Diabetes mellitus, challenges & hopes

Abstract

India, a world capital of diabetes mellitus and Bihar to be considered a first state in the world with 30% population suffering with diabetes mellitus as per 2019 report, a consequent t of changed dietary status, emergence of non nutrients in diet, altered life style and increasing stress, poses a challenge in spite of continuing anti diabetics and insulin supplementation due to increasing insulin resistance, thus an study to evaluate the regime dietary restriction, limited initial diet, modified life style and an adjuvant herbal composite been done.

Material: 3770 diabetic patients attending RA. Hospital & Research Centre, Warisaliganj (Nawada) Bihar and Aarogyam punarjeevan Bihar Patna during Jan 2017 to December 2017 been selected for the study.

Method: Selected patients were interrogated for the history of disease how it is detected, treatment taken and their result, clinically examined and, investigated for diabetic, lipid, haematological, hepatic and renal profile pre and post therapy. Each patients after 10days of restriction, changed life style, limited initial diet, been supplemented with herbal composite Cap META Reg 1 cap 30minutes before breakfast, lunch and dinner. Patients were followed up every 15days for 1year to adjudge the efficacy, safety profile and quality of life.

Result: All patients show marked decline in blood sugar and HbA_{1c}, lipid profile and continuing dose of antidiabetics with complete withdrawal of insulin in 6months of therapy, marked improvement in haematological, hepatic and renal profile. No patients had any blood sugar surge or any consequent sequel during 1 year of follow up with minimal dose of OHA, adjuvant and modified dietary schedule, and life style.

Conclusion: Though growing incidence of diabetes mellitus in India affecting even hard worker, remain a challenge but modified life style, dietary plan and adjuvant Herbal composite remain a hope in control of diabetes mellitus and its sequel to ensure quality life.

Keywords: dietary non nutrient, OHA, herbal composite, limited initial diet, Lipid profile, hepatic, renal, quality of life

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Introduction

As per 2016 WHO survey 422million adults are suffering with diabetes mellitus globally and is increasing rapidly and IDF predicted to be its double by 2030.¹⁻⁸ A disease of luxury today affecting more the persons of low socio economic status and is attributed to trend of urbanization, change in lifestyle, sedentary life, less physical work, changing dietary constituents and emergence of non nutrients in the diet. Presently India had more diabetics than any other country and is considered diabetic capital of the World as 62million Indians i.e.- more than 7.2% of adult population are affected with Diabetes mellitus and nearly 1 million dies of diabetes mellitus every year.⁹ Recent survey reveals 30% population of Bihar is affected with Diabetes mellitus which only represent the registered cases while at least 10 % cases remain unregistered and taking vague treatment or treated by non qualified doctors. Due to rampant use of fertilisers chemical insecticide and soil engerisers the food and drinks constitute a non nutrient constituent due to changed soil texture and chemical status which causes various metabolic and endocrinal disorders and these days also a cause of carcinogenesis due to increased proliferation and decreased apoptosis.¹⁰ In past patients with blood sugar more than 400mg % remain unable to stand or present with hyperglycaemic coma but these days patients even with blood sugar more than 500mg

remain standing and dictate the disease history which affirms the changed etiopathogenesis of diabetes mellitus i.e. combined effect of hepato pancreatic dysfunction as evidence by its incidence and changed hepatic profile in majority cases.¹¹ Study approves the initial dietary dose effect on the prognosis of diabetes mellitus as 100 calories initial diet improves the quality of life and diabetic control.¹²

Material & method

Material:

3770 patients of diabetes mellitus enrolled at RA Hospital & Research Centre Warisaliganj (Nawada) Bihar and Aarogyam Punarjeevan, Ram Bhawan, Ara Garden Road, Jagdeopath, Baily Road Patna 14 were considered for the proposed study.

Methods:

Enrolled patients were interrogated thoroughly for their disease history, treatment taken, their response, clinically examined and investigated for Fasting blood sugar, post prandial blood sugar, HbA_{1c}, lipid profile, hepatic profile and renal profile. For ease of evaluation urine was also assessed for sugar and albumin. Old patients were continued with continuing therapeutics with suggestive care while newly detected cases were advised as per their glycaemic status

- Restriction of carbohydrate (Rice, potato, sugar strictly)
- Initial diet not more than 100calories
- Total calorific requirement as per need
- Adjuvant herbal therapeutics META Reg 1 cap 30minutes before breakfast, lunch and dinner
- In new cases after 4weeks, patients were re evaluated for diabetic parameters and patients having fasting blood sugar >250mg% was advised Oral hypoglycaemic agent with vigil watch on blood sugar or any manifestation of hypoglycaemia.
- In old cases with adjuvant, continuing therapeutic dose been tapered down on any evident manifestation of hypoglycaemia.

Patients of either group been given a follow up card to enter hypoglycaemic event or any other sequel, on hypoglycaemic manifestation patients are warned to take sugar candy and taper the dose of continuing Insulin dose by 25% and visit the centre for evaluation or contact the project in charge for evaluation.

Each Cap of Meta Reg constitutes active ingredient of:

Each capsule of 500mg constituents	
Ficus bengalensis (Bad ka chhal)	90mg
Gymnema sylvestre (Gudmar)	40mg
Syzgium cumini (Jamun)	40mg
Coccinia grandis (Kundru)	40mg
Tribulus terrestris (Bada gokshuru)	40mg
Calotropis gigantea (Ark root)	20mg

Opuntia dilenii (Thhuhar)	4mg
Picrorhiza kuroo(Kutki)	20mg
Terminalia arjuna (Arjun)	40mg
Sida rhombifolia (Mahavala)	40mg
Momordica charantia (Karela)	40mg
Rubia cordifolia (Manjishtha)	40mg
Aegle marmelos (Vel patra)	20mg
Tigonella foenum graecum (Methi seed)	6mg

During each visit diabetic, lipid, renal and hepatic profile been repeated to adjudge the response of therapeutics, diet and life style changes, in addition safety profile.

Observation

Among the 3770 selected patients , 2250 and 1520 were male and female respectively of age group 22-52years while among them 2520 were old diabetics taking various i.e. Insulin, OHA and OHA combination (Table 1, Figures 1–3) Out of all old cases 1230patients were having no diabetic sequel while 545, 540 and 205 patients were with associated hypertension, neuropathy and nephropathy respectively (Figure 4) 322 old and 120 new cases were with fasting blood sugar 130-150mg% though 220 old and 34 new cases had fasting blood sugar >290mg% while post prandial blood sugar in 264 old and 780 new cases were with 200-250mg% though 119 old and 18 new cases were with >500mg%. HbA_{1c} was 7-9 in 428 old and 156 new cases while >13in 361 old and 119 new cases (Table 2). Out of all 245 old and 10 new cases had haemoglobin <10gm% 2094 old and 80 new cases were with altered hepatic function while 205 and 165 old cases were with altered renal and lipid profile respectively (Table 3).

Figure 1 Bar diagram showing distribution as per sex.

Figure 2 Pie diagram showing distribution of patients as per their treatment status.

Figure 3 Bar diagram showing distribution as per consumed therapeutics.

Figure 4 Distribution of patients as per their disease status.

Keywords: Non complicated diabetes mellitus, A; Diabetes with hypertension, B; Diabetes with Neuropathy, C; Diabetes with Nephropathy, D.

Figure 5 Graph showing pattern of blood glucose and lipid status of the patients.

Table 1 Distribution of patients as per age and sex

Age group	Number of patients	
	Male	Female
22-27	130	80
27-32	260	120
32-37	480	210
37-42	490	250
42-47	520	390
47-52	370	470

Table 2 Showing Diabetic profile of the patients on admission

Parameters	Number of patients					
	Old patients			New patients		
	Male	Female	Total	Male	Female	Total
HbA _{1c} :						
7-9	210	218	428	98	58	156
9-11	640	310	950	250	260	510
11-13	511	270	781	236	229	465
>13	245	116	361	60	59	119
Blood sugar(mg%):						
Fasting:						
130-150	213	109	322	60	60	120
150-170	196	132	328	102	110	212
170-190	243	108	351	114	129	243
190-210	132	72	204	80	70	150
210-230	149	69	218	72	60	132
230-250	280	138	418	64	52	116
250-270	120	86	206	76	60	136
270-290	129	124	253	54	53	107
>290	144	76	220	22	12	34
Post prandial:						
200-250	176	88	264	38	40	78
250-300	332	249	581	162	134	296
300-350	310	188	498	148	144	292
350-400	295	105	400	134	130	264
400-450	248	168	416	102	49	151
450-500	160	82	242	48	53	101
>500	85	34	119	12	6	18

Table 3 Distribution of patients as per basic bio parameters

Parameters	Number of patients					
	Old patients			New patients		
	Male	Female	Total	Male	Female	Total
Haematological:						
Haemoglobin:						
< 10 gm %	156	89	245	6	4	10
>10 gm %	1450	825	2275	638	602	1240
Hepatic profile:						
Serum bilirubin ;						
<1mg%	320	106	426	600	570	1170
>1mg%	1286	808	2094	44	36	80
SGOT:						
<30 IU	320	106	426	440	210	650
>30 IU	1286	808	2094	204	396	600
SGPT:						
<30 IU	320	106	426	440	210	650
>30 IU	1286	808	2094	204	296	600
Renal profile:						
Serum creatinine						
<1.5 mg	1450	865	2315	639	599	1238
>1.5 mg	156	49	205	5	7	12
Blood Urea						
<26mg	1450	865	2315	639	599	1238
>26mg	156	49	205	5	7	12
Urine:						
Albumin						
Present	156	49	205	3	2	5
Absent	1450	865	2315	641	604	1245
RBC						
Absent	1450	865	2315	641	604	1245
Present	156	49	205	3	2	5
Lipid profile:						
Total Serum Cholesterol						
<200mg	1246	749	1995	629	576	1205
>200mg	360	165	525	15	30	45

Result

All patients of both group show progressive decline in fasting and post prandial blood sugar HbA_1C and lipid profile and attains normoglycemic state by 6th month of therapy (Table 4&5, Figure 6–8). In addition all old cases on Insulin shows progressive decline in insulin dose and completely withdrawn by 6th month of therapy (Figure 9), in addition all cases also had decline in OHA dose with complete normalisation of haematological, hepatic and renal profile with improved quality of life. No patients had any withdrawal presentation (Table 6).

Table 4 Outcome of the study

Bio parameters	Number of patients	
	Old cases	New cases
BLOOD SUGAR (mg%)		
Fasting :		
80-100	2230	980
100-120	290	270
120-140	Non	Non
>140	Non	Non
Post prandial		
140—150	2190	1160
150- -160	330	90
160-170	Non	Non
170-180	Non	Non
180-200	Non	Non
>200	Non	Non
LIPID PROFILE (mg%)		
Serum Cholestrol :		
150-170	225	131
170-190	2170	1060
190-210	125	59
>210	Non	Non
RENAL PROFILE		
Blood Urea :		
<26mg%	2520	1250
>26mg%		
Serum creatine		
<1.5mg%	2520	1250
>1.5mg%	Non	Non
Urine :		
Albumin		
Present :	Non	Non
Absent :	2520	1250

Table continued

Bio parameters	Number of patients	
	Old cases	New cases
RBC:		
Present	Non	Non
Absent	2520	1250
HEPATIC PROFILE		
SGOT:		
<30 IU	2520	1250
>30IU	Non	Non
SGPT:		
<30 IU	2520	1250
>30 IU	Non	Non
Alkaline phosphatase :		
<140		
>140	Non	Non

Table 5 Showing pattern of HbA_1C

HbA1C	Number of patients					
	1 st	2 nd	3 rd	4 th	5 th	6 th
>13	480	56	45	38	12	0
11-13	1246	944	870	620	324	0
9-11	1460	1010	960	540	402	0
7-9	984	903	395	890	1120	0
5-7	0	655	1020	1012	884	330
3-5	0	202	480	670	1028	3440

Table 6 No patients had any withdrawal presentation

Response in clinical presentation improvement:	
Particulars	Remarks
Diabetic triad:	None
Hypertension	
Completely controlled	All
Neuropathic manifestation	
Tingling numbness	None
Burning hand & feet	None
Pain in extremity	None
Nephrological manifestation	
Polyuria	None
Oliguria	None
Swelling of the body	None
Puffiness of face	None
Exertional dyspnoea	None
Obesity	None

Figure 6 Graph showing decline in continuing antidiabetics in old cases.

Figure 7 Graph showing achievement of normoglycemic state in both old and new cases.

Figure 8 Schematic presentation of Effect of low caloric diet on GLP and GIP secretion.

Figure 9 Schematic presentation of GLP and GIP effect.

Figure 10 Schematic presentation of Herbal composite effect.

Discussion

Increasing incidence of diabetes mellitus among Indian due to changed life style, dietary habits, emergence of non nutrient in dietary products and economical burden induced stress, designated India as World capital of Diabetes. In addition current survey of 2019 more than 30% Bihar population is affected with Diabetes mellitus.¹⁻⁴ Increasing tolerance to high blood sugar created doubt of multifocal pathogenesis of hyperglycaemia and been approved as hepatopancreatic etiopathogenesis. In spite of increasing incidence and its sequel even with OHA and Insulin supplementation,¹³⁻¹⁹ pose a challenge to healthy longevity, but in present study with modified life style, 100 calories initial diet, restriction of fast food and unconscious eating with supplementation of herbal composite Cap META Reg in 3770 patients shows marked decline in blood sugar, serum lipid, HbA1C. Progressive decline in Insulin supplementation achieving complete withdrawal of Insulin and declined OHA dose with normoglycemic status in 6 months therapy with better quality of life without any adversity and reversal of lipid, hepatic, and renal profile. This marked clinical efficacy can be explained as – Minimal initial diet prompt secretion of incretin (GLP), and GIP which induce Insulin secretion from Pancreatic Beta Cells, restricted dietary allowance and food grain rice and potato decreases amount of non nutrient enzyme inhibitor (Figures 8&9) while constituent of META Reg²⁰ – *Gymnema sylvestre*, *Sygium cumini*, *Coccinia grandis*, and *Trigonella foenum-graceum* invigorate Pancreatic Beta cells to synthesize Insulin, *Ficus bengalensis*, *Tribulus terrestris*, *Calotropis gigantea*, and *Picrorhiza kurroo* modulate hepatic parenchyma to increase glucose utilization and glycogenesis *Terminalia arjuna* and *Sida rhombifolia* modulate lipid metabolism and helps decline raised lipid profile, increase cardiac blood supply and its tonicity, thus takes care of cardiac healthy state. *Momordica charantia*, and *Rubia cordifolia* increases insulin receptor sensitivity, *Aegle marmelos* decline absorption of carbohydrate and lipid from intestine while *Opuntia delleni* modulate neuro endocrinal path way for needed insulin release (Figure 10). Thus this combo prescription ensure diabetic control with improved quality of life.

Conclusion

Though diabetic incidence is increasing in geometric progression and failure of existing modern molecule, change in life style, dietary intake and its regime, moderate exercise and Cap META Reg in dose of 1 cap 30 minutes before breakfast, lunch and dinner, a new hope for diabetic control and better control of quality of life.

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Conflicts of interest

The author declares that there is conflict of interest.

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