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QUANTIFYING THE INCIDENCE OF INFECTIOUS DISEASES AND ASSESSMENT OF PRESCRIPTION PATTERN OF ANTIBIOTICS IN DIABETIC PATIENTS AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Diabetes is a group of metabolic diseases characterized byhyperglycaemia. It happens when your body doesn't process insulin effectively or when your pancreas doesn't produce any insulin at all.Infections are common cause of morbidity and mortality in patients with diabetes. Diabetes confers an increased risk of developing and dying from an infectious disease. Diabetes seems to increase the incidence and severity of many common infections, especially those caused by bacteria,virus and fungi, and for some infections there is evidence that hyperglycaemia and hypoglycaemia control correlate with infection risk and outcome. Aim: The aim of this study is to evaluate the incidence of infectious diseases & Prescription pattern of antibiotics in the diabetic patients. Methodology: In our study the main outcome is to identify the incidence of infectious diseases in patients with diabetes and assessing their prescription pattern of antibiotics. Results & Discussion: We have used different variables such as age, gender, duration of antibiotics, GRBS, HbA1C as risk factors for infections in diabetic patients and evaluated their prescription pattern of antibiotics. In this study we have followed the Pearson correlation and regression analysis and based on the different variables relationship the final outcome is positive. our secondary outcome is to educate patients regarding lifestyle modifications and encourage early medical consultation. Conclusion: Apart from medical screening, Educating the patients regarding Lifestyle modifications and diabetes related infections may aid to control the occurrence of infections in Diabetes patients.

Keywords: Diabetes Mellitus, Gross Random Blood Sugar Levels, Glycosylated Haemoglobin Concentration

INTRODUCTION

Diabetes mellitus is derived from the Latin term mellitus, which means sweet, and the Greek word diabetes, which means to syphon or pass through. The sweet character of the urine in this illness was discovered by the ancient Greek, Hindu, and Egyptian civilizations, leading to the spread of the term diabetes mellitus.

Diabetes is a group of metabolic diseases characterized by when your blood sugar (glucose) level is too high, you develop diabetes. It happens when your body doesn't process insulin effectively or when your pancreas doesn't produce any insulin at all.

HOW INSULIN WORKS

The purpose of insulin in the body is to cause cells to take up glucose so that the cells can utilize this sugar's ability to produce energy. Diabetes patients may have malfunctioning beta cells, which reduces insulin output, or their muscle and adipose cells may be resistant to the effects of insulin, which reduces these cells' capacity to absorb and utilize glucose. In both situations, an increase in blood glucose levels results in hyperglycemia (high blood sugar). As blood levels of glucose rise, extra amounts of this sugar are expelled in the urine. Due to higher levels of glucose in the urine, more water is expelled along with it. This results in an increase in urinary volume, urination frequency, and thirst.

ETIOLOGY

Diabetes is mainly caused when The human body's ability to create and regulate insulin, the hormone that controls blood sugar, as well as how it metabolizes carbohydrates,

are both directly impacted by diabetes. It may cause blood glucose levels to rise and cause glucose to accumulate in the urine [1-2].

Family History

An individual's family history of the condition is a crucial factor in determining whether they will get diabetes. If both parents have type 1 diabetes, the probability of inheriting the ailment increases. Some people with a genetic predisposition to type 1 develop it as a result of triggers in their infancy or adulthood.

Obesity

Many people with type 2 diabetes are overweight. Hormone resistance brought on by being overweight prevents cells from receiving the necessary amount of insulin. The likelihood of having the condition increases with time spent being overweight.

Environmental conditions

The body attempts to raise its core temperature when it is constantly chilly by delaying the normal production of important hormones. More blood sugar produces more heat.

Physical activity

The onset of type 2 diabetes can be influenced by physical inactivity. The body has little incentive to burn off calories taken when the heart rate is not increased to increase metabolism. Cardiovascular and circulation complications may result from this. The benefits of regular exercise include increased metabolism, weight loss, and a decreased risk of diabetes.

Genetic mutations

Diabetes that is monogenic can result from mutations in a single cell. These mutations can appear in people without a genetic predisposition to the illness, despite the fact that they are typically hereditary. The pancreas can't produce as much insulin as the cells need because of the cell mutations. Neonatal diabetes may result from this, and it typically manifests within the first six months of life. In teenagers and young adults, they can also result in diabetes with maturity-onset.

Cystic Fibrosis

The lungs, digestive system, and other vital body systems can suffer significant damage from the fatal genetic disease cystic fibrosis. The most noticeable symptom of cystic fibrosis is a mucus that is heavy and viscous and can leave scarring in the pancreas. Damage to this organ disrupts the production of hormones, which can lead to diabetes.

Hemochromatosis

Over one million People have the rare condition hemochromatosis. The illness, which develops when the body produces too much iron, is relatively treatable. The pancreas, among other organs, might get harmed when the body wants to store more of this mineral than it can. It's possible for diabetes to develop secondarily.

Hormones Disorders

The excessive or insufficient synthesis of hormones brought on by some illnesses can lead to cell hormone resistance. When the body produces excessive amounts of cortisol, Cushing's syndrome develops. The excessive, protracted synthesis of growth hormones causes acromegaly. When the thyroid produces too much hormone, hyperthyroidism develops. Any of these disorders can induce diabetes because they interfere with the body's normal insulin levels2.

TYPES

The new system of classification distinguishes between various forms of diabetes mellitus: Pre-diabetes, type 1, type 2, gestational diabetes, monogenic diabetes, Latent Autoimmune Diabetes in Adults (LADA).

PREDIABETES

An elevated blood sugar level is referred to as prediabetes."Prediabetes" is a useful and convenient phrase used to describe impaired fasting glucose (IFG), impaired glucose tolerance (IGT), or an HBA1C of 6.0% to 6.4%, all of which indicate a high chance of developing diabetes and associated consequences in a given individual.

The long-term effects of diabetes, particularly those to your heart, blood vessels, and kidneys, may have already begun if you have prediabetes.. It is unclear what specifically causes prediabetes. Family history and genetics however, seem to be significant factors.There are typically no symptoms or indicators of prediabetes. Darkened skin on specific body areas may be a symptom of prediabetes. The groyne, armpits, and neck can all be affected locations.

Diagnosed by Glycosylated hemoglobin (A1C) test,Fasting blood sugar test,Oral glucose tolerance test,Children and prediabetes testing.And the lifestyle modifications are Eat healthy foods, Be more active,lose excess weight ,stop smoking,take medications as needed.

TYPE 1 DIABETES

Destruction of beta -cells that results in a complete lack of insulin often mediated by immunological processes.

In children and adolescents, as well as to a lesser extent in adults, polydipsia, polyphagia, and Polyuria the traditional trinity of symptoms linked to the start of the disease remain diagnostic markers along with over hyperglycemia..

Type 1 diabetics are need to take daily insulin replacement, either via injection or insulin pump. Regular exercise and eating a balanced diet full of whole grains, lean meat, nuts, legumes, and lots of fruits and vegetables are also possible management strategies.. These patients typically have type 1 diabetes mellitus in the "immune-mediated form" with islet cell antibodies and frequently have additional autoimmune diseases including Hashimoto's thyroiditis, Addison's disease, vitiligo, or pernicious anaemia..

TYPE 2 DIABETES

Type 2 diabetes develops when the body is unable to utilize insulin properly. It's commonly known as insulin resistance. Non-insulin dependent diabetes is another name for type 2 diabetes. Type 2 diabetes mellitus is caused by a combination of genetic, environmental, and metabolic risk factors. The most at-risk people have a history of diabetes mellitus in their families, are older, obese, and inactive. Insulin therapy may be recommended by your healthcare practitioner, as well as diabetes drugs that lower blood sugar. The following are some medications for type 2 diabetes. The first treatment for type 2 diabetes is typically metformin (Fortamet, Glumetza, and other brands). It primarily works by reducing the liver's capacity to produce glucose and increasing the body's sensitivity to insulin, which allows it to use the hormone more efficiently3-5..

GESTATIONAL DIABETES

When diabetes is discovered during pregnancy but is not immediately apparent as diabetes, it is referred to as gestational diabetes mellitus (GDM)..

It is linked to poor results for both the mother and the newborn. Reduced morbidity for both mother and child in GDM is a result of maintaining optimal blood glucose levels. Globally speaking, there are no standardized methods for diagnosing and screening GDM).. 90% of women with GDM respond well to nutritional therapy in terms of blood glucose levels. For the remaining 10% to reach the appropriate glycemic levels, insulin therapy is necessary. When it comes to glycemic management in pregnant women, metformin works just as well as insulin..

MONOGENIC DIABETES

Neonatal diabetes, maturity-onset diabetes of the young (MODY), and different diabetes-associated syndromes are only a few of the clinical disorders that fall under the umbrella of monogenic diabetes that are typically defined by early-onset diabetes. Over 30 different genes have been identified as being involved in monogenic diabetes, which is caused by single gene abnormalities that largely impair beta cell activity. Children with diabetes who test positive for the C-peptide but have negative antibodies should be examined and tested for monogenic diabetes genetically. Among the most prevalent forms of monogenic diabetes, accurate genetic diagnosis has an impact on treatment, which may include switching to sulfonylureas instead of insulin or other glucose-lowering medications or ceasing all pharmacologic therapy.

LATENT AUTOIMMUNE DIABETES IN ADULTS

LADA is a kind of diabetes without the requirement for insulin therapy that is characterised by gradually advancing autoimmune destruction to the islet beta cells in the early clinical stages. The delayed development of autoimmune injury to pancreatic beta cells is the root cause of latent autoimmune diabetes in adults (LADA). . The main cause of LADA's onset and progression is loss of islet -cell function brought on by autoimmunity, and those who have the condition have more remaining islet cells..

CLINICAL SYMPTOMS

Polyuria, polydipsia, weight loss, occasionally coupled with polyphagia, and hazy vision are signs of severe hyperglycemia. Neurologic symptoms may appear as the patient's blood glucose levels rise. Lethargy, specific neurologic impairments, or a change in mental state may all be present in the patient. The patient may eventually become unconscious. Together with prolonged hyperglycemia, growth impairment and susceptibility to specific infections are possible side effects. The nonketotic hyperosmolar syndrome (ADA) or hyperglycemia with ketoacidosis are immediate, potentially fatal effects of uncontrolled diabetes..

DIABETIC COMPLICATIONS

There are numerous issues linked to diabetes. Due to the damage to small blood vessels, microvascular disease and macrovascular disease are two terms used to describe the complications of diabetes (due to damage to the arteries). Microvascular complications include retinopathy, which could result in vision loss, nephropathy, which could cause renal failure, peripheral neuropathy, which raises the risk of foot ulcers, amputations, and Charcot joints, and autonomic neuropathy, which can lead to symptoms in the gastrointestinal, genitourinary, cardiovascular, and sexual systems. The two main macrovascular consequences are strokes brought on by cerebrovascular disease and accelerated cardiovascular disease, which together cause myocardial infarction. Depression and dementia are further ongoing effects of diabetes6-9..

DIABETES WITH INFECTIOUS DISEASES

Diabetes poses a serious risk for all types of infections. Both the incidence of infections necessitating hospitalization and the rates of infections occurring outside of the hospital have been widely documented. the effects of diabetes on the immune system, the prevalent infections associated with diabetes, and the effects of various treatments aimed at glycemic control as well as immunomodulation on infection outcomes. Diabetes is linked to lowered T cell response, decreased neutrophil function, and weakened humoral immunity . As a result, patients with diabetes are more susceptible to infections, including those that are common in the general population like ,respiratory, urinary tract, skin, and connective tissue infections as well as infections that are frequently linked to diabetes like rhino cerebral mucormycosis and emphysematous cholecystitis,cellulitis, pyelonephritis ,lower respiratory tract infection,pneumonia,sepsis,viral fever, urosepsis , tuberculosis etc..

AIM

The aim of this study is to evaluate the incidence of infectious diseases & Prescription pattern of antibiotics in the diabetic patients.

OBJECTIVES

- To determine which type of infection(i.e, bacterial, viral, fungal.. etc.) is more commonly occurring in diabetic patients.
- To determine effective antibiotic treatment for the benefit of diabetic patients.
- To identify the infections rate based on Age, Gender,GRBS, HbA1C.

METHODOLOGY

Approval of the Protocol by IRB

The protocol for the proposed study was submitted to the Institutional Review Board (IRB) of Nirmala College of Pharmacy, Atmakur, Mangalagiri, Andhra Pradesh. The protocol was approved by the

IRB (Protocol number): PD001/IRB/NRML/2022-23

Study Site

The study was conducted in medical wards of tertiary care hospital, with 350 bedded capacities. The hospital is providing both inpatient and outpatient services for the people with multi-specialty health care.

Study Design and Duration of the Study

An Observational, cross-sectional and Hospital based incidence study was conducted between JUNE 2022 and APRIL 2023 in the manipal hospital & VGR diabetic hospital located in Vijayawada.

Subject Recruitment

- We obtained written informed consent from all participants before inclusion in the study.
- We included the subjects based on our inclusion and exclusion criteria, and the criteria is as follows:

Inclusion Criteria

✓ Those who are willing to participate in our study.
✓ Both gender i.e., male and female.
✓ Age groups.
✓ Patients who are having Diabetes mellitus with infectious diseases and in those patients which type of antibiotics prescribed.
✓ Also included who are having diabetes in past along with any other comorbidities (like: HTN, Thyroid, COVID-19, CAD, Kidney problems)
✓ WBC & GRBS Ranges.
✓ Both Inpatients and out patients.

Exclusion Criteria

✓ Those who are not willing to participate in our study.
✓ Patients who are non diabetic.
✓ Patients who are not on antibiotic treatment.

Summary of study

Our study is Observational, Cross sectional design and Hospital based Case Control design and does not involve any follow-up for patients. An informed consent form was obtained from all individuals stating that they are:

✓ Willing to participate in study.
✓ We included the subjects based on our inclusion and exclusion criteria, we included
✓ 200study participants who was diagnosed as the type 2 diabetes with infection. Then we collected data form the patient case files. We prepared our data collection form. Later we compared variables between no.of infectious diseases in Diabetes mellitus with GRBS Levels.
✓ Then we determined HBA1C and culture tests for patients with diabetes & infection.
✓ And also differentiate the gender, age to identify the infectious rates in both groups
✓ And we mainly determine the infectious diseases in diabetes along with prescription pattern of antibiotics.

Variables and Data sources

We obtained data from the patient case file. We prepared our own data collection form and entered data in that form. The study duration per subject was up to 10min for each patient. Even though we collected whole data from case file, we observed the case files and ask the questionnaire regarding various factors to validate the data.

Demographic details

✓ Male
✓ Female
✓ Age

Diabetes history

✓ Age of Onset
✓ Duration of Diabetes
✓ Other co morbidities in their past history

Blood Glucose Levels

✓ Fasting blood glucose
✓ GRBS
✓ HBA1C

Cultures

✓ KLEBSIELLA
✓ PSEUDOMONUS AERGUNOSA
✓ E-COLI
✓ ENTEROCOCCUS
✓ MYCOBACTERIUM TUBERCULE
✓ HERPES ZOSTER
✓ ACID FAST BACILLI
✓ STAPHYLOCOCCUS AUREUS
✓ YEAST
✓ CANDIDA ABLICANS
✓ STREPTOCOCCUS PNEUMONIAE
✓ SCRUB TYPHUS

Diabetic Patients with Infections

✓ Cellulitis
✓ Pyelonephritis
✓ Lower respiratory tract infection
✓ Urinary tract infection
✓ Gastritis
✓ Pneumonia
✓ Tuberculosis

- ✓ Sepsis
- ✓ Viral hemorrhagic fever
- ✓ Urosepsis
- ✓ Otitis
- ✓ Sinusitis

Administrating Antibiotics

- ✓ PIPERACILLIN &TOZABACTUM
- ✓ DOXYCYCLINE
- ✓ CLINDAMYCIN
- ✓ CEPHAPERAZONE +SULBACTUM
- ✓ CEFUROXIME+POTASSIUM CLAVULANATE
- ✓ LINEZOLID
- ✓ METRONIDAZOLE
- ✓ AMOXICILLIN+POTASSIM CLAVULANATE
- ✓ LEVOFLOXACIN
- ✓ MEROPENEM
- ✓ TIGECYCLINE
- ✓ CEFPODOXIME
- ✓ CIPROFLOXACIN
- ✓ AZITHROMYCIN

Statistical Analysis

Data was analysed by using Pearson co-relation coefficient and regression analysis. The variables like age, gender, etc. and biochemical parameters was considered as risk factors.

Pearson Correlation co-efficient

A statistical measure of the linear correlation between two sets of data is the Pearson correlation coefficient (PCC), sometimes referred to as Pearson's r, the Pearson product-moment correlation coefficient (PPMCC), the bi variate correlation, or simply the correlation coefficient. It is essentially a normalized measurement of the covariance, with the result always falling between 1 and 1. It is the ratio between the covariance of two variables and the product of their standard deviations. The measure, like covariance itself, can only account for linear correlations between variables and ignores numerous other kinds of connections or correlations. As a straightforward illustration, one would anticipate a sample of high school students' ages and heights to have a Pearson correlation value that is significantly higher than 0, but less than 1. (as 1 would represent an unrealistically perfect correlation).

Regression Analysis

A collection of statistical techniques known as regression analysis is used to estimate the associations between a dependant variable and one or more independent variables. It can be used to simulate the long-term link between variables and how strongly the relationships between them are related. The larger the absolute value, the stronger is the relationship: '1'means a stronger positive relationship, '-1'means stronger positive relationship, '0' means no relationship at all.

RESULTS AND DISCUSSION

A Total of 200 diabetic patients with infectious diseases data were collected for the interpretation of results. The results of this study are as follows:

Table-1: No. of cases reported based on Gender

S.NO	GENDER	NO.OF CASES REPORTED
1	MALE	114
2	FEMALE	86

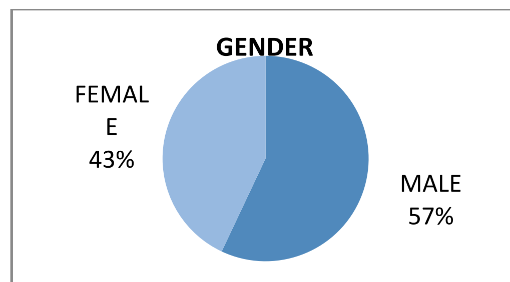

FIGURE 1: No.of cases reported based on Gender

INFERENCE: Among 200 patients, it is found that 57% of males are more prone to infections compared to females. This is because Females are found to have stronger Innate & adaptive immune responses than males.

TABLE 2: REGRESSION ANALYSIS BETWEEN GENDER AND ANTIBIOTICS

GENDER	ANTIBIOTICS
SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.023472971
R Square	0.00055098
Adjusted R Square	-0.004548249
Standard Error	1.11011952
Observations	198
ANOVA	
	Significance F
Regression	0.7427242
	Coefficients
Intercept	1.611684421
1	-0.033122503

INFERENCE: Based on Gender and Antibiotics, the regression analysis was done and shows the **F value is 0.7427242,** Which indicates the Moderate Positive correlation.

TABLE 3: REGRESSION ANALYSIS BETWEEN GENDER AND GRBS

GENDER	GRBS
SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.106219136
R Square	0.011282505
Adjusted R Square	0.006238028
Standard Error	73.58640032
Observations	198
ANOVA	
	Significance F
Regression	0.136384947
	Coefficients
Intercept	247.24251
1	9.989181092

INFERENCE:

The regression analysis of Gender & GRBS was carried out in which **F value was found to be0.136384947**, Hence it indicates the Weak Positive correlation between Gender & GRBS.

TABLE 4: REGRESSION ANALYSIS BETWEEN GENDER AND INFECTION:-

GENDER	NO.OF INFECTIONS
SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.00912263
R Square	8.32224E-05
Adjusted R Square	-0.005018394
Standard Error	0.315855884
Observations	198
ANOVA	
	Significance F
Regression	0.898499824
	Coefficients
Intercept	1.112849
1	-0.003661

INFERENCE: The regression analysis of Gender & Infection was carried out in which **F value was found to be 0.898499824,** Hence it indicates the Strong Positive correlation between gender and infection.

Table 5: No.of cases reported based on AGE

S.NO	AGE	NO.OF CASES REPORTED
1	20-30	1
2	30-40	5
3	40-50	46
4	50-60	54
5	60-70	68
6	70-80	31

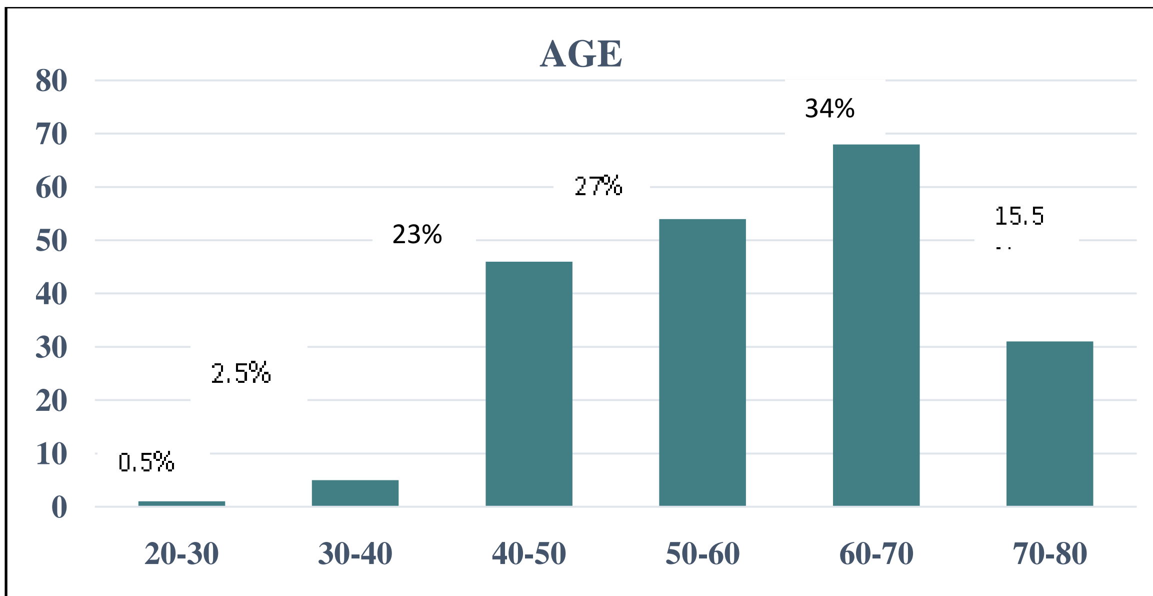

FIGURE 2: No.of cases reported based on AGE

INFERENCE: Among 200 Patients, it is observed that People with 60-70 yrs are more prone to diabetes due to deficiency of insulin secretion developing with age, growing insulin resistance caused by change in body composition. Pearson correlation coefficient is **0.687542.**

Table 6 : No.of cases reported based on INFECTION

S.NO	INFECTION	NO.OF CASES REPORTED
1	CELLULITIS	64
2	UTI	36
3	PYELONEPHRITIS	21
4	LRTI	16
5	GASTRITIS	15
6	PNEUMONIA	14
7	TB	11
8	SEPSIS	7
9	VHF	5
10	UROSEPSIS	4

11	OTITIS	4
12	SINUSITIS	3

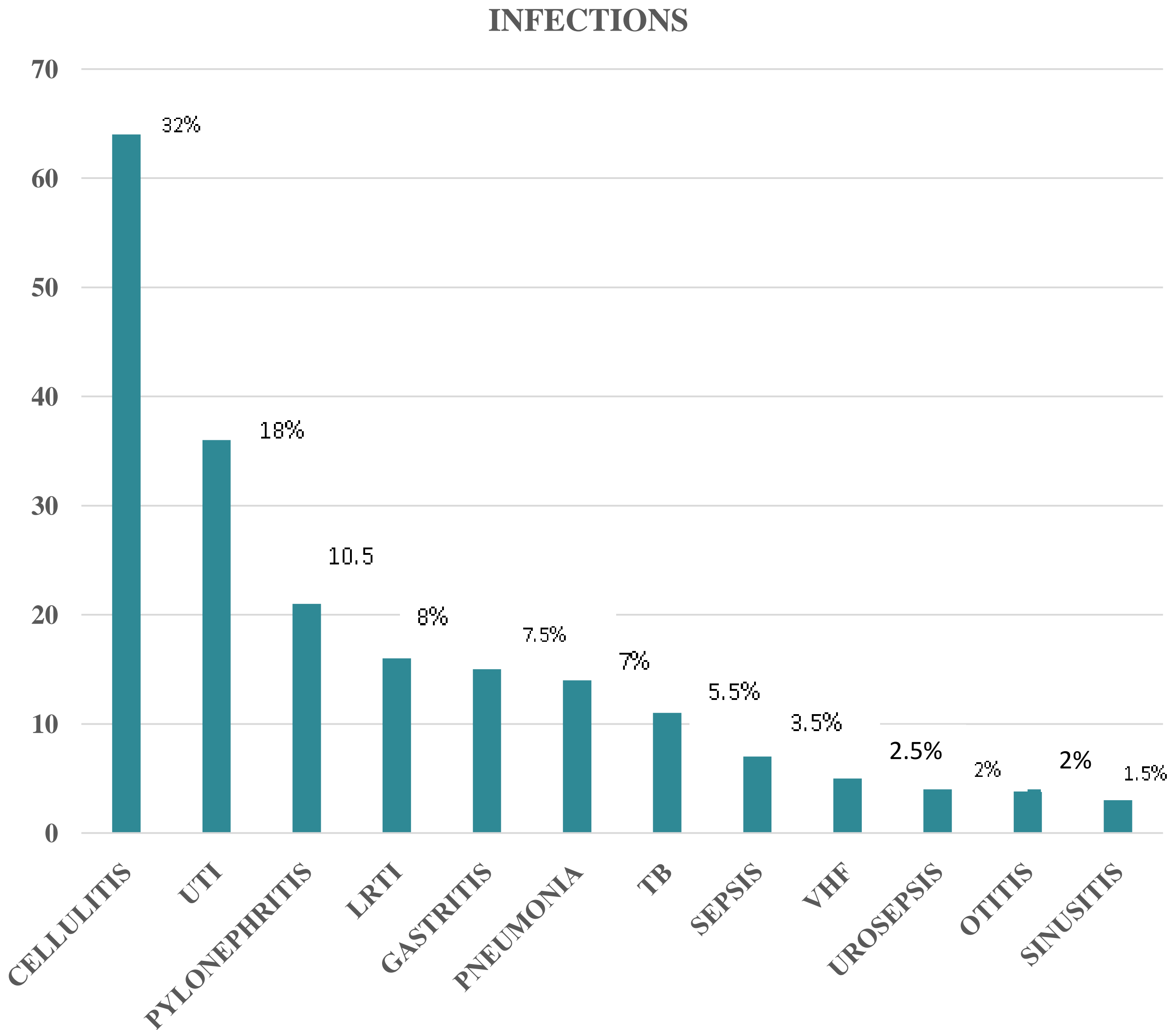

FIGURE 3: No.of cases reported based on INFECTION

INFERENCE: Among 200 Patients, it is observed that 32% of cellulitis cases was found to be frequently occurring in diabetic patients compared to other infections.

Table-7: No.of cases reported based on HISTORY OF DIABETES

S.NO	HISTORY OF DIABETES	NO.OF CASES REPORTED

1	1-5YRS	85
2	5-10YRS	80
3	10-15YRS	26
4	15-20YRS	6
5	20-25YRS	3

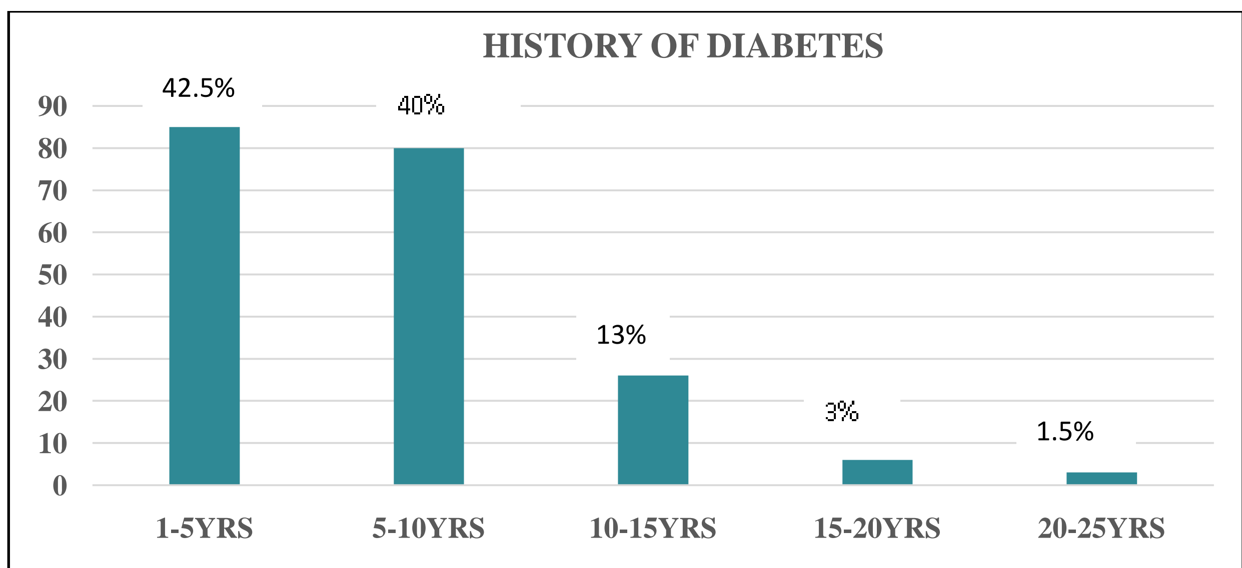

FIGURE 4: No.of cases reported based on HISTORY OF DIABETES

INFERENCE: Among 200 patients, it is observed that 42.5% Patients with history of diabetes more than 5yrs are more to infections due to poor glycemic control .

Table-8 : No.of cases reported based on **DIABETES WITH OTHER COMORBIDITES**

S.NO	DIABETES WITH COMORBIDITIES	NO.OF CASES REPORTED
1	HTN	62
2	THYROID	12
3	CAD	10
4	COVID	6

5	RENAL PROBLEMS	2

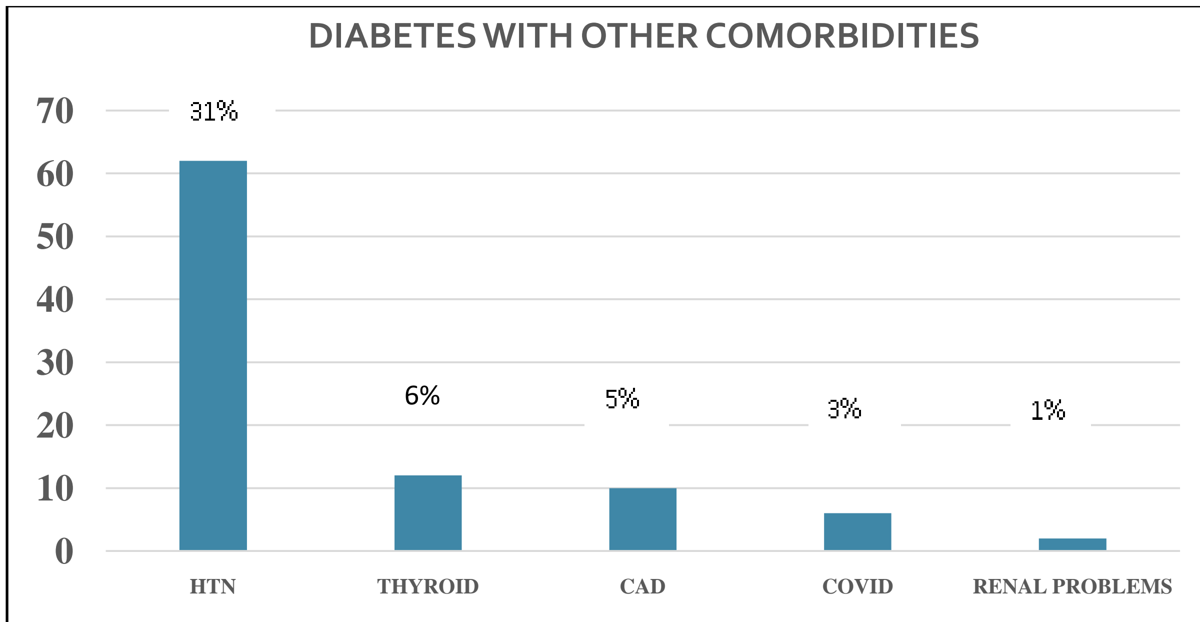

FIGURE 5: No.of cases reported based on **DIABETES WITH OTHER COMORBIDITESINFERENCE:** Among all the 200 patients, 92 patients were identified with Co-morbidities, in those diabetic patients with hypertension were found to be highest (62cases).

Table-9: No.of infections reported based on GRBS RANGES

S.NO	GRBS RANGES	NO.OF INFECTIONS REPORTED
1	NORMAL RANGE	4
2	DIABETIC RANGE	65
3	SEVERE	131

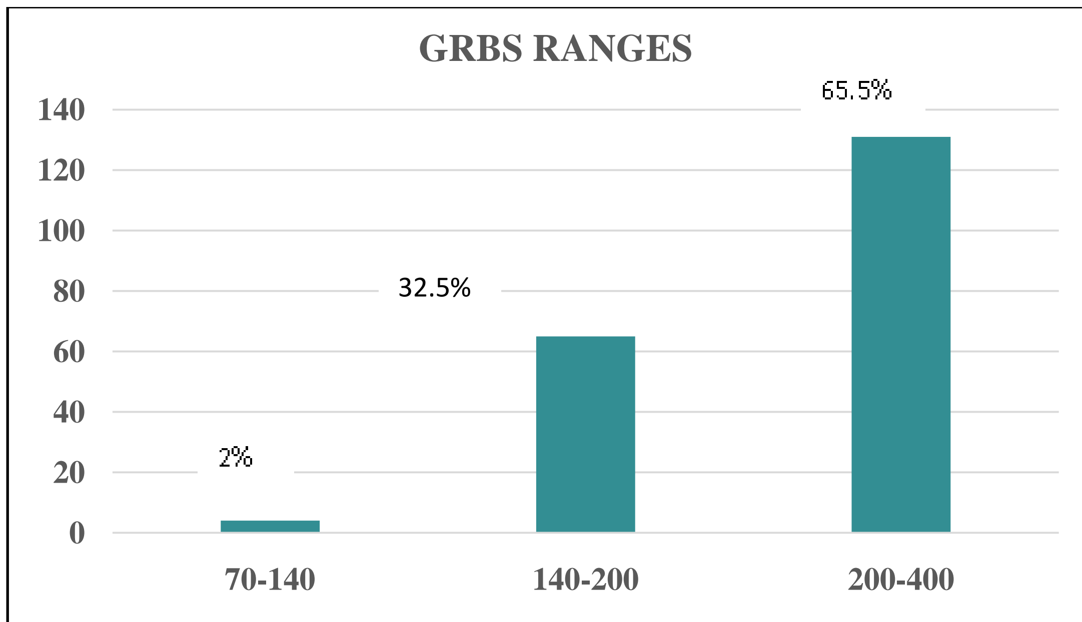

FIGURe 6: No.of infections reported based on GRBS RANGES

INFERENCE:
Among the 200 patients we observed that, Patient with GRBS ranges more than 200 were found more prone to infections. Because, Hyperglycaemia is associated with decreased PMN leucocyte mobilization, host defences, chemotaxis, phagocytic activity.

Table-10: REGRESSION ANALYSIS BETWEEN GRBS AND INFECTION:

GRBS	INFECTION
SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.074569507
R Square	0.005560611
Adjusted R Square	0.00053819
Standard Error	0.313590507
Observations	200
ANOVA	
	Significance F
Regression	0.293983105
	Coefficients
Intercept	1.029715119
255	0.000318307

INFERENCE: The regression analysis of GRBS & Infection was carried out in which F value was found to be0.293983105,Hence it indicates the Weak Positive correlation between GRBS and infection.

TABLE 11: NO.of cases reported based on HBA1C levels:-

S.NO	HbA1C	NO.OF CASES REPORTED

1	<6.5	28
2	>6.5	172

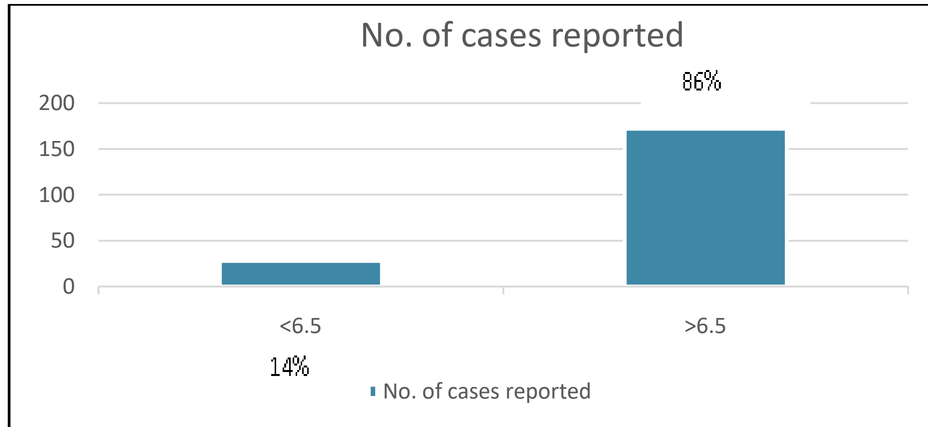

FIGURE 7: NO.of cases reported based on HBA1C levels

INFERENCE: Among 200 Patients, it is noticed that 86% of cases are in diabetic range (>6.5) with higher HbA1C levels.

TABLE 12: Regression analysis between HbA1C and Infections:-

HbA1C	NO.OF INFECTIONS
SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.043783579
R Square	0.001917002
Adjusted R Square	-0.003098491
Standard Error	0.313470458
Observations	201
ANOVA	
	Significance F
Regression	0.537126552
	Coefficients
Intercept	1.164077287
X Variable 1	-0.006185549

INFERENCE: The regression analysis of HBA1C & Infection was carried out in which F value was found to be0.537126552,Hence it indicates the Weak Positive correlation between HBA1C and infection.

TABLE 13: NO.of antibiotics prescribed based on HBA1C levels:-

S.NO	HbA1C	NO.OF ANTIBIOTICS
1	<6.5	43
2	>6.5	239

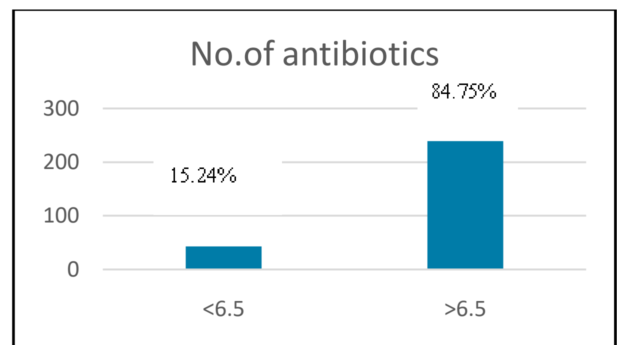

FIGURE 8: NO.of antibiotics prescribed based on HBA1C levels

INFERENCE: Among the 200 patients, it is observed that 84.75% antibiotics are Prescribed in diabetic range (>6.5) .Due to poor glycemic control patients are more prone to infections simultaneously prescription pattern of antibiotics aslo increased.

TABLE 14: Regression analysis between HbA1C and Antibiotics

HbA1C	ANTIBIOTICS
SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.113527694
R Square	0.012888537
Adjusted R Square	0.007903126
Standard Error	1.09883653
Observations	200
ANOVA	
	Significance F
Regression	0.109456742
	Coefficients
Intercept	2.0959275
12.8	-0.056851546

INFERENCE: The regression analysis of HBA1C & Antibiotics was carried out in which F value was found to be 0.109456742,Hence it indicates the Weak Positive correlation between HBA1C and Antibiotics.

Table 15: No.of cases reported based on CULTURE

S.NO	CULTURE	NO.OF CASES REPORTED
1	KLEBSIELLA	7
2	PSEUDOMONUS AERGUNOSA	6
3	E-COLI	5
4	ENTEROCOCCUS	4
5	MYCOBACTERIUM TUBERCULE	3
6	HERPES ZOSTER	2
7	ACID FAST BACILLI	2
8	STAPHYLOCOCCUS AUREUS	2
9	YEAST	2
10	CANDIDA ABLICANS	2
11	STREPTOCOCCUS PNEUMONIAE	1
12	CLOSTRIDIUM DIFFECITE	1

13	SCRUB TYPHUS	1

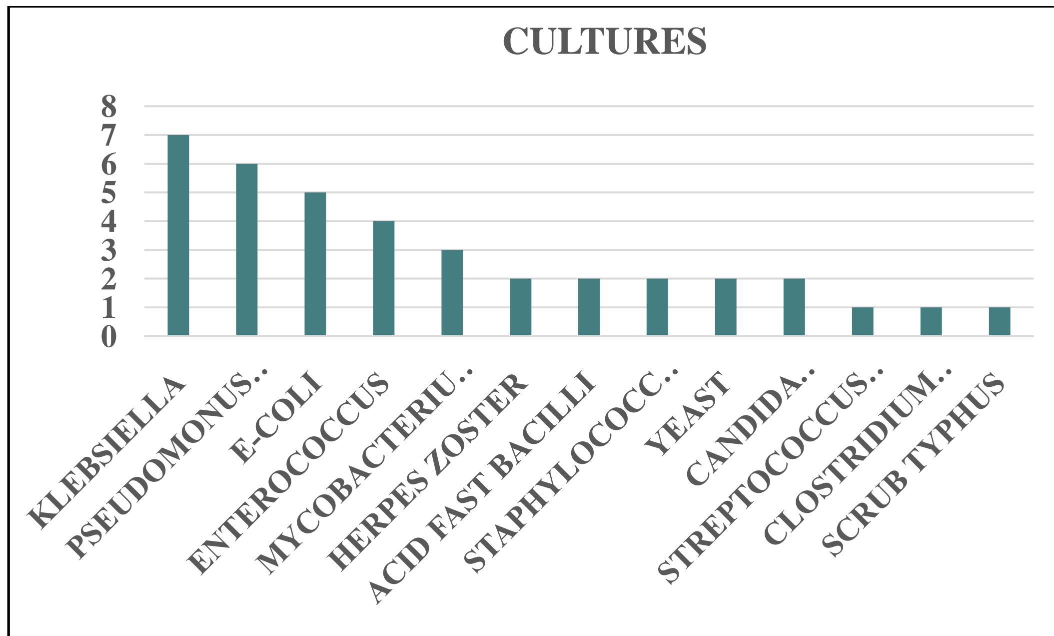

FIGURE 9: No.of cases reported based on CULTURE

INFERENCE: Among 200 Patients, it is identified that Klebsiella related infections are high compared to other organisms. Klebsiella is a gram negative bacilli, diabetes patients are at high risk for Klebsiella due to impairment of bacterial phagocytosis.

Table .10 : No.of Antibiotics prescribed based on culture

CULTURE	LINEZOLID	PIPERACILLIN &TOZABACTUM	DOXYCYCLINE	CEFAPERAZONE +SULBACTUM	AMIKACIN	METRONIDAZOLE	AMOXICILLIN+POTASSIUM CLAVULANATE	CLINDAMYCIN	LEVOFLOXACIN	CIPROFLOXACIN	MEROPENEM	TIGECYCLINE	CEFPODOXIME	AZITHROMYCIN	CEFUROXIME+POTASSIUM CLAVULANATE
KLEBSIELLA	3	3	1	1	0	0	0	0	0	0	0	0	1	0	0
PSEUDOMONUS AERGUNOSA	2	1	0	0	0	0	2	0	0	0	0	0	0	0	0
E-COLI	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0
ENTEROCOCCUS	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
MYCOBACTERIUM TUBERCULE	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0
HERPES ZOSTER	0	1	0	0	0	1	0	1	0	1	0	0	0	0	0
ACID FAST BACILLI	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
STAPHYLOCOCCUS AUREUS	2	1	1	0	0	0	0	1	0	0	1	1	0	0	0
YEAST	1	2	0	0	1	0	0	0	1	0	0	0	0	0	0
CANDIDA ABLICANS	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
STREPTOCOCCUS PNEUMONIAE	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CLOSTRIDIUM DIFFECITE	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0
SCRUB TYPHUS	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

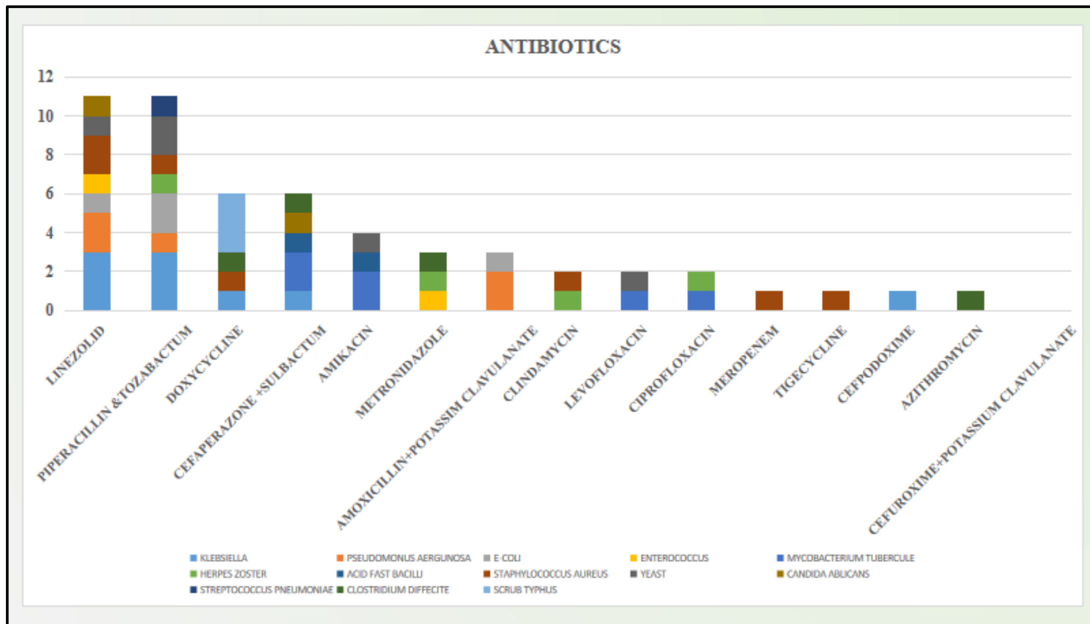

FIGURE: 10 No.of Antibiotics prescribed based on culture

INFERENCE: Among 200 Patients, it is noticed that Linezolid and Piperacillin +Tazobactum are prescribing most commonly based on Culture.

Table 11: No.of Antibiotics prescribed based on infection

ANIBIOTICS	CELLULITIS	PYLONEPHRITIS	OTITIS	SEPSIS	LRTI	GASTRITIS	TB	PNEUMONIA	SINUSITIS	UTI	UROSEPSIS	VHF
PIPERACILLIN &TOZABACTUM	19	6	2	2	2	1	2	7	2	4	0	1
DOXYCYCLINE	20	1	0	1	3	4	0	1	0	8	0	4
CLINDAMYCIN	24	2	1	0	1	3	1	0	0	6	2	0
CEPHAPERAZONE +SULBACTUM	6	1	0	3	15	1	4	5	0	0	1	0
CEFUROXIME+POTAS SIUM CLAVULANATE	11	0	0	0	0	3	2	1	0	11	0	0
LINEZOLID	8	2	0	2	0	0	0	4	2	1	2	0
METRONIDAZOLE	2	2	0	2	2	3	0	3	0	2	0	0
AMOXICILLIN+POTAS SIM CLAVULANATE	6	0	1	0	0	0	1	0	2	2	0	0
LEVOFLOXACIN	1	2	1	0	0	0	1	3	1	2	0	0
MEROPENEM	4	3	0	3	0	0	0	0	0	0	0	0
TIGECYCLINE	6	0	0	0	0	0	0	0	0	0	0	0
CEFPODOXIME	0	0	0	1	0	1	2		1	0	0	0
CIPROFLOXACIN	0	0	0	0	0	0	1	1	0	0	0	0
AZITHROMYCIN	0	0	0	0	0	1	0	0	0	0	0	0

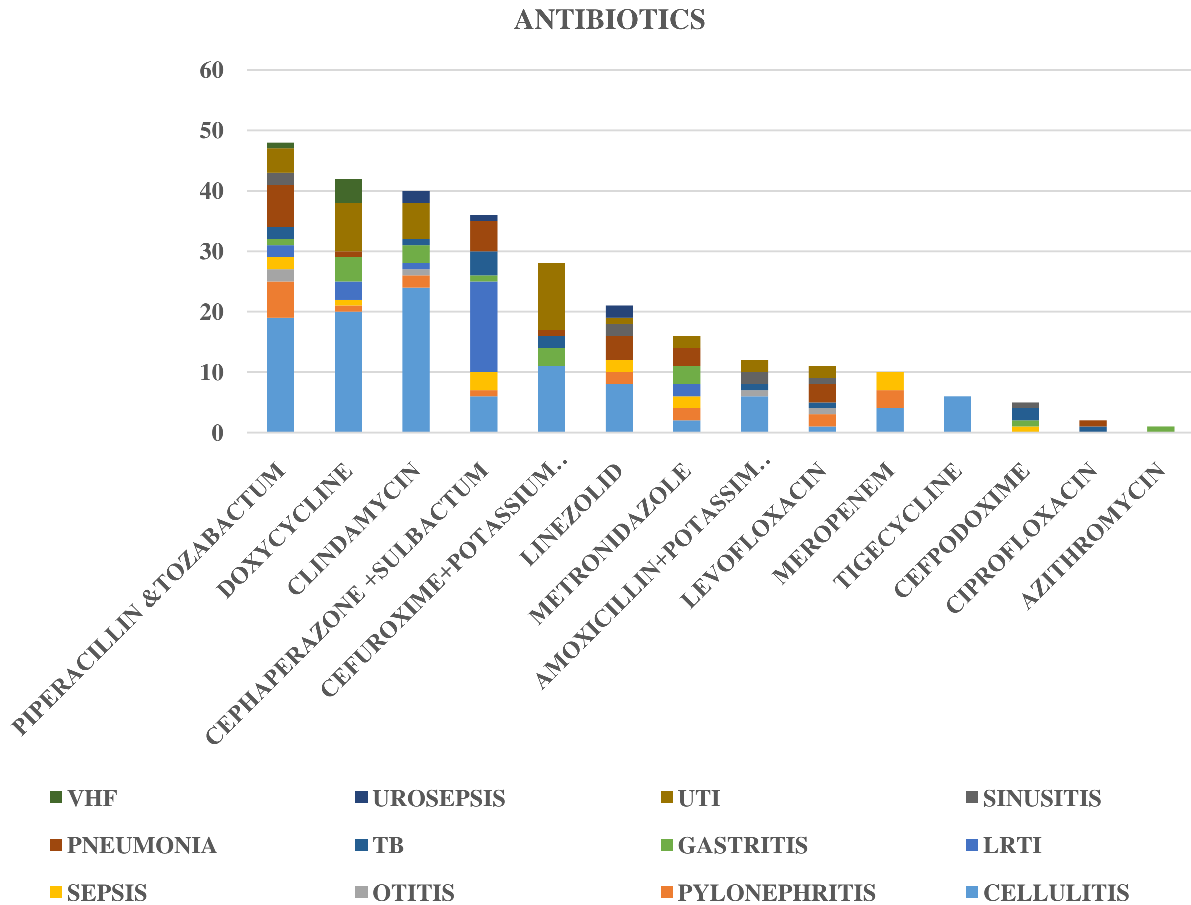

FIGURE:11: No.of Antibiotics prescribed based on infection

INFERENCE: Piperacillin+ Tazobactum are prescribing most frequently based on no.of infections.

CONCLUSION

In our Observational Cross sectional study, among the screened diabetes patients we noticed that, higher incidence of Cellulitis and urinary tract infections10-13. In those patients Piperacillin + Tazobactum antibiotics are prescribed most frequently. Age, Gender, Duration of Diabetes, GRBS, HbA1C, Causative organism were found to be risk factors for the infections in diabetic patients. However, Age, Duration of Diabetes, GRBS, were common risk factors for each infection. This underlines the urgent need of aggressive screening for early detection of infections in diabetic patients and also to prevent or retard the progression of infections as well as to limit or avoid the high risk antibiotics. Apart from medical screening, Educating the patients regarding Lifestyle modifications and diabetes related infections may aid to control the occurrence of infections in Diabetes patients14-16.

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