EVALUATION OF DRUG PRESCRIBING PATTERN AND COST ANALYSIS OF ANTI-DIABETIC THERAPY IN ODISHA

Dissertation Submitted to

The IIHMR University, Jaipur for the
partial fulfillment of the award of the degree
of Master of Business Administration
(MBA) in Pharmaceutical Management by
Subham Kumar Meher

Under the supervision and Guidance of
Rahul Sharma

Declaration by Student

I hereby declare that this dissertation titled **EVALUATION OF DRUG PRESCRIBING PATTERN AND COST ANALYSIS OF ANTI-DIABETIC THERAPY IN ODISHA** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Signature

Name of Student

Subham Kumar Meher

Date: 21st Jun 2022

Certificate

This is to certify that dissertation titled **EVALUATION OF DRUG PRESCRIBING PATTERN AND COST ANALYSIS OF ANTI-DIABETIC THERAPY IN ODISHA** is a record of the research work by **Subham Kumar Meher, Roll no. 0276**, in fulfillment of the requirement for the completion of the degree of MBA (PM) School of Pharmaceutical Management, IIHMR University, Jaipur. under my guidance and supervision and I believe her approach for this study or dissertation has been sincere and analytical.

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Acknowledgements

I'd take this opportunity and thank Rahul Sharma, Associate Professor of Pharmaceutical Management for helping me through my dissertation and providing the necessary guidance, and support, also for being available 24X7. I am very thankful for his honest and insightful views.

I would also like to thank the respondents and the hospital authorities for their valuable responses without whom I would not have been able to complete this report.

At last, I would like to thank HealthArk Insights and my Manager Ritu Baliya,for providing me necessary reports and documents for the research.

Thank You.

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Table of Contents

Contents

List of Figures

List of Tables

List of Graphs

Abbreviations

MODY	Maturity-onset Diabetes of the young
DPP4	Di-peptidyl peptidase 4
SGLT2	Sodium-Glucose co-transporter 2
GLP1	Glucagon-like peptide
K-ATP	Potassium Adenosine Tri-phosphate
T2DM	Type 2 Diabetes Mellitus
OHA	Oral Hypoglycemic Agents
DPCO	Drug Price Control Order

Abstract

Diabetes is a condition which is a metabolic disorder that is characterised along with different co morbidities and requires a lifelong treatment and maintenance of levels of glucose. The drug therapy in diabetes and cost involved in the therapy are scarcely documented in India

An audit of the diabetes therapy was conducted in Bargarh district of Odisha to understand the current diabetes practice and the cost involved in the therapy to the patients. To analyse the prescribing pattern of the drugs. To study the different class of major pharmaceutical drugs, prescribe for diabetes and comorbidities. To access the demographic and about the patient. To know usage of the anti-diabetic medications and rational use of it. To know the cost involved in the therapy. There is a dearth of evidence regarding the drug prescribing pattern among patients and the cost involved in the antidiabetic therapy. Hence it was felt necessary to make an intervention and produce necessary evidence in this area. The research type is both primary and secondary. The study design is descriptive and analytical. The sample are chosen on the basis of random sampling and the study area is Bargarh district, Odisha and the sample size is 110**.** The sample is selected from the different parts of Bargarh district based on prevalence of diabetes. Microsoft excel is used for the analysis of data and the study duration is 3 months. The study suggests the strong domination of OHA over the insulin therapy but as we can see it is increasing respectively and 45% are treated with insulin in the region among that most commonly used insulin is short acting insulin which accounts for 75%. Insulin usage is 45% which is higher in comparison to the previous study in India. Sulphonylureas and biaguanides as still the class of drug for choice which accounts around 35% and 32% respectively and the combination of both the classes of drugs are still used frequently. Increase amount of use of insulin in the Bargarh district of Odisha which accounts for 45% which add a lot of burden in the people's monetary expenditure. This study provides valuable insights on the prescription pattern of the patient with or without comorbities in the diabetes condition and the rational usage of the drugs.

Keywords: *Anti-diabetic Medications, Sulfonylureas, Biaguanides, Insulin Usage, Prescribing Pattern*

1. Introduction

- Diabetes is a condition which is a metabolic disorder that is characterised along with different co-morbidities and requires a lifelong treatment and maintenance of levels of glucose.[i] There is an increase epidemic of type 2 diabetes, and the oral hypoglycaemic agents are still the pharmacological therapy to improve efficacy and long-term complications that arise from the type 2 diabetes.[ii]
- Regardless of the Government attempt to prevent inexcusable price mounting of drugs by incorporating National List of Essential Medicine (NLEM) and by enacting the Drug Price Control Order (DPCO), huge discrepancy in cost of drugs still occur.[iii]
- The pattern of prescription still is used as an important tool to understands the trends in the medication prescription and also provides an idea about the drug usage and the rational use of drugs.[iv]

Diabetes mellitus

Diabetes mellitus (DM) is the oldest know disease which can be found reported in the Egyptian manuscript.[v] It is caused due to hyperglyceamic conditions and is also categorised by different metabolic disorders. It leads to the complications in the fat and carbohydrates metabolism in the body and which leads to different types of comorbid conditions which include both micro and macro vascular disorder.

Diabetes possess a great matter of concern in different ages due to its morbidity and mortality across several age groups and emerged as a public health concern.[vi]

Types

It is characterized by the impairment of the secretion of insulin or the resistance towards it and it is classified into Type1, Type 2 and Gestational diabetes.[vii]

Both subtypes have different physiology, evaluation, and management but lead to the same outcome, i.e., hyperglycemia. Other than that, it is classified based on maturity-onset diabetes of the young (MODY) by:

- Gestational,
- Neonatal
- Steroid-induced diabetes

Diabetes 1 & 2 mainly results from insulin secretion (type 1) and/or insulin action (type 2). Mainly type 1 diabetes occurs in children and adolescents and type 2 diabetes is highly prevalent in middle-aged and older people generally effect by prolonged hyperglycemia due to sedentary lifestyles and dietary choices. Now, Due to the destruction of β-cells of the pancreas, insulin secretion is low or absent in type 1 diabetes, but type 2 diabetes involves variation in insulin levels and sensitivity causing deficiency in insulin secretion in the body resulting in type 2 diabetes, but type 2 diabetes occurs due to many other factors such as obesity. Type 2 diabetes has genetic factors also. The pathophysiology of diabetes is unclear as there are many factors associated with it but a blood glucose level greater than 180 mg/ dL is considered hyperglycemic.

Generally, type 2 diabetes is treated with lifestyle and diet modification (type 1 diabetes occurs due to insulin resistance and no lifestyle change can overcome that) but for severe cases, medications are preferred.[viii] Now, for type 1 diabetes, insulin is the only treatment option. All the patients with type 1 diabetes have to take insulin every day.

For type 2 diabetes there are treatment options such as:

- Insulin: Some the patients have to take insulin in severe cases of type 2 diabetes
- Oral Medications: It is used as a single dose or combinational therapy i.e.,
    - Metformin
    - Thiazolidinediones
    - Sulfonylureas
    - Meglitinide
    - DPP-4 Inhibitors
    - SGLT2 Inhibitors
    - Alpha-glucosidase inhibitors
    - GLP-1 receptor agonists
- Diet & Exercise: This will help you to maintain your blood sugar level in bothtype 1 and type 2 diabetes

Causes

Type 2 diabetes is the most prevalent type of diabetes which accounts for 90% of the diabetes case and is caused either due to the insulin resistance or impairment in the secretion of insulin. Insulin is caused due to increase in lipolysis and excessive production of fatty acids. It is also caused due to the hepatic glucose production and due to the low intake of glucose in the skeletal muscle. It is worsened by the b cell dysfunction. Type 2 diabetes is cased due to lifestyle modifications (excessive calories, inadequate exercise, and obesity) and is also contributed by the genetic factor and family history.

Treatments

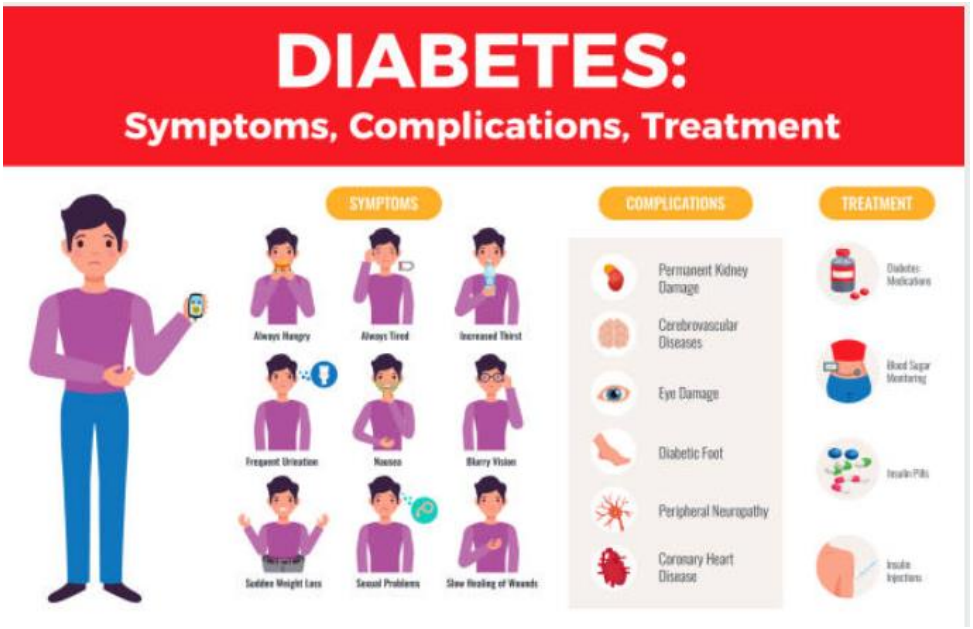


Figure 1: Common Diabetes Treatment, Symptoms and Complication (Source: https://pdb101.rcsb.org/global-health/diabetes-mellitus/monitoring/complications)

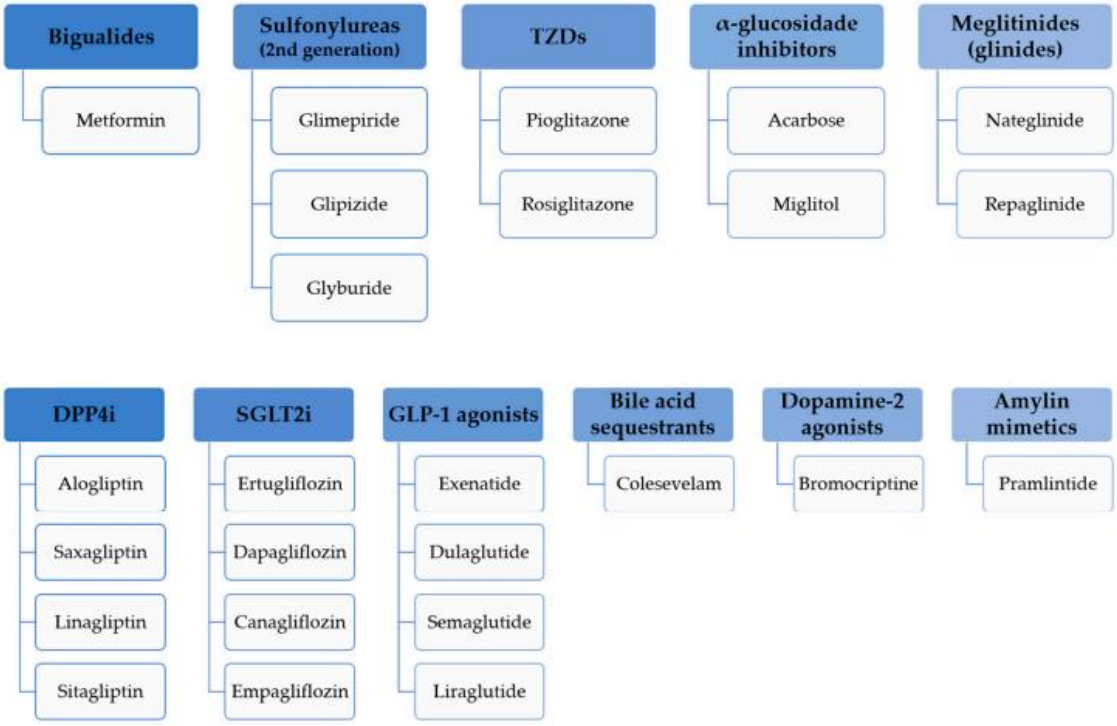


Figure 2: Oral and injectable non-insulin glucose-lowering drugs approved by the American Diabetes Association(Source: diabetes.org)

1.1 Statistics about diabetes:

[ix]Globally, around 0.5 Bn people are suffering from diabetes. Middle-income country shows the highest prevalence of diabetes with Asia as an epicenter of it. India is the diabetic capital in the world. With a diabetic population of 74.2 Mn India is 2nd largest country after China.[x] It is expected to increase by over 134 Mn cases by 2045, from which 57% will remain undiagnosed.

[xi]**Parameters**	**Statistics (2021)**
People with diabetes (new cases)	74195
Prevalence of diabetes (%)	9.6
Undiagnosed people	39400
Undiagnosed people (%)	53
Probability of death due to diabetes	647,831
Diabetes-related death (under 60y) (%)	2.8

Table 1: Diabetes Statistics in India

1.2 Sulfonylureas as a diabetes treatment

A wide variety of oral medications are used to maintain blood sugar levels. Majorly insulin and metformin are used as primary treatment options but sulfonylureas are another treatment option that is preferred for diabetes management. Sulfonylureas are the earliest and most widely used oral hypoglycemic agents to treat diabetes mellitus. It promotes the secretion of insulin from pancreatic cells and maintains blood sugar levels.

Mechanism of Action of Sulfonylureas:

The Sulfonylureas receptor is the K-ATP channel in pancreatic cells which regulates the release of insulin. Now, sulfonylureas bind with the K-ATP channel and inhibit these channels. This alters resting potential and Ca^{+2} influx is increased. This stimulates the secretion of Insulin from the β-cells of the pancreas. Sulfonylureas exhibit effects on other cells than the pancreas, but the clinical importance of that effect is not much. Sulfonylureas are not effective for treating type-1 diabetes as it is insulin- dependent & sulfonylureas act by increasing insulin secretion

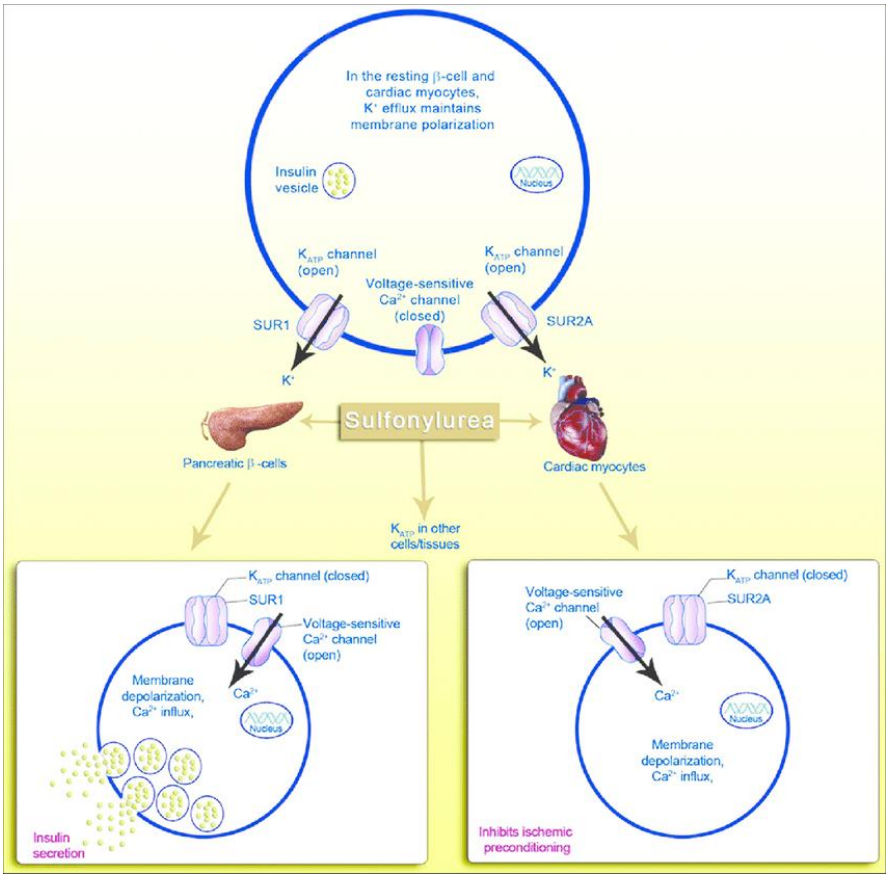


Figure 3: MOA of sulfonylureas on β-cells of the pancreas(Source: Mechanism of action of sulfonylureas on pancreatic β-cells and ... [Internet]. [cited 2022Jul4]. Available from: https://www.researchgate.net/figure/Mechanism-of-action-of-sulfonylureas-on-pancreatic-b-cells-and-cardiomyocytes-SUR_fig1_281576520)

Route of administration of Sulfonylureas:

Oral administration of sulfonylureas as normal and long-acting (extended release) pills of various dosage forms i.e., 0.5, 1, 1.5 & 2 mg taken once daily with breakfast or lunch. It is taken in addition to the diet for sugar control of patients withT2DM. Combinational drug therapy of sulfonylureas is generally preferred for high effectiveness & better onset of action.

Side Effects of Sulfonylureas

Some common side effects of sulfonylureas:		
Diarrhea	Abdominal pain	Muscle pain
Vomiting & Nausea	Weakness	Sore throat
Upset Stomach	Loss of Appetite	

Table 2: Side Effects of Sulfonylureas

2. Research Problem & Objectives

2.1 Research Problem

Diabetes is a chronic disorder that needs ongoing medical attention and patient education on self-management in order to avoid immediate consequences and lower the chance of long-term complications. Due to a lack of access to medical treatment, diagnosis, and testing, people with diabetes living in low socioeconomic categories have lower levels of self-reported diabetes than those living in higher socioeconomic groups. Adherence to any diabetic treatment is influenced by a number of variables, including the expense of the prescription, the intricacy of the regimen, the patient's emotional health, their perception of any adverse effects, and how the medication affects their everyday activities. Sulfonylureas are often given drugs for the longer-term management of T2DM. It is the most widely used and commonly recommended medication for middle-income countries, whether in single-dose or multi-dose therapy. Additionally, the doctors are prescribing different brands along with the anti diabeteics medicication, the usage and accessibility of the medication projects a mammoth problem in India and the rise in prescribing of different additional medication in diabetes leads to the out of the pocket expenditure of the patients

2.2 Research Objectives

The objectives of the research are:

- To analyse the prescribing pattern of the drugs.
- To study the different class of major pharmaceutical drugs, prescribe for diabetes and comorbidities.
- To access the demographic and about the patient.
- To know usage of the anti-diabetic medications and rational use of it.
- To know the cost involved in the therapy.

2.3 Research Questions

- What is Drug prescribing pattern among patients?
- What is the cost involved in the antidiabetic therapy?

3. Literature review

[1]Traditional diabetes medications are causing unwanted adverse effects leading to incompliance and a decline in treatment rate. To increase the compliance of diabetes, many therapies and NCEs are evolving such as β-cell generators and gene therapy alongwith oral hypoglycemic agents to better control this disease. Currently, with the evolution of nanoparticles, new methods of glucose monitoring and insulin supplementsare holding the potential to improve the life of the diabetic patient, but any of these newagents or NCEs are effective alone for better disease control. So, the combination of these new emerging agents with traditional oral anti-diabetic agents is required which will effectively improve the propensity to manage the criticality of the disease. (Vijay Mishra, 2021)

[2]Drug utilisation studies' (DUS) main goal is to encourage the people to use medications responsibly. Drug therapy must be optimised with the use of drug utilisation studies. Medical audit, which attempts monitoring, review, and necessary changes in the prescribing procedures to achieve rational and cost-effective pharmacotherapy, includes the research of medication utilisation or prescribing patterns.

Irrational prescription has a number of negative effects, such as non-adherence to treatment plans, which can lead to difficulties from uncontrolled blood sugar levels as well as higher drug and medical expenses.(Das, Alak & Dutta, Aishwarya & Maitiy(2021).

[3]The prevalence and incidence of diabetes, as well as the significant financial burden of its consequences, are both rising quickly in India. For type 2 diabetes mellitus (T2DM) to be adequately treated in India, an estimated 2.2 billion US dollars would be required. India's future is currently uncertain in light of the possible cost that diabetes can put on the nation.

To make evidence-based health decisions and, as a result, to provide patients with diabetes with the greatest risk- and cost-effective treatment options and improve their quality of life, it is crucial to perform research that concentrate on economic analyses. (Limaye, Dnyanesh & Todi, K. & Shroff, J. & Ramaswamy, A. & Kulkarni, Priyanka & Limaye, Vaidehi & Fortwengel, Gerhard. (2016).

[4]Variable brands of OHA the same Indian-made drug have significantly different percentage costs, and marketing efforts should be focused on increasing therapeutic benefit and reducing unfavourable personal and financial effects. (Gedam, Sanjay & Barmaiya, Namita. (2021). Cost variation analysis of oral anti-diabetic agents available in Indian market. International Journal of Basic & Clinical Pharmacology.)

4. Study Design & Methodology

4.1 Study Design:

Study Type: Descriptive Study and Analytical

Data Source: Primary & Secondary Research

Data Collection Technique/ Tools:

Primary Research: Prescription auditing and interviewing

Secondary Research: Data from different articles and journals

Data Analysis tool: Research Data analysis using excel

4.2 Sample Design:

Research Type: Primary and secondary

Study Design: Descriptive and Analytical

Sampling Method: Non-probability convenience sampling

Study Area: Bargarh District, Odisha

Sampling Size: 110

Sample Selection: The sample is selected from the different parts of Bargarh district on the basis of prevalence of diabetes.

Data Collection: Quantitative Data

Study Duration: 3 Months

4.3 Methods and Materials:

It was a cross sectional study which is conducted in the Bargarh district of Odisha. This study is conducted by collecting prescription from 110 participants and the sample are selected based on random sampling from different parts of Bargarh district and some of the prescriptions are collected from the different hospitals in the regions. Permission from the hospital was taken prior to this study. The sample size of the study is 110. After collecting the data, the drugs used in the treatment and along with the life modifications are being studied.

The following parameters are taken in consideration of the study.

- Categorisation of type of diabetes.
- Average anti-hypertensive drugs prescribed per prescription.
- Which is the commonest and most frequent anti- hypertensive drugs prescribed.
- Cost involved in the medication.

- Prescription is written in either generic or branded form.
- All other medication which are used for comorbidities along with anti-hypertensive therapy.
- To study the dosage duration of sulfonylurea and
- To study the prescription, share of different brands

4.4 Ethical Consideration:

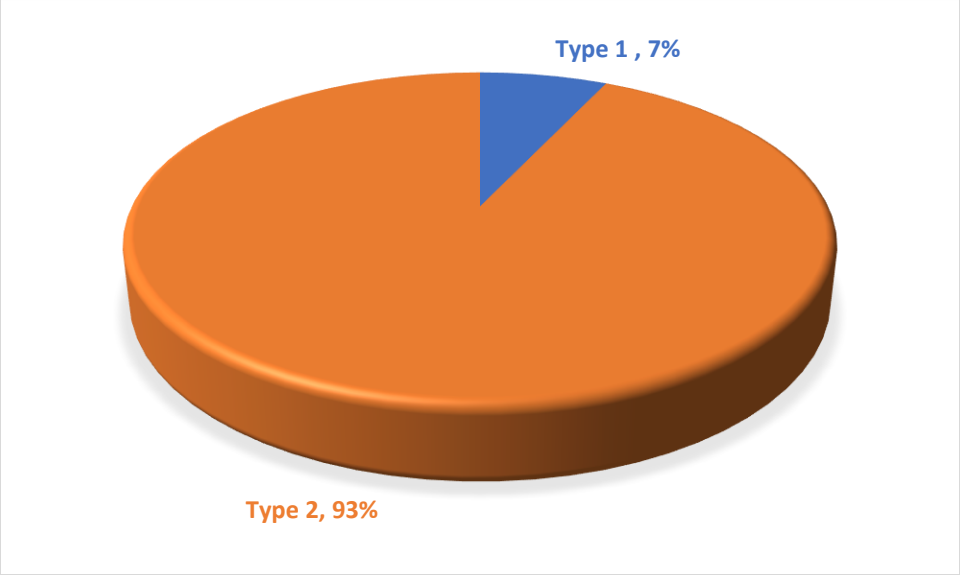
The research was done with appropriate research guidelines and respondents were provided sufficient amount of time for responses. Before research, consent and permission was taken from both the hospitals and the patients. Identity of the respondents was not disclosed. Secondary research was done with reliable and appropriate references

5. Results and discussion:

5.1 Categorisation of diabetes.

Types	No of patients	Percentage
Type 1	8	7%
Type 2	102	93%

Table 3: Categorisation of diabetes type



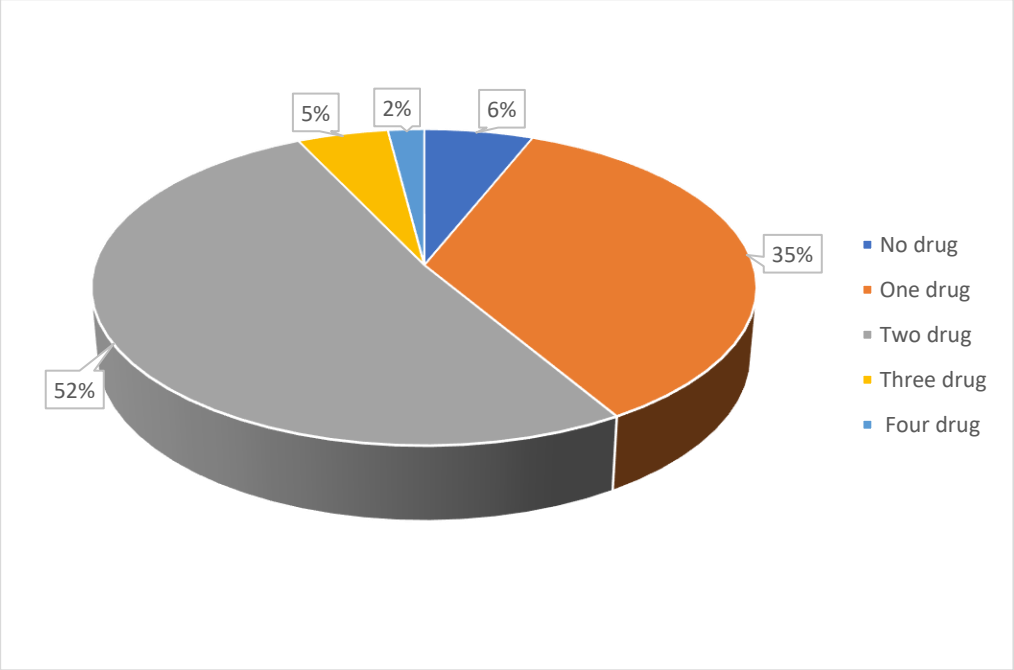
Graph 1: Categorisation and percentage of diabetes type

Among 110 patients that participated in the study. As the graph suggest Type 2 diabetes is the common form of diabetes and accounts for 93 % and there is the less significance of type 2 diabetes which accounts for 7%.

5.2 Distribution as per number of anti- diabetics drugs in the prescription.

Number of anti-diabetic drug in a prescription	Number of patients prescribed	Number of encounters (%)
No drug	7	6%
One drug	39	35%
Two drugs	56	51%
Three drugs	6	5%
Four drugs	2	2%

Table 4: Percentage of number of drugs prescribed to patients



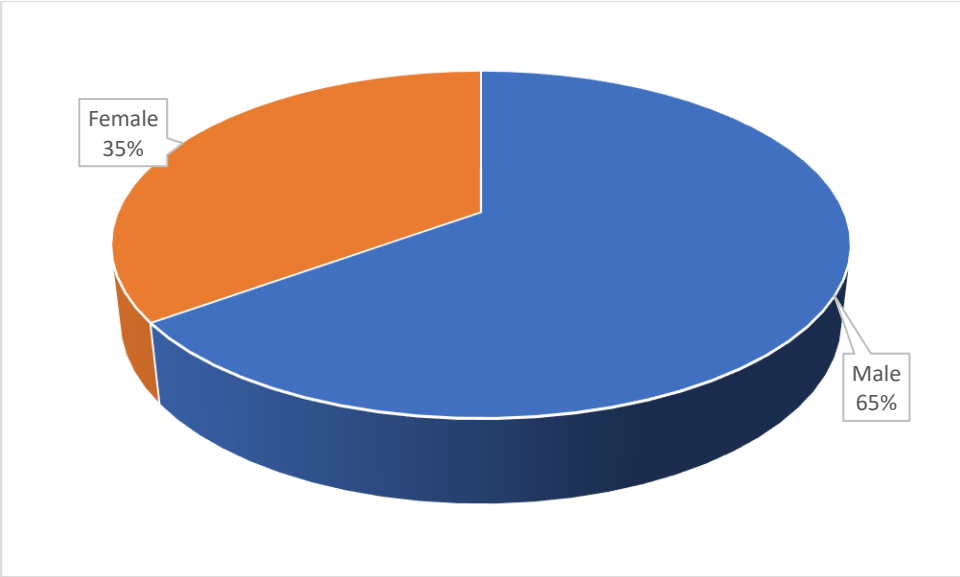
Graph 2: Categorisation and percentage of number of drugs prescribed to patients

Among the different prescription prescribed it suggests that the usage of one or more anti-diabetic drugs are used. This also shows the usage of combination drugs therapy in comparison to the mono therapy used in diabetes. From graph 2, it can be seen that the two drugs combination are used more as in comparison to mono therapy.

5.3 Distribution based on Gender.

Gender	Participants	Percentage.
Male	72	65%
Female	38	35%

Table 5: Percentage of gender wise distribution of diabetic patients



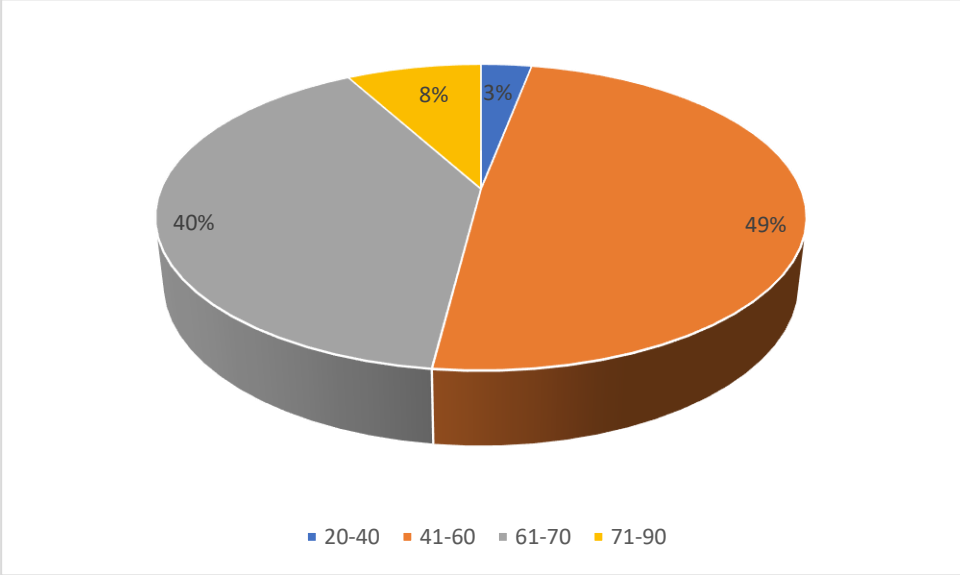
Graph 3: Categorisation of Gender wise distribution of diabetic patients

Among the 110 participants 65% male have diabetic conditions and 35% female i.e. 38 have diabeteic condition in the study sample which signifies the prevalence of diabetes is more in male as comparison to female population

5.4 Distribution based on Age.

Age (in years)	Participants	Percentage
20-40	3	3%
41-60	54	49%
61-70	44	40%
71-90	9	8%

Table 6: Percentage of Age wise distribution of diabetic patients



Graph 4: Categorisation of Age-wise distribution of diabetic patients

Among the majority of participants, the prevalence of diabetes is more in the age group 41-60 i.e. 49% and the least prevalence of diabetes is in the age group 20-40.

5.5 Family history of diabetes patients.

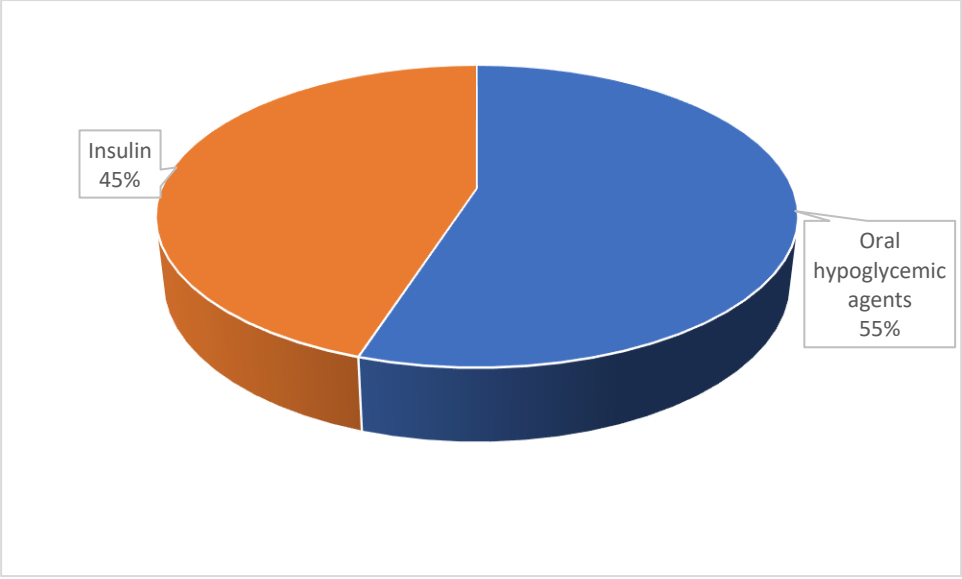
History of Type 2 DM	Participants	Percentage
Yes	41	37%
No	57	52%
Not significant	12	11%

Table 7: Percentage split of family history of diabetes

Genetic factor plays a major role in diabetes so number of patients who have family history of diabetes is 37% as comparison to person who do not have family history of diabetes i.e. 52% and 11 % people don't know about their family history of diabetes.

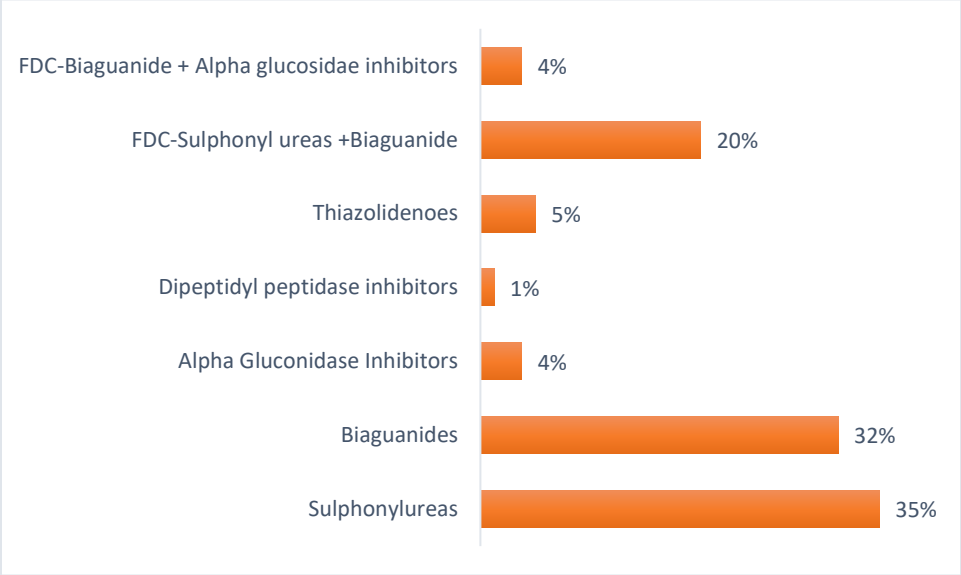
5.6 Prescribing pattern of anti-diabetic therapy.

The number of anti-diabetic drugs which are prescribed per prescription was between 1 to 4 drugs. 150 anti-diabetic drugs were prescribed. Out of 150 anti-diabetic drug products oral hypoglycaemic drugs 55% is treated with OHA and 45% are treated with insulin. Thus, OHA is the most prescribed drugs therapy in the study.



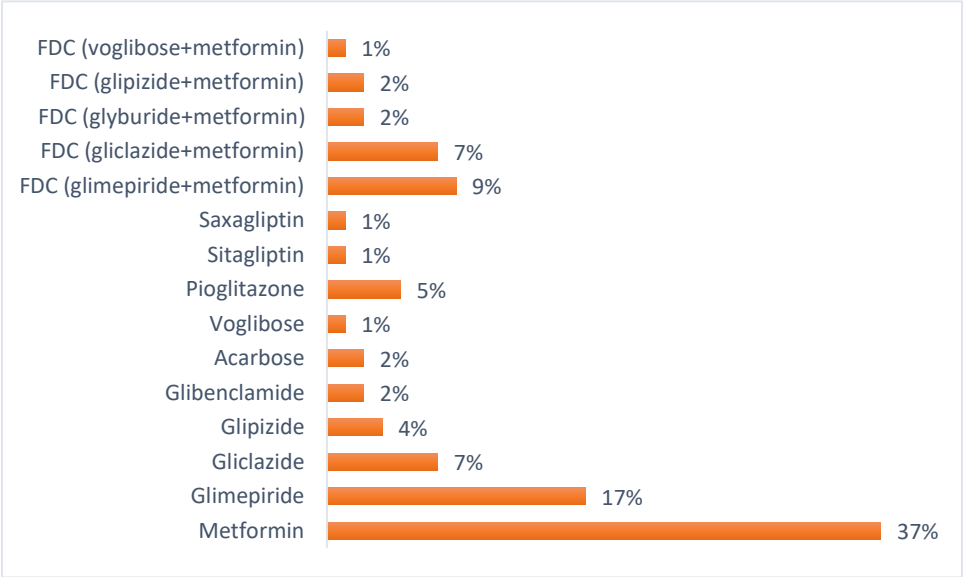
Graph 5: Categorisation of OHA and insulin usage

Among the different class of oral hypoglycemic agents, Sulphonylureas are most commonly used as in the graph 6 it suggests that sulfonylureas are used in more prevalently i.e. 35% followed by biaguanides and then the FDC of sulfonylureas and biaguanides i.e. 20%.



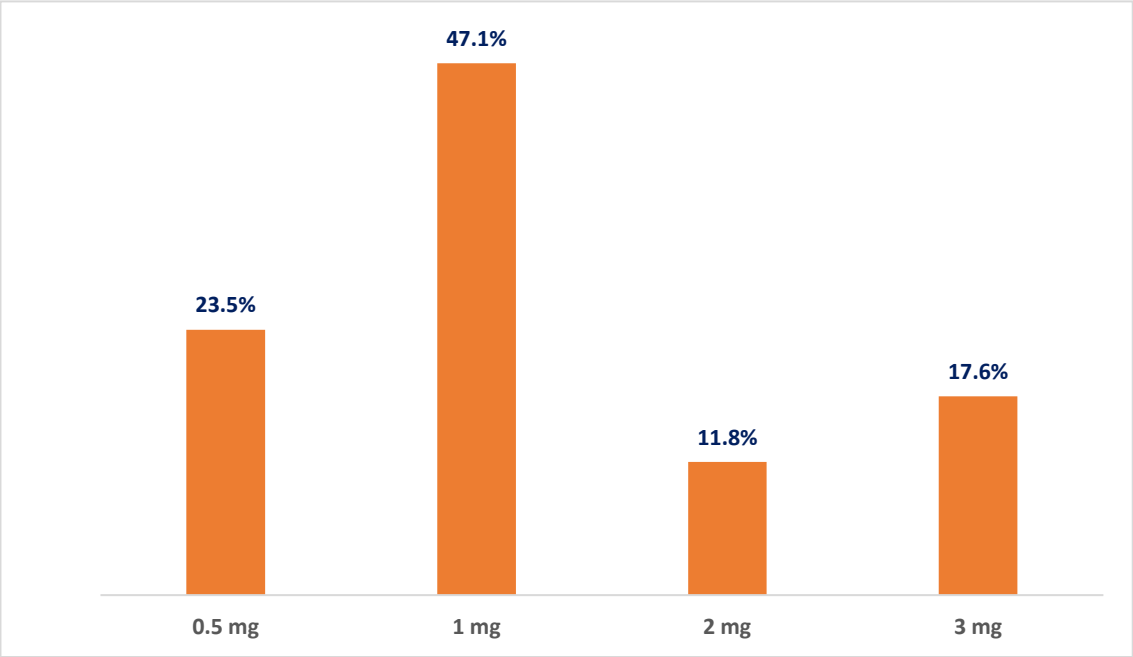
Graph 6: Prescribing pattern of different class of OHA

Metformin is the most commonly prescribed drug molecule in antidiabetic therapy and it can be seen from graph 7 i.e. 37% following that glimepiride is prescribed more frequently and the combination of both two glimepiride and metformin is the drug of choice in FDC.



Graph 7: Prescribing frequency of different oral hypoglycemic agents

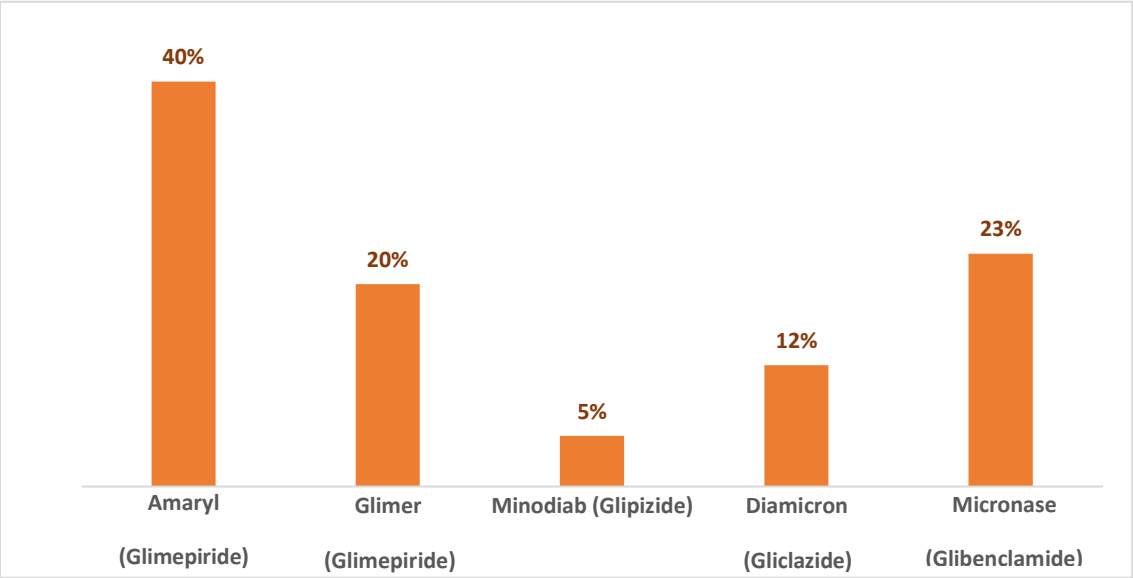
5.7 Dosage Distribution of Sulfonylureas



Graph 8: Prescribing pattern of different strengths of Sulfonylureas

Dosage distribution from the survey shows that 1 mg dose of any sulfonylureas was prescribed the most as majorly the prescriptions were combinational therapy. For the severe cases in which blood sugar level was not controllable, a high dose is prescribed as the daily limit of sulfonylureas was a maximum of m 6 mg for severe cases. It is found that a 0.5 mg dose of sulfonylureas was prescribed for maintenance therapy. Other than that, the dose of the drug is primarily depended upon the severity of the disease.

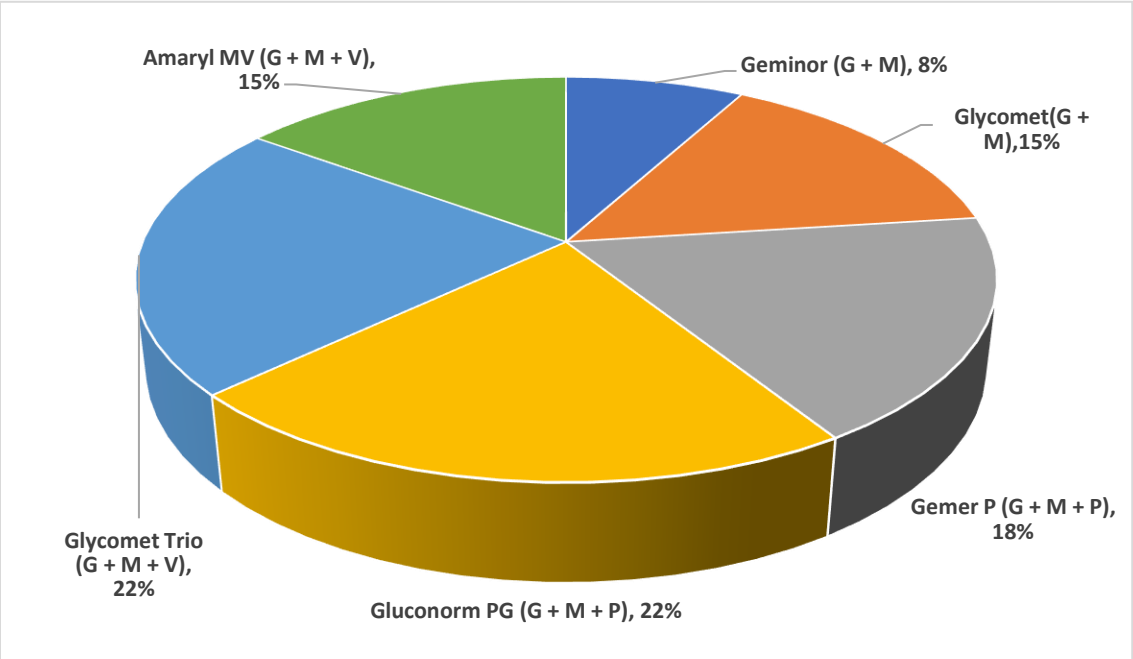
5.8 Brands and its share



Graph 9: Top Brands and its prescription share (Single Dose Therapy)

For Single Dose therapy:

As per the survey, it is found that Amaryl i.e., Glimepiride of Sanofi Pharmaceuticals has the highest generation of prescriptions (40%). It has 4 SKUs. Glibenclamide single dose therapy of Pfizer pharmaceuticals named Micronase has a prescription generation of 23% i.e., second highest prescribed brand. Another Glimepiride brand named Glimer of Abbott Pharmaceutical has a prescription share of 20%.

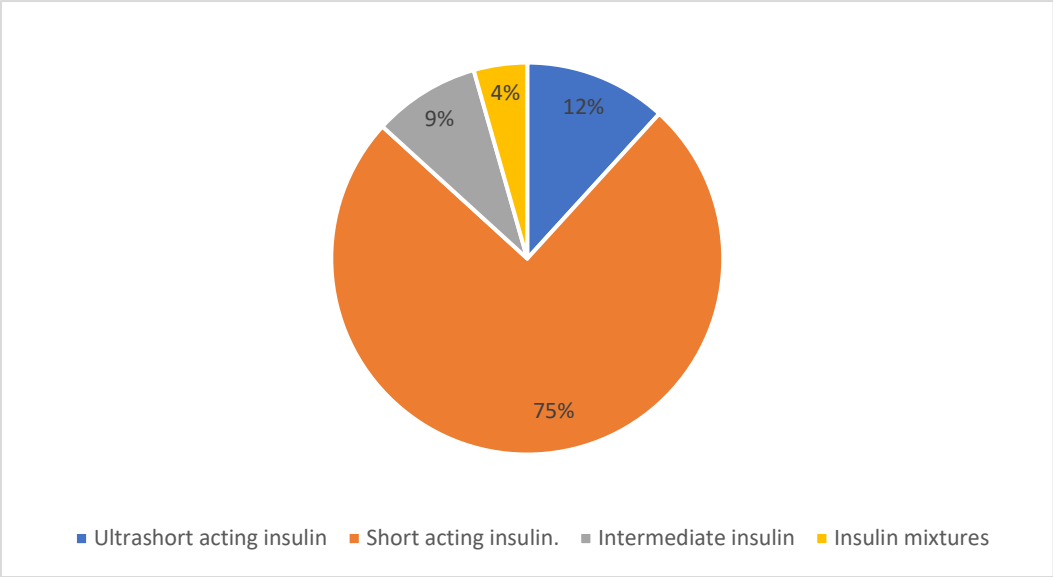


Graph 10: Top Brands and its prescription share (Combinational Therapy)

For Combinational Therapy:

As per the survey, it is found that Glycomet from USV limited a has 15% prescription share e for the Metformin + Glimepiride combination. Among all the brands, Glycomet Trio of USV Limited is a combination of Metformin + Glimepiride + Viglibose and Gluconorm PG of Lupin Limited the highest prescription share in combination therapy i.e., 22%.

5.9 Frequency of different class of Insulin Used



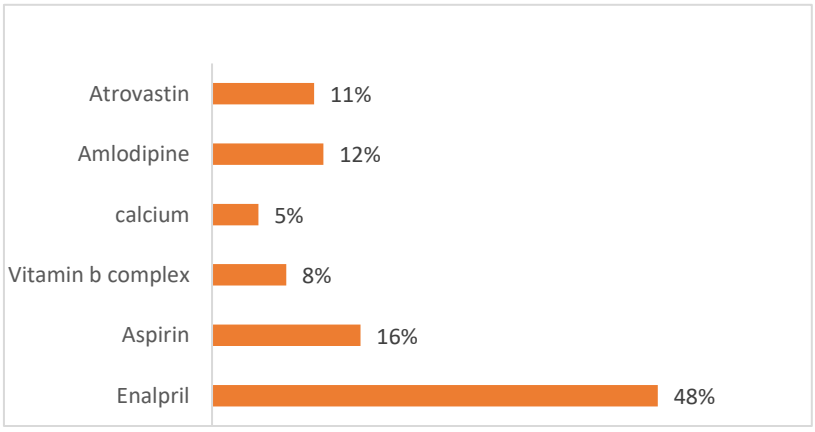
Graph 11: Percentage Usage of different class of insulin

As per the survey suggest that short acting insulin covers the largest share in the insulin market i.e. 75%.

5.10 Branded vs Generic drugs Share of anti diabetic therapy

The percentage of branded drugs prescribed under this study is around 96% and the generic drugs were only prescribed in 4% Which is very less.

5.11Prescribing pattern of drugs of comorbid conditions



Graph 11: Percentage of Prescribing pattern of drugs of comorbid conditions

In the study the commonly prescribed medications for comorbid conditions is Enalpril which have a 48% prescribing pattern followed by aspirin and then amlodipine which is 16% and 12% respectively as suggest in the graph number 11.

5.12 Health economics of diabetes

The spending on health in India by the government is less as compare to the different developed countries. In India private health care is predominant and government set up provide around 20%of care in India.

In India the out of pocket expenditure for diabetes is catastrophic and is accounted by 10% household consumption in 45% Patients and 23% takes loan to meet this out of pocket expenditure.

There is a significant increase in the price of antidiabetic therapy [xii]

Years	Price hike(rupees)
Less than 5 years	5.44 to 7.45 per day
Between 5 to 10 years	9.5 to 24 .23per day
Between 10 to 15 years	12.69 to 52.12
More than 15 years	17.50 to 63-78

Table 8: Price hike of antidiabetic therapy over years

The cost of therapy increased due to the different comorbidities and the use of insulin and the private health care. As also we can see the increase amount of use of insulin in the Bargarh district of Odisha which accounts for 45% which add a lot of burden in the people's monetary expenditure. The direct expenditure of diabetes medication increased by37% between 1998 and 2005 and the mean duration of diabetes was estimated to be 10.4 years and on comparing the direct population direct cost has increased up to 266%. [xiii]

6. Discussion

According to the results obtained the cases and the number of patients of type 2 diabetes is more in comparison to the type 1 diabetes and the increasing percentage of type 2 diabetes is alarming situation in Bargarh district. The percentage of male diabetic condition is more than female diabetic condition i.e. 65% and 35% which can be attributed to the lifestyle. In the above study we can find out more than one drug molecule is given combination of drugs are prescribed unless the use of monotherapy.

As the study suggest the prevalence of diabetes increase between 41-60 which suggest they develop diabetes in the most productive year due to life style modifications and stress. The study suggests the strong domination of OHA over the insulin therapy but as we can see it is increasing respectively and 45% are treated with insulin in the region among that most commonly used insulin is short acting insulin which accounts for 75%. Insulin usage is 45% which is higher in comparison to the previous study in India.[14] This suggest a change in drug prescribing pattern and shifting towards the Insulin therapy in comparison to the OHA therapy. In this study a large percentage of drugs are prescribed in brand name i.e. 96% Which suggest the high awareness of brand name within physician and the use of generic drugs are less which add in the increase in cost burden of the patient. It is generally advisable to prescribe in the generic names due to cost utilisation.

The study suggests dominant use of Sulphonylureas and biaguanides as still the class of drug for choice which accounts around 35% and 32% respectively and the combination of both the classes of drugs are still used frequently. This suggest that Sulphonylureas and biguanides are still the choice of treatment with in the physician. Despite of the use of Sulphonylureas metformin(biaguanide) is the most common used drugs by the prescriber it prescribes frequency is 37% which is higher than the other molecules of the drugs in the study.

The different types of comorbidities which results from the diabetes a class of antihypertensive, cardiovascular, antibiotic therapy are suggested. As from the above study we can find out the use of enalapril and aspirin followed by atorvastatin and amlodipine, which suggest that most of the patients is on polypharmacy so they should be educate well and the interactions between the different class of drugs should be avoided for the rational use of drugs.

7. Limitation of the study

It is a pilot study which is conducted in the district of Bargarh by taking different prescriptions and interviewing the patients about their diabetes condition. It is conducted in a duration of 3 months in 110 diabetic patients.

8. Conclusion

The present study analyses the drug prescribing pattern in the Bargarh district and the different cost that are involved in the maintenance of the diabetes. Oral hypoglycemic agents are still dominate but the usage of insulin therapy increased over the period of time which suggest the change in shift in the prescribing pattern. It also studies the prescription pattern of the patient with or without comorbities in the diabetes condition and the rational usage of the drugs. The study suggests the use of polypharmacy which is due to the different kind of comorbidities condition in the diabetes. To avoid the irrational use of drugs the other drugs usage should be minimised. Due to the polypharmacy and the use of branded generics in the prescription it leads to the increase in the cost of prescription and leads to the out of pocket expenditure of the patient which should be avoided to lessen the out of pocket expenditure of medication in the patients.

Among the different class of oral hypoglycemic agents Sulphonylureas are most commonly used as in the graph 6 we can show that Sulphonylureas are used in more prevalently i.e. 35% followed by biaguanides and then the FDC of sulphonyl ureas and biaguanides i.e. 20%.

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