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Research Article

A Prospective And Observational Study On Diabetes Mellitus And Hypertension Patients In Tiruvannamalai.

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ABSTRACT

The Aim Of The Present Study Was To Conduct A Prospective Observational Study The Patients With Diabetes Mellitus And Hypertension With Or Without Comorbidities In Tiruvannamalai. The Study Was Performed With 651 Patients, Visiting Bala's Star Hospital, For A Period Of 20 Months From August 2018-March 2020. The Subjects Completed An Interviewer- Administered Questionnaire. The Questionnaire Included Variables, Such As Sociodemographic Factors, Laboratory Findings And Drug Use Pattern For Diabetes Mellitus And Hypertension Patients. The Study Revealed That A High Proportion Of Factors, Like Obesity, Family History Of Diabetes, Dyslipidemia, Uncontrolled Glycaemic Status, Sedentary Lifestyles Were Prevalent In Diabetes And Hypertension Patients, Combination Therapy Was Observed In A High Percentage Of Prescriptions Compared With Monotherapy.

Key Words; Type Of Diabetes Mellitus , Physical Activity, BMI, Laboratory Variables, And Prescription Pattern

INTRODUCTION

India Is Experiencing A Rapid Increase In Non-Communicable Diseases (Ncds) While Still Grappling With A High Burden Of Infectious Diseases And Maternal And Child Health Conditions [1]. Diabetes Mellitus (DM) Is A Chronic Disease Characterized By Metabolic Disorder And Hyperglycemia. Globally, DM Is The Most Common Non-Communicable Disease And One Of The Main Threats To Human Health [2].Primarily Due To Micro And Macrovascular Complications [3]. Huge Increments In Diabetes Prevalence Have Been Seen Throughout The World, With A Current Estimation Of 463 Million People Worldwide. The Global Prevalence Of People With Diabetes Is Expected To Increase From The Current Estimate Of 463 Million To 578 Million In 2030 And 700 Million In 2045 [4]. Depending On The Etiology Of The DM, Factors Contributing To Hyperglycemia Include Reduced Insulin Secretion, Decreased Glucose Use, And Increased Glucose Production [5]. High Blood Pressure (BP) Is Ranked As The Third Most Important Risk Factor For Attributable Burden Of Disease In South Asia (2010). Hypertension (HTN) Exerts A Substantial Public Health Burden On Cardiovascular Health Status And Healthcare Systems In India. HTN Is Directly Responsible For 57% Of All Stroke Deaths And 24% Of All Coronary Heart Disease (CHD) Deaths In India. The WHO Rates HTN As One Of The Most Important Causes Of Premature Death Worldwide. The Global And Regional Burden Of Disease And Risk Factors Study (2001), In A Systematic Analysis Of Population Health Data For Attributable Deaths And Disease Burden, Has Ranked HTN As Second In South Asia. In An Analysis Of Worldwide Data For The Global Burden Of HTN, 20.6% Of Indian Men And 20.9% Of Indian Women Were Suffering From HTN In 2005. The Rates For HTN In Percentage Are Projected To Go Up To 22.9 And 23.6 For Indian Men And Women, Respectively By 2025. Recent Studies From India Have Shown The Prevalence Of HTN To Be 25% In Urban And 10% In Rural People In India. According To The WHO 2008 Estimates, The Prevalence Of Raised BP In Indians Was 32.5% (33.2% In Men And 31.7% In Women). However, Only About 25.6% Of Treated Patients Had Their BP Under Control, In A Multicenter Study From India On Awareness, Treatment, And Adequacy Of Control Of HTN [6]. In 2011,World Health Organization (WHO) Member States Signed The Global Action Plan For The Prevention And Control Of Non-Communicable Diseases, Which Aimed To Halt The Rise Of Diabetes By 2025 And Reduce The Prevalence Of Hypertension By 25% Between 2010 And 2025. In 2015, As Part Of Sustainable Development Goal, The United Nations (UN) Member States Set The Target Of Reducing Premature Mortality From Non Communicable Diseases (Ncds) By One-Third By 2030. Given India's Huge Population, Its Achievements Are Critical To Reaching These Global Targets. India Is In The Midst Of A Rapid Epidemiological Transition: The Estimated Proportion Of Disability-Adjusted Life-Years (Dalys) Attributable To Ncds In India Has Risen From

31% Of Total Daly's In1990 To 55% In 2016. An Increasing Prevalence Of Diabetes And Hypertension Is Thought To Be Both An Important Driver And Consequence Of This Transition [7]. Although We Know That The Prevalence Of Raised Blood Glucose And BP Among Adults In India Is High At 7.5 And 25.3%, Respectively, Little Is Known About The Degree To Which These Conditions Overlap, And How This Comorbidity Is Related To Other CVD Risk Factors – Such As Obesity – And Sociodemographic Characteristics. This Knowledge Of Concurrently Raised Blood Glucose And BP, However, Is Essential To Build An Effective Public Health And Health Services Response To The Rise Of CVD In India [8].
People With Diabetes And Hypertension Have More Outpatient Department Visits, And Require More Long-Term Care. Assessing The Prevalence Of Diabetes And Hypertension Complications Is Important To Take Necessary Measures Like Preparing Preventive And Treatment Strategies To Minimize The Impact Of The Complications. The Identification Of The Prevalence Of Diabetes And Hypertension Complications And Factors Contributing To Its Occurrence Are Also Important For The Modification Of Practices And Policies In The Management Of The Disease. Thus, It Is Imperative To Study About Diabetes And Hypertension Complications And Its Associated Factors From Time To Time In Order To Detect The Changing Trends To Plan Out The Course Of Action. However, There Was No Study Conducted On Demographic And Prescription Pattern Analysis Related To Diabetes And Hypertension Complications And Associated Factors In Tiruvannamalai. Therefore, This Study Aimed To Determine Prescription Pattern Of Diabetes And Hypertension And Its Complications And Contributing Factors.

The Aim Of The Study Is To Analyze The Prescription Pattern Of Anti-Diabetic And Anti-Hypertensive Drugs And Its Combination Therapy In Patients With Diabetes Mellitus And Hypertension With Or Without Comorbidities In Tiruvannamalai. The Following Are The Objectives Of The Studies I.E., To Analyse The Demographic Information Of The Enrolled Patients, Analyse The Laboratory Variables In Patients Diagnosed With Diabetes And Hypertension, To Analyse The Patterns Of Use Of Major Pharmaceutical Drug Classes Given For Diabetes And Hypertension And Their Co Morbidities.

The Need For The Present Study Is To Investigate Whether Prescription Analysis Helps To Improve The Rational Use Of Drugs. It Helps In Knowing The Errors And Improper Prescribing, Major Problem Identified In Hospitals These Days. It Also Helps Us To Provide Advantageous Feedback To Prescribers In Order To Improve Their Prescribing Behaviour. We Planned To Carry Out The Study In Diabetic And Hypertension Patients With Focus On Outlook Of "How The Anti-Diabetic And Anti Hypertensive Drugs Are Being Prescribed" Which Helps In Understanding Various Factors Such As Over And Under Consumption Of Drugs. With Increase In Prevalence Of Diabetes, Hypertension, And There Associated Complications And Co-Morbidities Which Leads To Increase In The Number Of Drugs In The Prescription Which In Turn Leads To Irrational Drug Use Pattern [9].

Materials And Methods

Study Design

A Prospective Observational Study Is Conducted In The Outpatients Visiting Bala's Star Hospital, Tiruvannamalai.

Study Population

The Study Group Consists Of 651 Patients, Both Male And Female Diagnosed With Diabetes And Hypertension With Their Co-Morbidities, Visiting Bala's Star Hospital, Tiruvannamalai.

Study Duration

The Study Was Carried Out For 20 Months From August 2018-March 2020.

Study Site Bala's Star Hospital, Tiruvannamalai, Tamilnadu, India.

Source Of Data

All The Relevant And Necessary Data For The Study Was Collected From The Patient Profile Forms, Patient Medication Charts, Laboratory Test Reports And Interviewing Patients And Health Care Professionals In A Form That Is Suitable For The Study.

Study Procedure

The Study Teams Visits The Study Site On Regular Basis And Selects The Patients According To The Study Criteria, Then Take The Verbal Consent From Patient, The Necessary Data Is Collected From The Patient And Their Patient Profile Forms And Medication Chart, Laboratory Report In A Designed Data Collection Form. The Present Research Was Ethically Approved By The Institutional Human Ethics Committee Of The University (Ref. No- IHEC/526/2019).

Selection Of Subjects

The Patients Or The Subjects Were Selected Or Taken Into This Study According To The Following Inclusion And Exclusion Criteria

Inclusion Criteria

- Patients Of Both Gender Were Included In The Study.
- Patients Diagnosed With Diabetes Mellitus And Hypertension.
- Patients With Diabetes Mellitus And Hypertension Along With Other Co-Morbidities Were Selected.

Exclusion Criteria:

- Patients Without Diabetes Mellitus Hypertension And Other Ambulatory Conditions Such As Poisoning And Accident Cases Were Excluded From Study.
- Pediatric Patients Were Also Excluded From Study.
- Patients With Gestational Diabetes Are Also Excluded From Study.
- Patient Who Are Not Willing To Participate In The Study Are Excluded [10,11].

Table 1: Demographic And Laboratory Variables

S.No	Demographic & Laboratory Test	Variables	No. Of. Patients	% Percentage
1.	Age	20-40	114	17.51
		41-60	363	55.76
		61-80	165	25.34
		Above 80	9	1.38
2.	Sex	Male	349	53.60
		Female	302	46.39
3.	Type Of Diabetes Mellitus	Type I	28	4.30
		Type II	623	95.69
4.	Duration Of Diabetes	0-5 Years	186	47.0
		6-10years	85	21.5
		11-20 Years	95	24.0
		Above 20 Years	29	7.34
5.	Duration Of Hypertension	0-5 Years	104	40.6
		6-10years	76	29.6
		11-20 Years	44	17.2
		Above 20 Years	32	12.5
6.	Physical Activity (Exercise)	Yes	157	24.11
		No	494	75.88
7.	Family History	Diabetes	112	17.20
		Hypertension	184	28.26
		Diabetes With Hypertension	234	35.94
		None Of These	121	18.6
8.	BMI	Underweight	30	4.6
		Normal	72	11.05
		Overweight	258	39.6
		Obese	291	44.7
9.	Smoking	Non-Smokers	362	55.6
		Smokers	289	44.3
10.	Alcohol	Non- Alcoholics	421	64.7
		Alcoholics	230	35.3
11.	FBS	110-150	237	36.4
		151-200	262	40.2
		Above 201	152	23.3
12.	PPBS	140-200	154	23.7
		201-300	382	58.7
		Above 300	115	17.6
13.	Hba1c	Below 6.5	6	2.98
		6.6-8.5	126	62.68
		8.6-10.5	63	31.34
		Above 10.6	6	2.98

14.	Systolic BP	120-139mm Hg	371	56.98
		140-159 Mmhg	238	36.55
		Above 160mm Hg	42	6.45
15.	Diastolic BP (Mm/Hg)	80-90 Mm Hg	380	58.37
		90-99 Mm Hg	235	36.09
		Above 100mm Hg	36	5.52
16.	HDL	Below 35	16	3.80
		35-60	404	96.19
		Above 60	0	0
17.	LDL	Below 150	380	85.97
		Above 150	62	14.02
18.	VLDL	10-40	247	85.46
		40-50	27	9.34
		Above 50	15	5.19
19.	Triglycerides	55-190	370	83.71
		190-220	30	6.78
		Above 220	42	9.50
20.	Total Cholesterol	Below 140	62	14.31
		141-200	216	49.88
		201-240	115	26.85
		Above 240	40	9.23
21.	Sr. Creatinine	Below 0.5	5	2.56
		Above 1.2	190	97.43
22.	Sr.Urea	Below 10	0	0
		Above 50	180	100
23.	Sr.Uric Acid	Below 3.4	4	18.18
		Above 7	18	81.81
24.	Complication	Neuropathy	96	14.74
		Retinopathy	21	3.22
		Nephropathy	19	2.91
		Foot Ulcer	41	6.29
		Polyuria	15	2.30
		Nocturia	11	1.68
		Polydipsia	28	4.30
		Weakness	39	5.91
		Itching Of Private Parts	17	2.60
		Numbness	36	5.50
		Burning Micturation	23	3.50
		Vision Impairment	35	5.30
		Skin Complaint	18	2.76
		Muscle Spasm	27	4.14
		Constipation	25	3.80
		No Complication	200	30.72
25	Co-Morbiditis	Thyroid	8	1.22
		Peptic Ulcer	91	13.97
		Iron Deficiency Anaemia	31	4.76
		Osteoporosis & Rheumatoid Arthritis	27	4.14
		Cardiovascular Diseases	32	4.91
		Asthma	7	1.07
		Stroke	4	0.61

Table 2: Drug Prescribing Pattern Involved With Anti-Diabetics And Anti-Hypertensives.

S.No	**Category**	**Therapy**	**Drugs**	**No's**	%	**Total No's (%)**
1	Anti Hypertensive	Single Therapy	Telmisartan	69	10.59	(184) 28.3%
			Torasemide	9	1.38	
			Metoprolol	14	2.15	
			Heparin	8	1.22	
			Atorvastatin	48	7.37	
			Amlodipine	14	2.15	
			Atenolol	2	0.3	
			Rosuvastatin	2	0.3	
			Benidipine Hydrochloride	2	0.3	
			Clinidipine	10	1.53	
			Carvedilol	4	0.6	
			Trimetazidine	2	0.3	
		Doublet Therapy	Telmisartan+ Chlorthalidone	18	2.76	32 (4.9%)
			Rosuvastatin + Fenofibrate	2	0.3	
			Cilnidipine + Telmisartan	8	1.22	
			Rosuvastatin + Ezetimibe	2	0.3	
			Spironolactone + Torasemide	2	0.3	
		Triplet Therapy	Telmisartan+ Amlodipine + Hydrochlorothiazide	13	1.99	40 (6.14%)
			Olmesartan + Amlodipine+ Hydrochlorothiazide	2	0.3	
			Rosuvastatin + Aspirin + Clopidogrel	12	1.84	
			Cilnidipine + Telmisartan+ Chlorthalidone	2	0.3	
			Atorvastatin + Aspirin + Clopidogrel	11	1.68	
	Antidiabetics	Single Therapy	Metformin	24	3.68	125 (19.2)
			Gliclazide	14	2.15	
			Glimepiride	8	1.22	
			Pioglitazone	11	1.68	
			Repaglinide	2	0.3	
			Vildagliptin	38	5.83	
			Acarbose	2	0.3	
			Voglibose	4	0.6	
			Human Insulin	7	1.07	
			Insulin Isophane	15	2.30	
		Doublet Therapy	Metformin+Glimepiride	30	4.60	151 (23.19)
			Gliclazide + Metformin	18	2.76	
			Repaglinide +Metformin	3	0.46	
			Voglibose +Metformin	56	8.60	
			Metformin +Teneligliptin	28	4.30	
			Vildagliptin + Metformin	8	1.23	
			Sitagliptin + Metformin	2	0.3	
			Insulin Isophane + Human Insulin	6	2.4	
		Triplet Therapy	Voglibose + Metformin +Glimepiride	119	18.27	119 (18.27)

Results

The Study Was Conducted Among The Outpatients Of Bala's Star Hospital, Tiruvannamalai. For A Period Of 20 Months. The Total Number Of Cases Collected Was 651. The Patients Were Assessed For Their Demographic Details, Like Age, Sex, Type Of Diabetes Mellitus , Duration Of Diabetes, Duration Of Hypertension, Physical

Activity, Past Medical History, BMI, Risk Factors, Laboratory Variables, And Complications, Co-Morbities Of Diabetes Mellitus And Hypertension As Mentioned In Table-1.

Socio Demographic Characteristics

Age Wise Distribution: Among 651 Patients Of Study Population With Age Group Ranging Between 20 To 90 Years, Majority Were Of Age Group 41 To 60 Years (N-363,55.76%),61-80 Years, (N-165,25.34%),20 To 40 (N-114,17.51%) And The Least Were In The Age Group Of Above 80 (N-9,1.38%) (Table 3).

Gender Wise Distribution: Among The Study Samples (N-651), 349 (53.60%) Were Male, And 302 (46.39%) Were Female.

Categorization Of Diabetes Mellitus

Among 651 Patients In The Study Population, Type 2 DM Is The Common Type Of Diabetes Mellitus, It Accounts For 95.69% (N-623) Of Patients, Whereas Type 1 Was Not Commonly Found And Accounts For Only 4.30% (N-28) Of Total Cases Collected (Table 1).

Physical Activity: According To The Study, Among 651 Patients 494(75.88%) Of Patients Had No Form Of Physical Activity, 157 (24.11%) Patients Were Doing Regular Exercise (Table 4).

Family History: As We Know Genetic Factors Play An Important Role In Causing Diabetes Mellitus And Hypertension, Among 651 Patients 112(17.20%) Patients Have A Family History Of DM,184(28.26%) Patients Have A Family History Of Hypertension,234(35.94%) Have The Family History Of Both Diabetes Mellitus And Hypertension, 121(18.60%) Patients Did Not Have The Family History Of Diabetes Mellitus And Hypertension.

BMI Range: We Have Analyzed The BMI Values Of The Patients In Our Study And Noticed That, Only 72 Patient (11.05%) Had Normal Weight; The Majority Was Either Overweight 258(39.60%) Or Obese 291(44.70%) These Patients Are At Major Risk Of Non-Communicable Disease And Few Were In Underweight Category 30(4.60%) (Table 6).

Range Of Hba1c Levels In Patients: Hba1c Provides A Longer Term Trend For A Period Of 90 Days, Similar To An Average Of How High Blood Sugar Levels Have Been Over A Period Of Time, In The Study Majority Of The Population Had Hba1c Ranging Between 6.6-8.5 That Is 126 (62.68%),63 (31.34%) Has The Range Between 8.6-10.5,Few The Range Between Below 6.5 Only 6(2.98%)Above 10.5 Only 6(2.98%) And(Table 7).

Blood Glucose Levels: During The Study Period, Regular Monitoring Of The Blood Glucose Levels Was Done, Fasting Blood Sugar Level In The Range Of 110-150, 237 Patients Of 36.40%,In The Range Of 151-200(N-262,40.20%),Above 201 Range (N-152,23.30%) Where As In The Postprandial Blood Sugar Level The Glycemic Range Of 140-200 (N-152 ,23.70%),Majority In The Range Of 201-300 (N-382,58.70%),Above 300 (N-115,17.60%) (Table 8).

Behavioural Profile

The Findings Of The Study Showed That 44.30% (N-289) And 35.30% (N-230) Smokers And Alcoholics Were Found To Have Diabetic And Hypertension Complications. The Number Of Diabetic And Hypertension Complications In Non-Alcoholics And Non-Smokers Was High (55.60% (N-362) And 64.7% (N-421)) Respectively.

Blood Pressure Levels

We Have Analyzed The Blood Pressure Level For 651 Patients In Our Study And Noticed The Systolic Blood Pressure Of Majority Patients Fall In The Range Of 120-139 (N-371,56.98%),140-159 (N-238,36.55%) Were Few In The Range Above 160 (N-42,6.45%). Where As In Diastolic Blood Pressure Most Of The Patients Fall In The Range Of 80-90 (N-380,58.37%),90-99 (N-235,36.09%) Were Few In The Range Above 100 (N-36,5.52%).

Dyslipidemia

The Number Of Complications Found In Diabetic And Hypertension Patients With Dyslipidemia Were As The Total Cholesterol Level For Most Of The Patients Were In The Range Of 141-200 (N-216,49.88%),201-240(N-115,26.85%), Below 140(N-62,14.30%),Above 240 (N-40,9.23%),Triglycerides 55-190 (N-370,8371%),190-220(N-30,6.78%),Above 220(N-42,9.50%), HDL35-60 (N-404,96.19%),Below 35 (N-16,3.80%),VLDL10-40(N-247,85.46%),40-50(N-27,9.34%),Above 50 (N-15,5.19%) And LDL Below 150 (N-380,85.97%) ,Above 150 (N-62,14.02%). Diabetic Complications Were Found To Be Associated Significantly With Altered Lipid Profile Therefore Proving To Be A Risk Factor.

Complications In Diabetic And Hypertension

The Subjects Had Classic Diabetic And Hypertension Complications. Of The 651 Subjects, 96 (14.74%)Neuropathy, Retinopathy 21 (3.22%), Nephropathy 19 (2.91%), Foot Ulcer 41 (6.29%), Polyurea 15(2.30%), Nocturia11 (1.68%), Polydipsia 28 (4.30%), Weakness 39 (5.91%), Itching 17(2.60%), Numbness

36(5.50%), Burning Micturation 23(3.50%), Vision Impairment35 (5.30%), Skin Complaint 18 (2.76%), Muscle Spasm 27 (4.14%),Stroke 4 (0.61%), Constipation 25 (3.80%) And Remain 30.72% Does Not Have Any Reported Compliance.

Co-Morbiditis In Diabetic And Hypertension

Diabetes And Hypertensive Patients Are Associated With Various Comorbiditis In Diseases State Most Of Them Affected By Peptic Ulcer 91 (13.97%)Followed By Cardiovascular Diseases 32 (4.91%),Anaemia 31(4.76%),Arthritis 27 (4.14%),Thyroid 8(1.22%) And Asthma 7 (1.07%).

Prescribing Pattern Of Anti-Diabetic Drugs

Oral Hypoglycaemic Therapy: Oral Hypoglycaemic Drugs Are Most Commonly Used In The Patients As Most Of Them Are Affected With Type2 Diabetic Mellitus. In Connection With Anti Diabetic Drug Treatment Protocol The Standard Dose Of Vildagliptin Is The Mostly Used Drug In Singlet Therapy Of 5.83% Followed By Metformin 3.68%,Insulin Isophane 2.30% Gliclazide 2.15%, Pioglitazone 1.68%, Glimepride 1.22%, Human Insulin 1.07%, Voglibose 0.6%, Acarbose And Repaglinide 0.3%. Where As In Doublet Therapy Voglibose With Metformin 8.60%,Followed By Metformin With Glimepride 4.60% , Metformin With Teneligliptin 4.30%, Metformin With Gliclazide 2.76%, Human Insulin With Insulin Isophane 2.40%,Vildagliptin With Metformin 1.23%, And Repaglinide With Metformin 0.46% Are Used But In Triplet Therapy Voglibose With Metformin And Glimepride Is Most Used Drug For Diabetic Patients Of 18.27%. (Table 2).

Prescribing Pattern Of Anti-Hypertension Drug Therapy

In Connection With Antihypertensive Drug Treatment Protocol Telmisartan Is Mostly Used Drug For About 10.59% In Singlet Therapy Followed By Atorvastatin 7.37%,Metoprolol Succinate And Amlodipine 2.15%, Clinidipine 1.53% Torasemide 1.38% Heparin 1.22%, Carvedilol 0.6% And Atenolol, Rosuvastatin , Benidipine Hcl,Trimetazidine Of 0.3% Were Used. While On Doublet Therapy Telmisartan With Chlorthalidone Is Widely Used For About 2.76% Followed By Cilnidipine With Telmisartan 1.22% And Others Like Spironolactone With Torasemide, Rosuvastatin With Ezetimibe, Rosuvastatin With Fenofibrate Is Used For 0.3%. While On Triplet Therapy Telmisartan, Amlodipine With Hydrochlorothiazide Is Mostly Used For About 1.99% Followed By Rosuvastatin , Aspirin With Clopidogrel 1.84%, Atorvastatin, Aspirin With Clopidogrel 1.68%, Olmesartan, Amlodipine With Hydrochlorothiazide, And Cilnidipine, Telmisartan With Chlorthalidone Is Used For 0.3% (Table 2).

Discussion

Diabetes Mellitus Is A Chronic Disease Characterised By Insulin Resistance, Impaired Insulin Secretion, And Hyperglycaemia. It Is The Most Prevalent Metabolic Condition Associated With The Major Health And Socioeconomic Problems Worldwide [10, 11]. Diabetes-Related Complications May Result In Many Disabilities Which Cause A Reduction Of Patients' Quality Of Life And Increase The Burden On The Healthcare System [12]. Early Detection And Adequate Control Remain The Key Focus In Diabetes Management. Several Studies Have Shown That Diabetes Control Worsens With Increase In The Duration Of The Disease [13]. Poor Glycemic Control Remains As One Of The Risk Factors Resulting In The Development Of Micro And Macrovascular Complications. Therefore, It Becomes Imperative For Both The Patients And Physicians In Regulating The Proper Glycemic Control [14]. In Addition To Achieving The Glycemic Control Goal, Managing Factors Like Blood Pressure Can Prevent Or Delay The Onset Of Diabetes Complications Among People With Diabetes [15].Untreated Diabetes May Result In Limb Amputation, Blindness, Kidney Failure And Neuropathy. It Is Also Associated With 4fold Increase In Risk Of Cardiovascular Events. Drug Use Pattern Studies Is An Essential Tool For The Medical Audit That Is Usually Used To Monitor, Evaluate The Medications Intended For The Particular Disease And To Bring Out Necessary Changes In The Prescribing Practice [16]. The Drug Use Pattern Can Help To Improve The Rational Drug Therapy And Provide Effective Treatment For The Patients. Increased Risk In Death Rate For Diabetes Among Worldwide Is Mainly Due To High Blood Pressure. Over The Past Few Years Prevalence Rate Among Diabetes With Hypertension Has Considerably Increased. The Treatment For The Diabetes Mellitus Starts Initially With Singlet Therapy Followed By Doublet, Triplet, And Multi-Therapy If Required To Attain Better Glycaemic Control And To Prevent Its Co-Morbidities. The Study Also Shows That Maximum Numbers Of People Were Not Aware Of Their Health Status And Poor Diagnosis Leads To This Condition. Moreover Diabetes Mellitus With Hypertension Is Associated With Various Complications And Quite Significantly Leads To Death. This Is Due To Improper Diet Profile And Poor Lifestyle Management May Cause Increase In Blood Pressure Levels Associated With Diabetes [17].

The Present Study Deals With The Observational Data Of Large Number Of Subjects With Diabetes And Hypertension Attending The Bala's Star Hospital, Tiruvannamalai. To The Best Of Our Knowledge, No Such Type Of Profiles Has Been Reported From Tiruvannamalai. Our Main Motivation For This Analysis Was To Obtain The Risk Profiles, Prescription Pattern, Complication And Co-Morbidities Of Diabetes And Hypertension Patients. So That We Can Prevent Or Decrease The Burden Of Diabetes And Hypertension In Tiruvannamalai.

In Our Study Maximum Patients With Diabetes & Hypertension Were In The Age Group Between 41-60 And The Same Has Been Reflected In The Study Of Sriram A Et Al [18]. The Ratio Of Diseases Process Is Higher In Male Compared With Female. The Same Result Has Been Observed In The Study Of Mohd Mahmood Et Al[9]. In Observation With The Type Of Diabetic Patients Most Of The Patient Were Affected With Type 2 Diabetes And They Are Not Participating In Any Physical Activity And Have The Family History Of Diabetes And Hypertension. The Same Result Has Been Reflected In The Study Of Mayur Patel Et Al In 2019 [16]. In Accordance With The BMI Range Among The Diabetes And Hypertension Patients Most Of Them Falls In The Category Of Overweigh And Obese. While On Considering The Behaviours Factors Like Smoking And Alcoholism Most Of Them In The Study Were Non Smokers And Non Alcoholics The Similar Result Has Not Been Observed In The Study Of Siddarama Et Al [10] . The HBA1C Level Maintained By Most Of Patients Falls In The Range Of 6.6- 8.5,While On Glucose Tolerance Test Range Maximum Patients Falls In The Range Of 151-200 In Fasting Stage Where As In The Post Parental Level 201- 300. On Comparing With The Other Side The Data Shows The Concordant Results In Mohd Mohmood Et Al [9]. On Monitoring The Blood Pressure Range Of The Patients Most Of The Fall In The Range Of 120 – 139 Mm/Hg On Systolic And Diastolic Similar Finding Has Been Observed In Siddarama Et Al [10]. Serum Level Of Urea, Creatinine And Uric Acid Can Be Useful Prognostic Markers And Predictors Of Renal Damage In Diabetic And Hypertension Patients. Maximum Patients Falls In The Range Of Above 1.2 In Creatinine Level, Above 50 In Urea Level, And Above 7 In Uric Acid Level. Where As In The Study Of Arafath Et Al. Our Report Is Contraindication Which Is Slightly Deviating. The Patient With Increase In Dyslipedemic State Is Seen Diabetic And Hypertensive Patients Which Shows HDL Level Of 35 – 60, LDL Level Below 150, VLDL Level 10 – 40, Triglycerides Range 55 – 190 And Total Cholesterol In The Range Of 141 – 200 Which May Provide A Evidence For Heart Disease And Stroke As An Co Morbidities The Similar Result Has Been Reflected In The Study Of Arafath Et Al. Most Of The Patients With Diabetic And Hypertension Has The Complication Of Neuropathy And Few Have Other Complication Like Retinopathy, Nephropathy, Foot Ulcer, Weakness Etc. On Observing The Co-Morbiditis Data Most Of The Patients Were Affected By Peptic Ulcer [17].

On Assessing The Drug Use Pattern Of Diabetic And Hypertension Patients Most Of Them Hypertension In Singlet Therapy Were Treated With Telmisartan, Where As In Doublet Therapy Telmisartan With Chlorthalidone Is Used But On Triplet Therapy Combination Of Telmisartan With Amlodipine And Hydrochlorothiazide Is Used Widely, In Accordance With Diabetic Patients Vildagliptin Is The Most Prescribed Oral Hypoglycaemic Agent In Singlet Therapy, But On Doublet Therapy Voglibose With Metformin Combination Is Widely Prescribed, Where In Triple Therapy Voglibose With Metformin And Glimepride Combination Is Abidingly Used In The Treatment Protocol, While On Comparing The With Sriram A Et.Al [18] Study The Prescription Pattern Totally Differs.

CONCLUSION

The Prospective Observational Study Conducted In The Outpatients Of Diabetes And Hypertension In Tiruvannamalai Which Revealed That A High Proportion Of Factors, Such As Obesity, Family History Of Diabetes, Dyslipidaemia, Uncontrolled Glycaemic Status, Sedentary Lifestyles Were Prevalent In Diabetes And Hypertension Patients. Hence, Apart From Optimal And Appropriate Prescribing, There Is A Need For Lifestyle Modification Such As Physical Exercises, Yoga, Meditation And Reduction In Obese Level. Combination Therapy Was Observed In A High Percentage Of Prescriptions Compared With Monotherapy. Patients Should Be Made Aware Of Non-Medical Factors Like BMI, Food Habits Which Contribute To Their Well-Being And Should Be Educated About The Importance Of Being Aware Of Their Medical History, Drug Allergies, Etc. Future Management Of Diabetes And Hypertension Should Be Based Not Only On The Efficient Use Of Existing Agents But Hopefully Future Agents That Will Provide Improved Efficacy And Clinical Efficiency.

Based On The Observed Results The Following Steps Were Recommended For The Management Of The Patients With Diabetes And Hypertension: Uncontrolled Glycaemic Level & Blood Pressure Levels, Dyslipidaemia, And Vision Impairment Should Be Taken Care By Conducting Early Screening For Complications, Frequent Check-Ups, And Follow-Ups. Prevention Of Diabetes And Hypertension Needs To Have Lifestyle Modification Like Body-Weight, Diet Regulation, Yoga And Exercise Should Be Emphasized.

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Authors' Contributions

All The Authors Are Involved In Review Of Literature, Collection Of Data And Preparation Of The Manuscript And Also They Were Involved In Reviewing And Editing Of The Manuscript.

Conflict Of Interest

There Is No Conflict Of Interest For This Review

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