Utilization of Antidiabetic Drug and Assessment of Risk, Severity in Diabetes with Covid – 19 in Dehradun Region

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ABSTRACT

Background: Diabetes is a long-life disorder, which is mainly affected by diet, exercise, infection and stress variations day by day. Around 143 million people in worldwide are affected. Covid 19 is a highly spreadable disease, occur due to corona virus.

This study highlights the relationship between drug utilization in diabetes and their severity and risk assessment with covid 19.

AIM: Utilization of antidiabetic drug and assessment of risk, severity in diabetes and diabetes with covid-19 in Dehradun region.

Material and method: The study is conducted in different region of Dehradun. a questionnaire is design to evaluate the drug utilization of anti-diabetic drug and their risk assessment with Covid -19. Around 119 patients over a period of 6 month was taken n a consideration, on a regular basis filled out the study questionnaires after being formally informed and consenting to participate. All Questionnaire was filled after asking the questions of patient and record all data to conclude result.

Conclusion: We observed that diabetes was more reported as compared to diabetes with covid – 19 on multiple visit of hospitals and clinics, there are vast gender differences were occurs in which prevalence of diabetes and diabetes with covid -19 were most common in male as compare to female.

1. INTRODUCTION

Drug utilization means that prescription, distribution, marketing and their use in society, with intensity on the resulting medical and social significance with their main aim to assist rational use of drug in population (1).

Diabetes is a metabolic disorder which results in hyperglycemia condition along with abnormalities in protein, lipid, and carbohydrate metabolism brought on by deficiencies in insulin secretion or action, or both (2).

1.1 Type of diabetes

It is classified into 3 types: 1) Type 1Diabetes 2) Type 2 Diabetes 3) Gestational diabetes mellitus (GDM).(3)

1) Type 1 diabetes – Destruction of beta cells occurs which Leading to deficiency of insulin.

Type 1 Diabetes ➡ beta cell destruction ➡ no insulin secretion and Glucose channel   closed.

2) Type 2 diabetes - it is known as non-insulin-dependent diabetes mellitus (NIDDM) . in this type of diabetes insulin releases but does not bind with its receptor which result in a hyperglycaemic condition. (4)

3) Gestational Diabetes Mellitus (GDM) - It usually develops near the end of the 3rd trimester or the beginning of the 4th trimester. Then after delivery situation becomes normal. Glucose is utilized by the body cell as a source of energy. Abnormal level of glucose during pregnancy can be extremely harmful to both the mother and baby. (5)

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1.2 Antidiabetic drugs

Antidiabetic class	Antidiabetic drug	Mechanism of action	Advantages	Disadvantages
Alpha glycosidase inhibitor	Acarbose, Miglitol Voglibose	Inhibit carbohydrates degradation (intestinal villi)	Weight neutral	Gastrointestinal side-effects Negligible effect on cholesterol Potential elevations in liver function tests
Biguanides	Metformin	Block liver gluconeogenesis, increase glucose uptake (muscle), decrease the absorption of glucose (intestinal mucosa)	Long-term safety Weight neutral or loss Low risk of hypoglycaemia	Contraindicated for patients with liver or heart failure
Sulfonylureas	Glibenclamide Glimepiride	Increase insulin secretion by activating beta- cell SUR 1	Long-term safety	Risk of hypoglycaemia , Risk of weight gain
Meglitinides	Nateglinide Repaglinide Mitiglinide	Binds to beta-cell SUR 1	Faster insulin response	Risk of weight gain and hypoglycaemia
GLP-1 receptor agonists	Exenatide Liraglutide	Binds to GLP-1 receptor, causing: increase insulin secretion, delayed gastric emptying, and satiety.	Weight loss Low risk of hypoglycaemia	Gastrointestinal side-effects Administration by subcutaneous injection
DPP-4 inhibitors	Sitagliptin Saxagliptin Alogliptin	An increase incretin (GIP and GLP-1) concentrations increase insulin secretion , enhance glucagon secretion	Weight neutral	Gastrointestinal side-effects
Thiazolidinediones	Pioglitazone Rosiglitazone	hepatic and adipose tissue increase glucose uptake in peripheral tissues	Low risk of hypoglycaemia	Risk of weight gain Risk of oedema Risk of heart failure
SGLT2 inhibitors	Dapagliflozin Canagliflozin	Limits renal glucose reabsorption	Weight loss Low risk of hypoglycaemia	Risk of genitourinary tract infections
Exogenous insulin	Rapid acting Short acting Intermediate acting Long acting	Activates the insulin receptor decreases hepatic glucose output	Numerous formulations and delivery systems	Risk of weight gain and hypoglycaemia Administration by subcutaneous injection

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2) Diabetes associated with covid 19 pathogenesis

Effects on glucose homeostasis, inflammation, altered immunological status, and activation of the renin–angiotensin–aldosterone system are all possible pathogenetic linkages between COVID-19 and diabetes mellitus (RAAS).In patients with diabetes mellitus, tight glucose control and prevention of diabetes   complications may be critical during the COVID-19 pandemic to keep susceptibility low and prevent severe COVID-19 courses. Evidence suggests that insulin and dipeptidyl peptidase 4 inhibitors can be used safely in patients with diabetes mellitus, and COVID-19 metformin and sodium– glucose co-transporter 2 inhibitors may need to be withdrawn in patients at high risk of sever disease.

Because pharmacological medicines under research for the treatment of COVID-19 can alter glucose metabolism, especially in individuals with diabetes mellitus, frequent blood glucose monitoring and individualised medication adjustments are required. Patients with diabetes mellitus should closely follow general preventative principles and monitor glucose levels more regularly, engage in physical activity, eat healthily, and reduce other risk factors because COVID-19 has no clear treatment. Patients and health-care professionals should pay special attention to their adherence to prescribed drugs (including insulin injections) and their blood glucose levels, which should be tested more regularly than before. Patients should see their doctor if their blood glucose levels are consistently higher than normal. In view of current worldwide quarantine rules, health-care practitioners should place a greater focus on good food intake and physical activity in diabetic patients. They should be urged to see their doctor right away if they have symptoms such as a dry cough, high sputum production, or fever, or if their blood glucose level suddenly rises.

2.1) Symptoms included

Such as a dry cough, increased sputum production, or fever, or who have a sudden spike in their blood glucose level, should see their doctor every once. To limit the risk of infection in diabetic patients, general measures should be closely observed by both health-care workers and their patients, such as social distancing, wearing a mask, washing hands, and using disinfectants (6) . Diabetes is a prominent determinant in severe COVID-19 morbidity, according to epidemiologic studies of the SARSCoV-2 [COVID-19] pandemic, and COVID-19 has had a disastrous effect on the diabetic community. They discuss the relationship between diabetes and COVID-19-related morbidity and mortality, as well as the predictors of

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severe adverse outcomes and the pandemic's overall implications. According to case studies, COVID-19-related hospitalisation, severe morbidity requiring intensive care, and/or death affect 30–40% of people with type 2 or type 1 diabetes. In hospitalised diabetics, intensive care was necessary in 21–43 percent of cases, with a 25% case fatality rate. Even when socioeconomic demographic variables and concomitant illnesses are taken into consideration, persons with diabetes have a 100–250 percent higher risk of severe morbidity and fatality than those without. Overall death rates in the diabetic community were 50% higher than historical trends, a net increase more than double those of the general population. 75–80% of the excess deaths are not explicitly attributed to COVID-19, which raises unanswered questions about missed attribution or collateral effects. Expanding epidemiologic study into the diabetes-COVID 19 , where diabetes affects 80% of the population and the COVID-19 pandemic has been so destructive. [7] Treatment with steroids can have a deleterious impact on diabetes, worsening hyperglycemia because to increased insulin resistance and decreased b-cell secretory activity. As a result, increasing hyperglycaemia has the potential to stymie COVID-19's progress. [8].

4) OBSERVATIONS AND RESULTS:

The study enrolled approximated 119 Patient who were suffering from diabetes and diabetes with covid -19 during the study.

Demographic details of patients who suffer from diabetes and diabetes with covid – 19 .

Approximately 119 patient complete the questionnaire in which 75 was male and 44 patient was female . in my study more diabetic patients were observed as compared to diabetic with covid 19 . In our study mostly male group were affected by diabetes and diabetes with covid -19 as compared to the female group .

Severity of the diseases:

The severity of the acute attack in 119 patient, mild was seen 72(60.5%) Moderate was 38 (31.9%) severe in 9(7.56%) table no 4 .

Drug used for diabetes and diabetes with covid 19 on multiple visit :

Table no. 1 shows Demographic detail of the study population representing male and female group affected from diabetes and diabetes with covid -19 . Table no. 2 provide Demographic (age) characteristic of the study population being treated with anti-diabetic drug.

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Table no 1 : Demographic detail of the study population representing male and female group affected from diabetes and diabetes with Covid -19 .

S.NO	SEX	TOTAL NUMBER OF PATIENTS (n=119)	DIABETES (78)	DIABETES WITH COVID -19 (41)
1	Male	75	45	30
2	Female	44	33	11

Total number of patient (n=119)

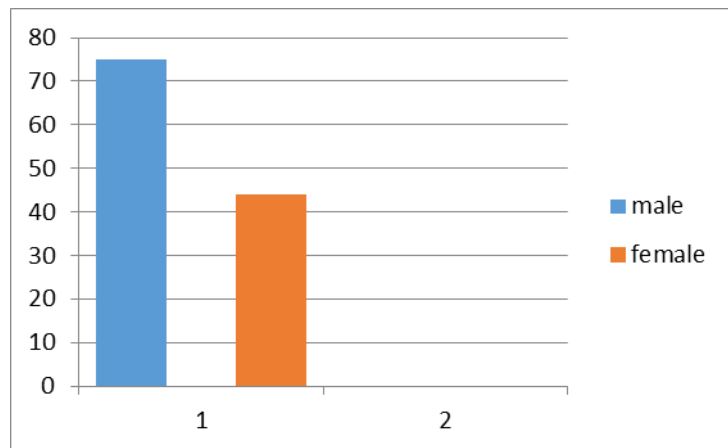**Figure no 1 : Colum chart representing male and female groups affected by diabetes and diabetes with covid -19.**

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Table no.2: Demographic (age) characteristics of the study population being treated with anti-diabetic drugs.

s.no	Age	Total no. of patient (119)		Diabetes (78)		Diabetes with covid -19 (41)	
		Male (75)	Female (44)	Male (45)	Female (33)	Male (30)	Female (11)
1	25-35	9	6	4	5	5	1
2	36-45	18	12	10	7	8	5
3	46-55	13	11	11	10	2	1
4	56-65	20	7	10	5	10	2
5	66-75	12	8	7	6	5	2
6	76-85	2	-	2	-	-	-
7	86-95	1	-	1	-	-	-
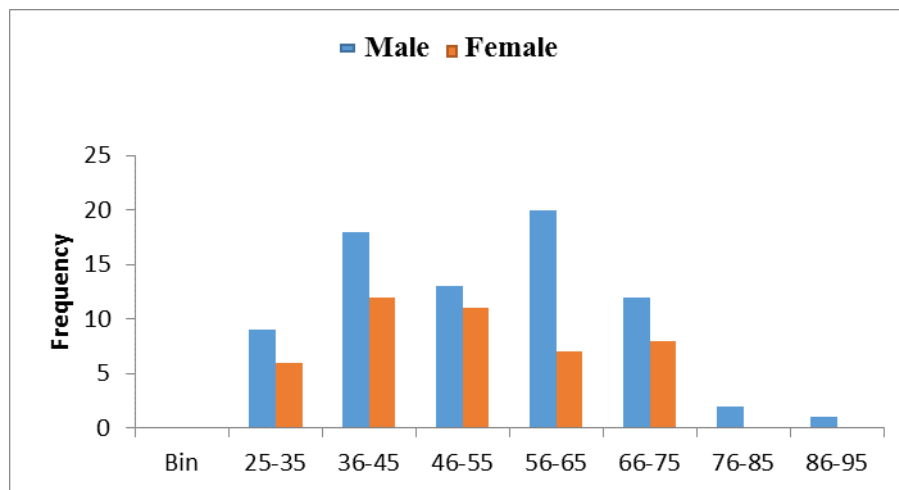
Figure No 2 : Column Chart representing gender difference of diabetes and diabetes with covid – 19.

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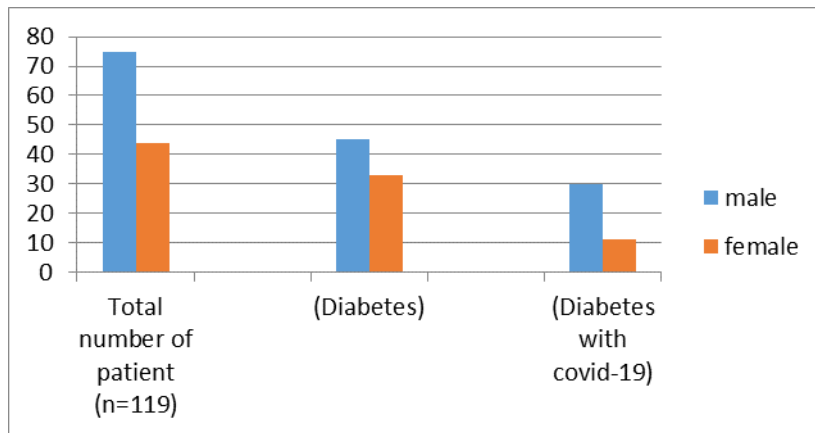
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Figure No 3 : Demographic (Age) detail of the study population representing male and female group affected from diabetes and diabetes with Covid -19.
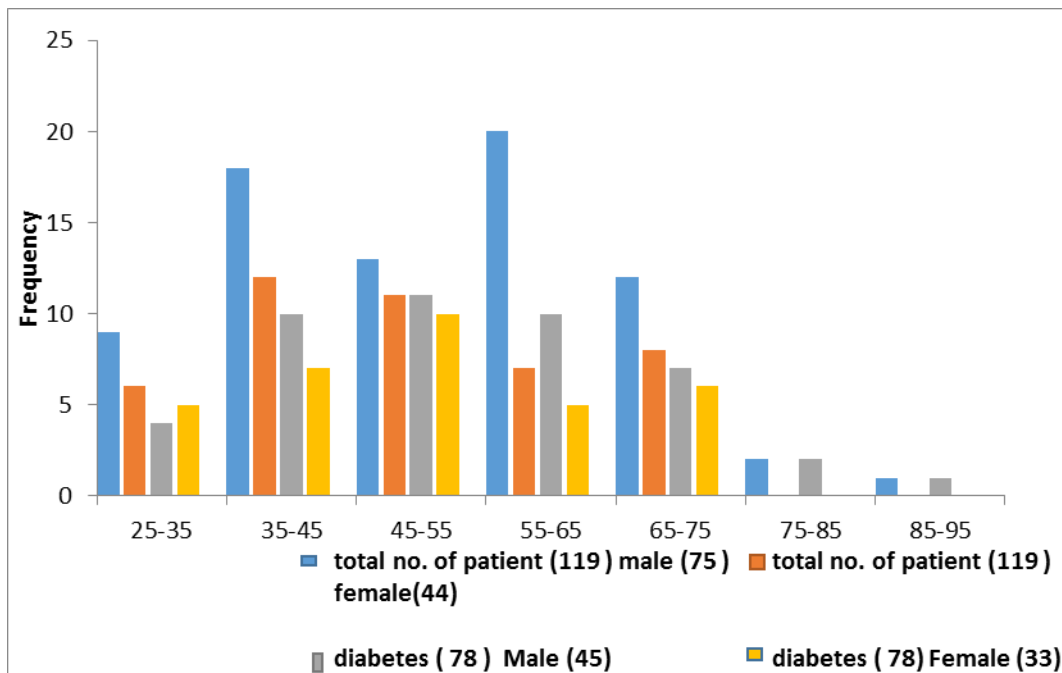

Figure No 4 : Colum chart represent gender and age differences of diabetes disorder
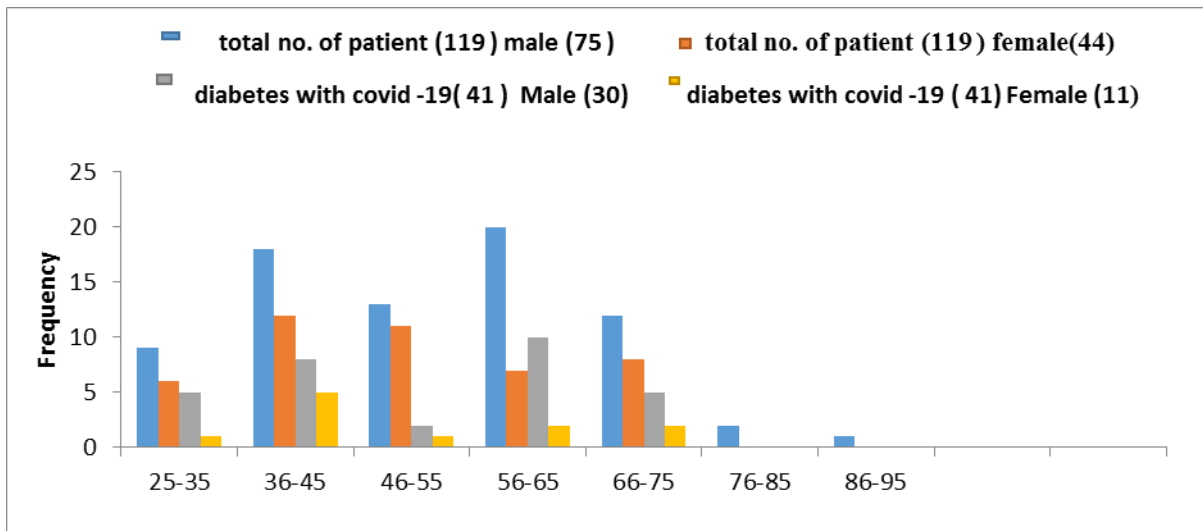
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Figure No 5 : Colum chart represent gender and age difference of Diabetes with covid - 19 .

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Table no 3 : a common drug used for diabetes (Antidiabetic) and covid-19 on multiple vision

S.NO	COMMON DRUG USED	NO. OF TIMES(%)
1	Metformin +Vildagliptin +Voglibose	72
2	Telmesartan + Hydrochlorothiazide	41
3	Multivitamin	45
4	Pantoprazole	25
5	Glicazide + Metformin +Hydrochlorothiazide	19
6	Metformin(500mg)	85
7	Amlodipine	13
8	Voglibose	9
9	Calciferol 60K	12
10	Olmesartan	7
11	Metformin + Vildagliptine	14
13	Glimipride + Metformin	15
14	Glimipride + Metformin + Viglibose	17
15	Vildagliptine + Metformin	10
16	Telmesartan	8
17	Aspirin	14
18	Dabigartan	2
19	Amlodipine	9
20	Insulin	14
21	Torsemide	1
22	Rabeprazole	4
23	Rosuvastatin	7
24	Levothyroxine	8
25	Esomeprazole+ Domperidone	4
26	Thyroxin	5
27	Pantosec	8
28	Dexamethasone	45
29	Dolo 650mg	86
30	Azithromycin 500mg	85
31	Cetirizine 10mg	34

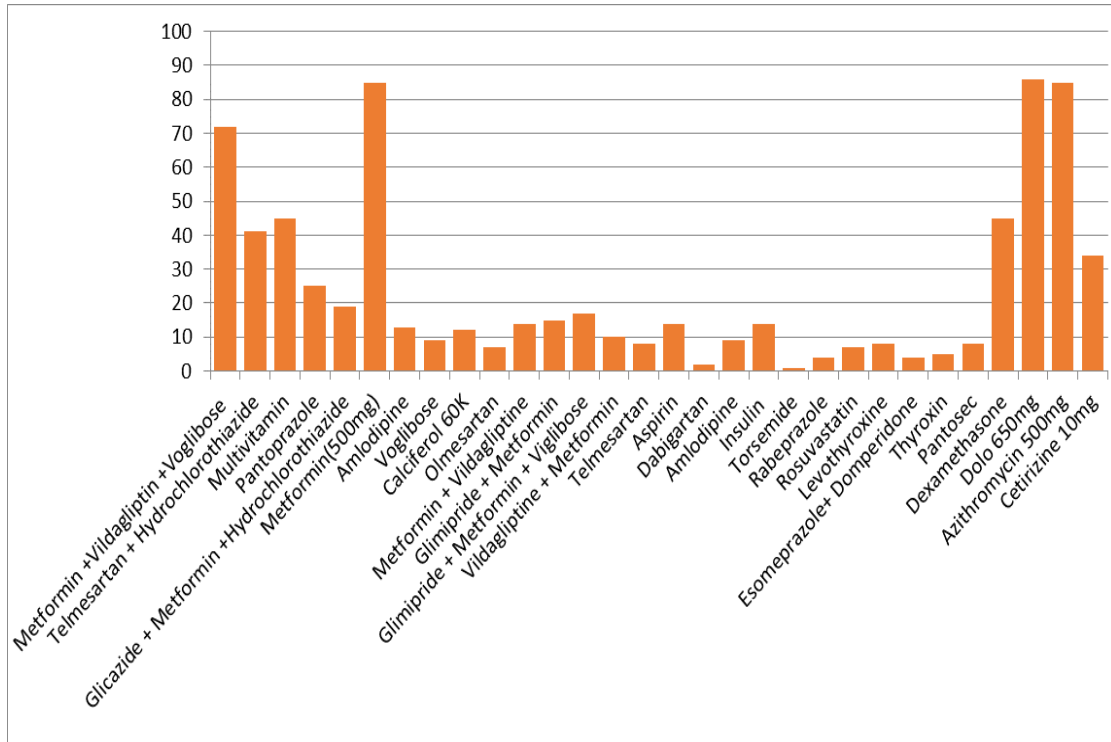*Citation: KIRAN et al. Ijppr.Human, 2023; Vol. 27 (4): 663-676.*

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Figure No 6 : Colum chart represent drug used for diabetes (Antidiabetic) and covid-19 on multiple vision

Table no 4 : common therapy used to treat diabetes

S.NO	Therapy	Value (%)
1	Ayurveda	12%
2	Allopathic	85%
3	Homeopathic	6%
4	Unani	2%
5	Others	3%
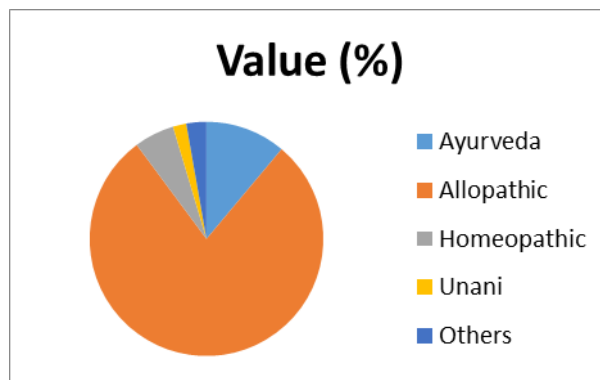
Figure No 7 : pie chart represent common therapy use to treat diabetes

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Table no 5 : Severity of acute attacks

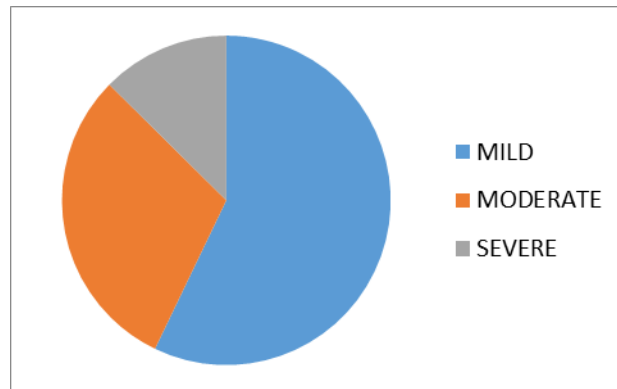| SEVERITY	No. of patients (%)
MILD	68 (57.1%)
MODERATE	36 (30.2%)
SEVERE	15 (12.6%)

Figure No 8: pie chart representing severity of attack

Table no 6 : Severity between diabetes patient and diabetes with covid 19

SEVERITY	No. of diabetic patient (78)	No. of diabetic with covid 19 patient (41)
MILD	56(71.7%)	12(29%)
MODERATE	20(25.6%)	16(39%)
SEVERE	4(3.36%)	11 (9.24%)
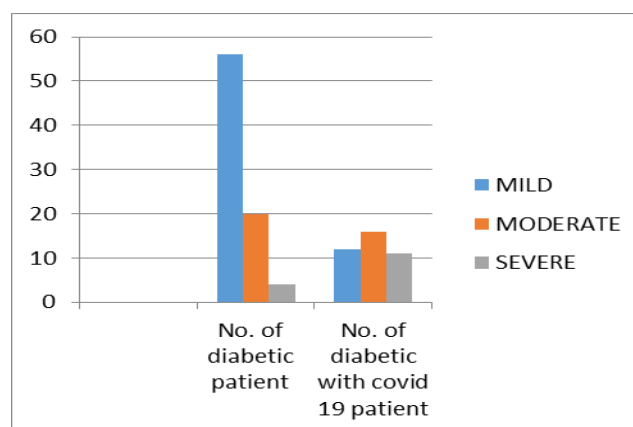
Figure no : 9 column chart of severity between diabetic patients and diabetic with covid -19 patients .

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CONCLUSION:

We observed that diabetes was more reported as compare to diabetes with covid – 19 on multiple visit of hospitals and clinics , there are vast gender differences were occurs in which prevalence of diabetes and diabetes with covid -19 were most common in male as compare to female .

Observation showed that bad habit (smoking , drinking etc) , genetic , diet . is the main issue which cause diabetes and diabetes with covid -19 .

Common symptoms were seen in diabetes and diabetes with covid -19 patient are – coughing , fever ,chillness , fatigue , muscle pain , joint pain etc.

On the basis of our survey we conclude that bad daily habit (like – smoking, alcohol consumption, not regular exercise etc) , bad food habit and genetic are responsible for diabetes . and for covid-19 not follow the covid 19 guidelines properly , less awareness about covid 19 illness . The impact of disease also effect the surrounding including family , friend , and society . Precaution should be must to taken .

The drug which were more proven for the treatment of diabetes and diabetes with covid -19 were mostly anti diabetic drug, antibiotic , antipyretic , antihypertensive . The combination form of drug is commonly effect or commonly prescribed to the diabetes patient and diabetic with covid -19 which is seen in the study. Which mean poly therapy were most effective then single therapy in diabetes and diabetes with covid -19 treatment .

FUTURE SCOPE OF THE STUDY

The scope of the research work includes the followings:

To provide knowledge about the bad habits(smoking , alcohol etc) , related to diet intake , benefits of regular exercise and guidelines (covid guideline) to prevent from the diabetes and diabetes with covid 19 , assess the quality of life of patient visiting primary care hospitals in Dehradun and examine different diabetes and diabetes with covid 19 symptoms .

The information collect during the study will contribute in the world wide healthcare symptoms by provide an information about diabetes and diabetes with covid 19.

To encourage the all health professionals by reporting study of diabetes and diabetes with covid 19 to improve the health of the public and make sure use of proper medicines .

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Current and future research efforts promise to further expand our knowledge of the biological bases for diabetes and will likely contribute a number of new antidiabetic treatments.

There is need for futher study the course of diabetes and diabetes with covid 19 in india so as to determine the need and duration of continuation treatment . studies should also evaluate the cost- effective models of treatment which can be easily used in the primary care location to effectively treat diabetes and diabetes with covid -19.

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