	<30

*This reference range was considered according to the hospital laboratory.

Investigation	06-09-11	03-05-12	06-05-14	Reference Range*
Hemoglobin	16.4	15	15.9	13.0-18.0
RBC count	5.33	4.25	5.61	4.5-5.5
PCV	46.9	34.8	46.4	40-50
MCV	88.1	81.8		78-100
MCH	30.9	35.3		37-32
MCHC	35	43.2		30-36
WBC count	6800	8070		4000-11000
Neutrophils	54	54	65	40-75
Lymphocytes	35	36	30	20-45
Eosinophils	4	4	3	01-06
Monocyte	7	6	2	02-10
Basophils	0	0	0	00-02
Platelet Count	223000	337000	220000	150000-450000
ESR	4	15		<15

*This reference range was considered according to the hospital laboratory.

Date	Peripheral Blood Picture
06-09-11	Blood Picture: Normocytic normochromic. WBCs are normal in total and distribution. Platelets appear normal in number. Impression: Normal blood picture.
03-05-12	Blood Picture: Normocytic normochromic. WBCs are normal in total and distribution. Platelets appear normal in number. Impression: Normal blood picture.

Date	Results		
	FBS	PPBS	RBS/GRBS
14-09-11	139	228	
15-12-11	99	189	
02-05-12			198
12-11-13			345*
03-05-14		503	
03-11-14	69	205	
06-05-14	415	556	
05-06-14	76	268	

* Test done with glucometer
Reference Range*: FBS- 60-110 mg/dl,
Glycosylated Hemoglobin (HbA1C)

Date	Result
25-04-12	5.8
22-01-13	5.9
12-11-13	14.6
06-05-14	12.9
08-08-14	6.7
03-11-14	6.3
03-02-15	6.1

Reference Range*: >8 Action suggested;
* This reference range was considered according to the hospital laboratory.

Investigation	06-09-11	06-05-14	Reference Range*
Cholesterol (CHO-PAP)	141	137	<200
Triglycerides (GPO)	82	214	<200
HDL (Direct)	34	32	>or = 35
LDL (Calculated)	90.6	77	<130
VLDL (Calculated)	16.4	43	<50
Urea	20	19	27
Creatinine	1	0.9	1
Uric acid	3.4		3.5-7.2
Sodium	141		136-145
Potassium	4.6		3.5-5.1
Chloride	101		98-107
Bilirubin, Total (Diazo)	0.8		0.2-1.1
Bilirubin, Direct (Diazo)	0.2		0.0-0.3
Bilirubin, Indirect (Calculated)	0.6		0.2-0.8
SGOT (AST) (IFCC)	16	28	<35
SGPT (ALT) (IFCC)	23	45	<45
ALP (Alkaline Phosphate)	183		<258
GGTP (IFCC)	15		<55
Protein Total, serum (Biuret)	6.5		6.3-8.4
Albumin, Serum (BCG)	4.4		3.5-5.0
Globulin, Serum	2.1		2.3-3.5

*This reference range was considered according to the hospital laboratory.

Special Investigation



Figure 1: USG report dated 06/09/2011 shown prostate enlargement (measures 4.1 X 9 X 3.7cm, 32ml volumes and 16.4ml post-void residue).

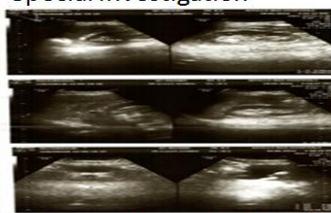


Figure 2 : USG report dated 19/05/2014 shown progressive enlargement of prostate (measures 5.2 X 4.5 X 4.3 cm, 54.1ml volume and 25 ml post void residue show) and fatty changes in liver.

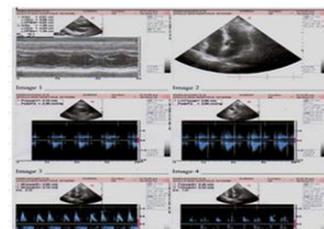


Figure 3: ECG report dated 02/05/2012 shown that normal valves and chambers, good LV systolic function (LVEF 69%), LV diastolic dysfunction and tricusid mitral regurgitation.

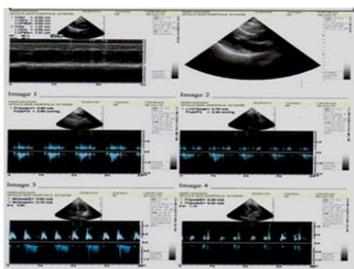


Figure 4: ECG report dated 25/06/2013, shown normal LV RWMA, normal valves, good LV/RV function, no pericardial effusion and LV diastolic dysfunction+

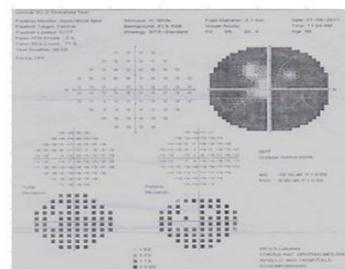


Figure 5: Eye examination dated 06/09/2011 shown right optic atrophy and glaucomatous

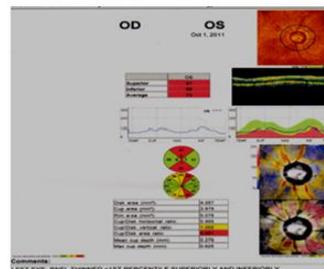


Figure 6: Eye examination dated 01/10/2011 shown left eye was diagnosed with glaucoma

Diabetes Mellitus Therapy

Since 14/09/2011, the patient was prescribed intermittently with various combinations of suitable drugs in order to achieve euglycemia (Table no 6).

Table No. – 6

Date of prescription	Prescribed Medication	Health effects after intake of drugs
14-09-11	GLYCOMET GP1 ⁴ before meals, twice a day for one month	Increase release of insulin by pancreas
	VIMINTA FORTE every morning for one month	Act as an adjuvant for diabetic drugs
15-12-11	GLYCOMET GP1 ⁴ before meals	Increase release of insulin by pancreas
	Cap. NOVA PLUS every night	Manage neuropathic pain associated with diabetes
27-04-12	JALRA M ⁵ (50/500) every morning	Produce more insulin and less glucagon in pancreas.
	GLYCIPHAGE ⁶ 500mg every night	Restores insulin function
	S-CITADEP 10mg every night at bedtime for 50 days	Relieve depression and anxiety.
	Cap. NOVA PLUS every night	Manage neuropathic pain associated with diabetes
12-11-13	LOSCAR 50mg every night	Control hypertension
	GALVUMET ⁷ (50/500) every morning	Improve glycaemic control
	TRIVOLIB ⁸ 2mg twice daily before meals	Reduce blood glucose after meal.
	IMMUNACE FORTE every morning	Keep blood sugar normal.
	SR PEVESCA PLUS every night	Relieve anxiety
	MEGAZA CAPSULE twice a day	Reduce blood triglyceride
	LEVEMIR insulin ⁹ (20 unit every night)	Lower blood glucose.
06-05-14	TRIMETADAY V2 twice a day before meals	Reduce blood glucose absorbed in intestine as predictor to liver.
	LOSCAR 50mg every night	Control hypertension
	SR PEVESCA PLUS every night	Relieve anxiety
	NOVAMIX ¹⁰ (30/70) insulin (15-0-25 unit) twice daily	Decreased blood glucose over prolonged period of time.
05-06-14 and 09-08-14	NOVAMIX ¹⁰ (30/70) insulin (20-0-22 unit) twice daily	Decreased blood glucose over prolonged period of time.
	TRIMETADAY V2 twice a day before meals	Reduce blood glucose absorbed in intestine as predictor to liver.
	ISTAMET ¹¹ (50/500) twice a day	Reduce glucose level by ability to restore.
	LOSCAR 50mg every night	Control hypertension
	SR PEVESCA PLUS every night	Relieve anxiety
03-11-14	NOVAMIX ¹⁰ (30/70) insulin (18-0-18 unit) twice daily	Decreased blood glucose over prolonged period of time.
	OLMIGHTY 20mg once a day	Manage hypertension.
	ISTAMET ¹¹ (50/500) twice a day	Reduce glucose level by ability to restore.
	TRIMETADAY V2 twice a day before meals	Reduce blood glucose absorbed in intestine as predictor to liver.
	SR PEVESCA PLUS twice a day	Relieve anxiety

Alcoholism Therapy

Along with the course of medication for Glaucomatous and diabetes, DISULFIRAM 250 mg was given at night and LIBRIUM 10mg for 10 days to treat against alcoholism since 14/09/2011.

DISCUSSION AND SUMMARY

Type 2 Diabetes mellitus (T2DM) usually illustrated as hyperglycemia^[12], insulin resistance and insulin deficiency.^[13] Risk factors include genetic, obesity, environmental factors which develop into T2DM^[14] and produces long and short tenure complications.^[15] T2DM also have been found linked with hypertension^[16] and elevated alcohol intake.^[17] Regular alcohol consumption decreases insulin sensitivity that put forth by showing toxic effect on pancreas or crookedly by increasing adiposity which contribute to develop diabetes.^[18]

Less insulin production in T2DM are concerned with failure of pancreatic beta cells in respond to hyperglycemia^[19]; reduction in glucose transport to liver,

muscle and fat cells^[20]; increase breakdown of fat and increase production of ketone bodies.^[21]

T2DM patients have common problem of fatty liver, cardiovascular disease and hypertension. Excess supply of free fatty acids in liver and other tissues from adipose tissue for fatty acid oxidation mainly causes insulin resistance.^[22]

Reduction in body weight is helpful for controlling blood pressure and risk of cardiovascular disease.^[23] In the current case study, various reports of the patients had suggested that the concrete diagnosis of Type 2 Diabetes mellitus along with the concerned complications having retinopathy identified as glaucomatous. The patient was treated with combination of drugs in order to control hyperglycemia and cure glaucomatous. Since the patients had habits of taking alcohol regularly, he was also treated with anti-alcoholic drugs. The goal of the entire medication was to reduce the consequence of hyperglycemia and glaucomatous. The treatment strategy

brought the fasting and average plasma glucose near to normal intermittently.

This case revealed that a Diabetic patient along with unusual complications of glaucomatous, fatty liver can develop prostate enlargement which are expected to be seen after several months of T2DM development.

REFERENCE

1. Ngugi MP, Njagi JM, Kibiti CM, Ngeranwa JJ, Njagi EN. Diagnosis of diabetes mellitus. *International Journal of Diabetes Research*. 2012; 1(2): 24-7.
2. Al-Haddad MA, Ibrahim MI, Sulaiman SA, Maarup N. The impact of two diabetes educational programs on patients with diabetes in Malaysia. *Journal of Clinical and Diagnostic Research*. 2009 Aug; 3: 1633-40.
3. Inamdar SZ, Kulkarni RV, Karajgi SR, Manvi FV, Ganachari MS, Kumar BM. Medication Adherence in Diabetes Mellitus: An Overview on Pharmacist Role. *American Journal of Advanced Drug Delivery*. 2013 Aug 30; 1(3): 238-50.
4. Sharma PK, Misra AK, Singh V, Gupta A, Saroha S, Singh S. Cyclophosphamide and epirubicin-induced diabetes mellitus in breast cancer: A rare occurrence. *Journal of Pharmacology & Pharmacotherapeutics*. 2016 Jul; 7(3): 146.
5. Van Genugten RE, Möller-Goede DL, Van Raalte DH, Diamant M. Extra-pancreatic effects of incretin-based therapies: potential benefit for cardiovascular-risk management in type 2 diabetes. *Diabetes, Obesity and Metabolism*. 2013 Jul 1; 15(7): 593-606.
6. Joshi SR. Metformin: Old wine in new bottle-evolving technology and therapy in diabetes. *JAPI*. 2005 Nov 7; 53: 963-72.
7. Shrikrishna B, Mulgund SV, Ranpise NS. Simultaneous spectrophotometric estimation of vildagliptin and metformin in bulk and tablet dosage form. *Der pharma chemica*. 2013; 5(1): 24-7.
8. Yadav PJ, Mohite SK, Magdum CS. Development and validation of analytical methods for simultaneous estimation of voglibose, glimepiride and metformin hydrochloride in bulk and tablet dosage form by hplc. *Ijppr. Human*, 2014; 1(2): 10-21.
9. Rosenstock J, Davies M, Home PD, Larsen J, Koenen C, Schernthaner G. A randomised, 52-week, treat-to-target trial comparing insulin detemir with insulin glargine when administered as add-on to glucose-lowering drugs in insulin-naive people with type 2 diabetes. *Diabetologia*. 2008 Mar 1; 51(3): 408-16.
10. Garber AJ, Wahlen J, Wahl T, Bressler P, Braceras R, Allen E, Jain R. Attainment of glycaemic goals in type 2 diabetes with once-, twice-, or thrice-daily dosing with biphasic insulin aspart 70/30 (The 1-2-3 study). *Diabetes, Obesity and Metabolism*. 2006 Jan 1; 8(1): 58-66.
11. Konari SN, Jacob JT. Stability indicating validated RP-HPLC technique for the analysis of multicomponent anti-diabetic drug combos in pharmaceutical dosage forms. *Karbala International Journal of Modern Science*. 2015 Sep 30; 1(1): 39-48.
12. Taylor R. Type 2 Diabetes. *Diabetes care*. 2013 Apr 1; 36(4): 1047-55.
13. Kohei KA. Pathophysiology of type 2 diabetes and its treatment policy. *JMAJ*. 2010; 53(1): 41-6.
14. Tori Palmberg T. Type 2 Diabetes Research and Analysis Paper: Insight into Effective Treatment in Merced County. *UC Merced Undergraduate Research Journal*. 2014 Jan 1; 6(1).
15. Valliyot B, Sreedharan J, Muttappallymalil J, Valliyot SB. Risk factors of type 2 diabetes mellitus in the rural population of north kerala, india: a case control study. *Diabetologia Croatica*. 2013 Mar 1; 42(1): 33-40.
16. Steyn NP, Mann J, Bennett PH, Temple N, Zimmet P, Tuomilehto J, Lindstrom J, Louheranta A. Diet, nutrition and the prevention of type 2 diabetes. *Public health nutrition*. 2004 Feb 1; 7(1A; SPI): 147-66.
17. Wannamethee SG, Shaper AG, Perry IJ, Alberti KG. Alcohol consumption and the incidence of type II diabetes. *Journal of epidemiology and Community Health*. 2002 Jul 1; 56(7): 542-8. 1.
18. Carlsson S, Hammar N, Grill V, Kaprio J. Alcohol consumption and the incidence of type 2 diabetes. *Diabetes care*. 2003 Oct 1; 26(10): 2785-90.
19. Ratner RE. Type 2 diabetes mellitus: the grand overview. *DIABETIC MEDICINE-CHICHESTER-*. 1998 Dec 1; 15: S4-7.
20. Fujioka K. Pathophysiology of Type 2 Diabetes and the Role of Incretin Hormones and Beta-Cell Dysfunction. *Journal of the American Academy of Physician Assistants*. 2007 Dec 1; 20(12): 3-8. 1.
21. Abdulfatai B. Olokoba, Olusegun A. Obateru, and Lateefat B. Olokoba, Type 2 Diabetes Mellitus: A Review of Current Trends *Oman Med J*. 2012 Jul; 27(4): 269–273. doi: 10.5001/omj.2012.68.
22. Harikrashna B. Bhatt and Robert J. Smith, Fatty liver disease in diabetes mellitus *Hepatobiliary Surg Nutr*. 2015 Apr; 4(2): 101–108. doi: 10.3978/j.issn.2304-3881.2015.01.03.
23. Fan H, Pan Q, Xu Y, Yang X. Exenatide improves type 2 diabetes concomitant with non-alcoholic fatty liver disease. *Arquivos Brasileiros de Endocrinologia & Metabologia*. 2013 Dec; 57(9): 702-8.