

**MARKET ASSESMENT OF ORAL AND INJECTABLE
ANTIDIABETIC DRUGS**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

in

Pharmaceutical Management

by

Nikunj Parwal

Under the Supervision and Guidance of

Mr. Rahul Sharma

Assistant Professor, School of Pharmaceutical Management,

IIHMR University, Jaipur-302029

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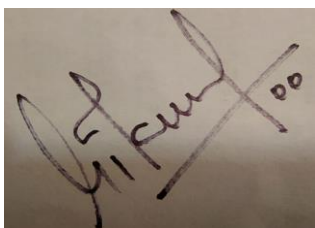
Assistant Professor, School of Pharmaceutical Management,

IIHMR University, Jaipur-302029

2021

DECLARATION BY STUDENT

I hereby declare that this dissertation titled “**Market Assessment of Oral and Injectable Antidiabetic drugs**” 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.

A handwritten signature in dark ink, appearing to read 'Nikunj Parwal', with a stylized flourish at the end.

Nikunj Parwal

Date: 02-07-2021

CERTIFICATE

This is to certify that dissertation titled “**Market Assessment of Oral and Injectable Antidiabetic drugs**” is a record of the research work undertaken by **Nikunj Parwal** in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.

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ABSTRACT

The oral antidiabetic medicine industry segment is extremely competitive and fragmented, causing several problems for consumers; thus, researches are necessary to have a deeper knowledge and assessment of the Oral Antidiabetic market. Diabetes is a major established risk factor for renal and eye problems. Diabetes treatment is continuously developing in response to new information published on a regular basis, and an excess of new medicines are being added at a quick rate. There has been a shift in the medicines administered, because of their positive impact on lowering underlying comorbid disorders. Outdated medicines are being phased out in favor of newer, more effective treatments with fewer adverse effects. As a result, this research focuses on the market estimation and growth of Oral antidiabetics, as well as the assessment of new competitors in the same segment. For conducting the research a well-defined questionnaire was prepared for the survey where the target audience were the dispensing pharmacists. They were requested to respond to the questions and their responses were finally recorded digitally. A graphical analysis was performed on the responses obtained, following that the conclusion was framed.

Keywords- Antidiabetic drugs, cost effectiveness, market, competitive landscape, brands, oral and insulin based antidiabetic drugs.

ACKNOWLEDGEMENT

As a Master's program student, I feel privileged and grateful in taking this opportunity to express my gratitude to many people who have contributed to the completion of this project.

First and foremost I would like to thank the Almighty God, whose grace has been throughout the dissertation work.

I am very much thankful to Dr. SAURABH BANERJEE (Dean, School of Pharmaceutical management, IIHMR University, Jaipur) for allowing us to carry out the dissertation project. I would like to express my deepest gratitude to my faculty guide Mr. RAHUL SHARMA (Assistant Professor, School of Pharmaceutical Management, IIHMR University, Jaipur) for providing continuous support, guidance, motivating mentorship and sharing a vision and providing me the opportunity for bringing the initial ideas to accomplish the dissertation project.

I extend my sincere thanks to the entire faculty of School of Pharmaceutical Management and non-teaching staff for their generous help.

I am also thankful to the Doctors and the Pharmacists for their cooperation in filling out the form and collection of responses thereby providing me a friendly environment which made me very comfortable to carry out the project further.

I am immensely thankful and express my gratitude to be the student of (IIHMR) Indian Institute of Health Management and Research, Jaipur for facilitating the conduction of this project work. Last but not the least I would like to thank my parents and friends for their constant support.

"Learning the art of expressing gratitude will force you to focus on the positive."

Nikunj Parwal

(Roll No. 0194)

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LIST OF ABBREVIATIONS

Abbreviations	Meaning
CAGR	Compounded Annual Growth Rate
CV	Cardiovascular
DKA	Diabetic Ketoacidosis
DM	Diabetes Mellitus
GAD65	Glutamic Acid Decarboxylase
GDM	Gestational Diabetic Mellitus
Hb1Ac	Glycated Haemoglobin
HIP	Hyperglycemia in pregnancy
IAA	Insulin Auto Antibodies
ICAs	Antibodies to Islet Cell
IDF	International Diabetes Federation
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
IPR	Intellectual Property Rights
R&D	Research and Development
T2DM	Type 2 Diabetes Mellitus

1. Introduction:

Diabetes mellitus (DM) is perhaps one of the oldest diseases in mankind. It was first mentioned around 300 decades ago in an Egyptian text (Awad.M.Ahmed, 2002). A diverse collection of metabolic illnesses marked by chronic hyperglycemia caused by insufficient or impaired insulin production, insulin action, or both is known as Diabetes Mellitus (DM). The significance of insulin as an anabolic hormone causes metabolic irregularities in glucose, lipids, and proteins (Kharroubi & Darwish, 2015).

Diabetes mellitus has reached pandemic proportions. Except for gestational diabetes, early detection of diabetes and prediabetes is critical using established haemoglobin A1c (HbA1c) criteria. (Kharroubi & Darwish, 2015). In 2011, around 360 million individuals were predicted to suffer with diabetes; by 2030, that number will surge to around 550 mn. Each and every nation is observing a rise in the number of individuals with T2DM, with 80 percent of those who are affected are inhabitants in poor and working class countries. In 2011, Diabetes mellitus claimed the lives of 4.6 million inhabitants. (Olokoba, Obateru, & Olokoba, 2012).

The most common reasons for T2DM, a disease spectrum originating from tissue insulin resistance and progressing gradually to a state characterized by complete loss of pancreatic secretive activity of beta cells, are found by impaired insulins secretion, tissue action resistance or combination of both. T2DM contributes significantly to the extremely substantial growth in the rate of non-communicable illnesses affecting industrialized and emerging countries. (Chaudhury, 2017)

Patients are at serious risk for long-term macro- and microvascular issues as a result of the severe metabolic instability associated with this disease, which can lead to recurrent hospitalizations and consequences, including a higher risk of heart disease if not treated properly. (Team, 2015)

Besides that, prediabetes, also known as impaired fasting glucose (IFG), is a state in which the fasting blood sugar level is higher than normal but not high enough to be considered diabetes (110–126 mg/dL). It makes patient susceptible to diabetes, insulin resistance, and a

greater risk of cardiac (CV) and neural dysfunctions. (Standards of medical care in diabetes, 2014)

1.1.Classification of Diabetes Mellitus:

1. Type 1 Diabetes:

Immune mediated: This kind of diabetes is a consequence of the cell-mediated autoimmune destruction of β -cells of the pancreas, which accounts for just 5–10 per cent of diabetes previously referred to as insulin-dependent diabetes, type 1 diabetes and juvenile-onset diabetes. (Diagnosis and Classification of Diabetes Mellitus, 2010) Antibodies to the islet cell (ICAs), glutamic acid decarboxylase (GAD65), tyrosine phosphatases IA-2 and IA-2b, ZnT8, and insulin auto-antibodies (IAAs) are all markers of immunological degradation of the β - cell. When fasting hyperglycemia is first discovered, one or more of these autoantibodies are found in 80-85 percent of people. (Solis-Herrera, Triplitt, & Reasner, 2000). In some persons (primarily newborns and kids) the speed of β -cell breakdown in this form of diabetes is extremely variable and slow in others (mainly adults). In certain individuals especially notably infants and adults, ketoacidosis may be the earliest sign of the condition. Others have moderate fasting hyperglycemia which, if exposed to infection or other triggers, can move swiftly towards serious hyperglycemia

Idiopathic diabetes: Type 1 Idiopathic variants DM often majorly come from Africa or Asia. There is an irregular threat of diabetic ketoacidosis (DKA) based on their differing low insulin concentration in the bloodstream (Diagnosis and Classification of Diabetes Mellitus, 2010)

2. Type 2 Diabetes:

This kind of diabetes, which affects 90–95 percent of people with diabetes and was previously known as non–insulin-dependent diabetes, type 2 diabetes, or adult-onset diabetes, is characterized by insulin resistance and relative inadequacy of insulin. (RA, 1997) Although the plasma insulin level (both fasting and meal-stimulated) is usually raised in absolute terms, it is inadequate to sustain optimal glucose regulation "relative" to the degree of insulin resistance. (M & RA, 2008) The large percentage of individuals with diabetes of this sort are obese and fat promotes resistance to insulin. A greater percentage of

body fat located mostly in the abdomen may be present in patients who do not match the conventional criteria of obesity. Ketoacidosis is unlikely to occur with this kind of mellitus, and if it does occur, it's generally due to the stress of another condition, such as an infection. Because hyperglycemia develops slowly and is frequently not severe enough for the patient to notice any of the typical symptoms of diabetes in its early stages, this kind of diabetes can go undetected for years.

According to a report issued in 2013 by the International Diabetes Federation (IDF), the prevalence of diabetes all over the world in adults (21-80 years old) was 8.3% (382 million people), the large proportion comes under the ages of 40 and 60 years, and the number is expected to rise beyond 590 million by 2030, with a 10 percent global prevalence. (Aguiree, 2013). The main causes of type 2 diabetes are genetics and lifestyle choices. (Cynthia M Ripsin, 2009) A variety of lifestyle activities have been linked to the rise of type 2 diabetes such as lack of physical activity, a lack of exercise, smoking tobacco, and excessive alcohol consumption. (F B Hu, 2001)

1.2.India Diabetes Report (2010-2045):

Table1.1: Diabetes Report of India:-2010-2045 (Federation, 2019)

At a glance	2010	2019	2030	2045
Diabetes estimates (20-79 y)				
People with diabetes, in 1,000s	50,768.30	77,005.60	1,00,956.40	1,34,239.30
Age-adjusted comparative prevalence of diabetes, %	7.8	10.4	11.2	11.5
People with undiagnosed diabetes, in 1,000s	-	43,869.00	-	-
Proportion of people with undiagnosed diabetes, %	-	57	-	-
Impaired glucose tolerance (IGT) estimates (20-79 y)				
People with IGT, in 1,000s	39,471.80	25,207.30	32,158.00	40,703.40
Age-adjusted comparative prevalence of IGT, %	5.7	3.3	3.5	3.6
Mortality attributable to diabetes (20-79 y)				
Deaths attributable to diabetes	10,07,642.00	10,10,262.10	-	-
Proportion of diabetes-related deaths in people under 60 y, %	-	50.5	-	-
Type 1 diabetes estimates in children and adolescents				
New cases of type 1 diabetes (0-14 y), in 1,000s	15.7	15.9	-	-

New cases of type 1 diabetes (0-19 y), in 1,000s	-	19.7	-	-
Type 1 diabetes (0-14 y), in 1,000s	97.6	95.6	-	-
Type 1 diabetes (0-19 y), in 1,000s	-	171.3	-	-
Hyperglycaemia in pregnancy (HIP) (20-49 y)				
Live births affected by HIP	-	60,13,834.90	-	-
Prevalence of gestational diabetes mellitus (GDM), %	-	28.5	-	-
Live births affected by other types of diabetes first detected in pregnancy	-	3,15,256.30	-	-
Live births affected by other types of diabetes detected prior to pregnancy	-	2,38,116.20	-	-
Diabetes-related health expenditure				
Total diabetes-related health expenditure, USD million	2,815.10	7,057.40	8,894.60	10,972.70
Total diabetes-related health expenditure, ID million	7,819.90	27,205.00	34,287.30	42,298.10
Mean diabetes-related health expenditure per person, USD	55	91.7	-	-
Mean diabetes-related health expenditure per person, ID	154	353.3	-	-
Demographics				
Total adult population (20-79 y), in 1,000s	7,13,498.40	8,59,956.10	10,18,183.50	11,59,222.30
Population of children (0-14 y), in 1,000s	3,74,809.00	3,69,543.90	-	-
Population of children and adolescents (0-19 y), in 1,000s	-	4,95,127.80	-	-
Complications of diabetes				
Microvascular	Nephropathy: 5.9%			
	Retinopathy: 0.8%			
	Neuropathy: 10.6%			
Macrovascular	Coronary artery disease: 2.5%			
	Cerebrovascular disease: 0.3%			
	Peripheral artery disease: 0.0%			
	Heart failure: 0.2%			

Table 1.1 continued

In the year 2020, the Indian diabetes market is worth almost USD 1,957 million. Between 2021 and 2026, the market is predicted to increase at a CAGR of 16.5 percent, reaching a valuation of around USD 4,892.7 million.

The growing knowledge and awareness among customers about the signs of diabetes and its negative health consequences is driving the Indian diabetes market, which has resulted in a significant increase in diagnostic and medication treatment rates. Diabetes sector growth in India is also being aided by increased urban growth and developing healthcare infrastructure. Furthermore, the expansion of pharmaceutical contract manufacturing, the emergence of new technologies and low-cost medication manufacture have all helped to expedite the diabetes industry's rise in the country. Nevertheless, in the future year, market expansion may be hindered because of expensive R&D costs, technical advances that outdates the existing medications, rigorous pricing policies, price control, Intellectual Property Rights (IPR) protection and quality control regulatory clearances. (Expert Market Research)

1.3. Background and Rationale:

The oral antidiabetic medicine industry segment is extremely competitive and fragmented, causing several problems for consumers; thus, researches are necessary to have a deeper knowledge and assessment of the Oral Antidiabetic market. Diabetes is a major established risk factor for renal and eye problems. Diabetes treatment is continuously developing in response to new information published on a regular basis, and an excess of new medicines are being added at a quick rate. There has been a shift in the medicines administered, because of their positive impact on lowering underlying comorbid disorders. Outdated medicines are being phased out in favor of newer, more effective treatments with fewer adverse effects. As a result, this research focuses on the market estimation and growth of Oral antidiabetics, as well as the assessment of new competitors in the same segment.

2. Literature Review:

As can be seen from the International Diabetic Federation's worldwide map image of diabetes (<http://www.diabetesatlas.org/>), Type 2 diabetes mellitus (T2DM) is a global epidemic. Diabetes mellitus is a severe metabolic disease defined primarily by hyperglycemia that progresses, and is not entirely understood. The most frequent reasons for the physiopathology of T2DM, a spectrum of disease originated from tissue-insulin resistance and progressively advancing to the state characterized by total lack of secretion activity in pancreatic beta cells are thought to be improper insulin secretion, tissue resilience, or a combination of both. T2DM contributes significantly to the enormous increase in non-communicable illnesses in industrialized and emerging countries. This brief review seeks to describe the current management concepts for the reduction of T2DM high blood glucose, which include the spectra of medicines presently being utilized for pharmacological control. (Chaudhury, 2017).

In terms of diagnostic criteria, pathophysiology, and genomics, several classifications of Diabetes mellitus, their types are compared. In recent years several notable researchers and research organizations in the field of biomedicine have paid close attention to the molecular genomics of diabetes. A wide range of mutations and single nucleotide polymorphisms (SNP) in genes which have an important function in different stages and processes in the breakdown of carbohydrates and in the formation, regulation and function of pancreatic cells at different levels are investigated. In comparison to the prior understanding in this subject, the main breakthroughs in molecular understanding of diabetes in connection to distinct kinds of diabetes are briefly examined here. The mechanism of diabetes progression and complications has yet to be fully understood despite the gathering of substantial evidence at both molecular and cellular levels. More study is clearly necessary in this sector, which will focus on the ultimate goal of improving diagnoses, therapy and limiting the likelihood of developing chronic problems. (Kharroubi & Darwish, 2015).

DM type 2 is mostly attributable to lifestyle and hereditary factors. Several variables in lifestyles are recognized to be significant for developing Type 2 DM. (Olokoba, Obateru, & Olokoba, 2012). In this study to assess the influence of lifestyle activities in Diabetes they

investigated 84,941 women nurses were tracked, free of cardiovascular disease, diabetes and cancer on the basis of diagnosis in the base line. Diet and lifestyle information was regularly updated. In conjunction with five factors, a low-risk category was defined: Body mass index below 25; high grain fiber and unsaturated fat and less trans fat and glycemic stress diet- this impacts the blood sugar effect as a result of diets; adequate to high body exercise of at least 30 minutes a day; non-current smoking; and a daily average consumption of a minimum of a half alcohol content. The most powerful determinant of diabetes was overweight or obesity. Avoiding exercise, poor nutrition, ongoing cigarette smoking were all related to a substantial rise of diabetes risk, even following body mass index correction. In the low-risk category (3.4% of women) there was a proportional risk of diabetes of 0.09 compared to the remainder of the cohort. Total 91 percent of cases of diabetes may be ascribed to routines and types of behaviour not compliant with a low-risk pattern in this cohort. (Hu, Manson, & Stampfer, 2001).

In another study researchers assessed in identifying and investigating the cluster implications and results of Type 2 diabetes among Asian Indians. We picked around 19,000 participants with T2DM (aged 10–95 years) with diabetes tenure of less than 5 years before meeting of first doctor's visit from a channel of 50 diabetes facilities across nine Indian states and performed k-means clustering utilizing dependent indicators: age at during diagnostic test, BMI, waist size, glycated haemoglobin, serum triglycerides, serum high-density lipoprotein, and serum high-density lipoprotein. This was subsequently confirmed in a nationwide epidemiologic studies data collection containing representative individuals from 15 Indian states. Cluster 1 (Severe Insulin Deficient Diabetes SIDD), Cluster 2 (IRDD Insulin resistant diabetes), cluster 3 (Combined Insulin Resistant and Deficient Diabetes, CIRDD) and Cluster 4 (Mild Age-Related Diabetes, MARD), researchers found four patient clusters, varying in both the phenotypic features as well as the illness outcome. Cluster 1. (Severe Insulin Deficient Diabetes SIDD), Cluster 2 (IRDD Insulin resistant diabetes), and Cluster 4 We found four patient clusters, varied in both the phenotypic traits as well as the illness outcome: Cluster 1. (Mild Age-Related Diabetes, MARD). Though SIDD and MARD resemble clusters described in other demographic groups, new clusters are IROD and CIRDD. Cox proportional dangers demonstrated that retinopathy, followed by CIRDD, is the largest risk for SIDD, whereas renal disease is at risk of CIRDD. (Anjana, Baskar, & Nair, 2020).

In another article the aim of the Systematic Literary Study is to evaluate the aspects of self-management education (DSME) for the women from Africa and Latin America with Type 2 diabetes mellitus in attempt to optimize their education in Diabetes. For randomized controlled trials and comparative analysis, we conducted literature searches in various health databases. Efficacy in improvement of glycated haemoglobin (HbA1c), physical activity, and diet results have been estimated as a basis for successful intervention. Rate differences calculations examined if an intervention function has influenced an outcome favorably or adversely. We found 38 interventional characteristics in connection to their effectiveness using the results of 13 trials included within our research. There have been favorable rate differences across five interventional characteristics with at least three results: hospital intervention, group interventions, utilization of situation solution, numerous sessions and the incorporation as interventionist of dietitians. Six operational characteristics exhibited strong positive result differentials. (Enza Gucciardi, 2013).

The transformation of the business environment and the global incidence of diabetes mellitus will greatly increase the business activity and trends in this area. The cost of the therapy will certainly affect the future market for diabetes mellitus; products with the appealing index therapeutic effectiveness may infiltrate the market. The development of the market interest of the major antidiabetic brands is driven mostly by their abrogation and the implied launch of generic products on the market. (Claudiu Morogvan, 2010)

The purpose of this study was to record the research after market in the pharmaceutical business and the implications on post-market studies of oral antidiabetics of labelling changes. A study literature identified metformin, glipizide, and pioglitazone post-market trials. Labeling modifications in MedWatch® have been identified as FDA reaction indicators for post-market pharmaceutical safety. The data for the pre- & post-market studies, study sponsorships, drug labelling changes and outcomes after drug use have become generic were evaluated by comparing industries and non-industries funded studies. Industry-wide studies were financed which revealed 149 (49%) and 155 (51%) on metformin; 33 (44%) and 42 (56%) on glipizide; and 85 (80.2%) compared with 21 (19.8%) pioglitazone. For metformin and glipizide, the variations in the positive outcomes between industry and non-industry trials were similar. After metformin and glipizide became generic, the number of research financed by the industry did not considerably rise. In compared with research promoted by the competitors in the business, studies supported by Glipizide manufacturers

showed considerably better results (90% positive, 10% neutral, 0% negative, $P < 0.05$). In industry-sponsored research (88.2 per cent), the outcomes for pioglitazone were considerably more positive than in non-industry studies (66.7 per cent) ($p = 0.008$). The numbers of labelling modifications to pioglitazone and post-market studies have a considerable connection ($p = 0.008$). Pharmaceutical industry and researchers' interests drive post-market research. Studies financed by the pharmaceutical company support the beneficial usage of the breakdown medication and reveal negative generic effects. There is a potential link between modifications to medication labelling and post-market research. (Nabil Khalidi, 2014).

Whereas lifestyle changes, like change in the diet and increased exercise, can be highly successful in improving glycemic control, medicines are required to achieve glycemic control over the long term for persons with T2DM. This chapter is intended to offer healthcare workers an overview of the present pharmacological alternatives available for treatment of T2DM patients orally and injected (non-insulin). Moreover, injection can be used to deliver glucagon such as peptide 1 (GLP-1) receptor agonists or amylin. Medications from the separate pharmacological classes may be used in a combination of two or more medications from various classes and with different mechanisms of action, either for themselves (monotherapy). USA and many other countries have a range of set combinations of 2 agents. This chapter discussed the usage of the glucose reduction medications, the action mechanism, and the influence on glycemic control, additional advantages, adverse effects and contraindications. (Feingold, 2000)

3. Research Objective:

Following are the key objectives of the research

- To be familiar with the market for anti-diabetic medication brands.
- To examine the Anti-diabetics market's competitive landscape.

4. Research Methodology:

4.1. Research Design-

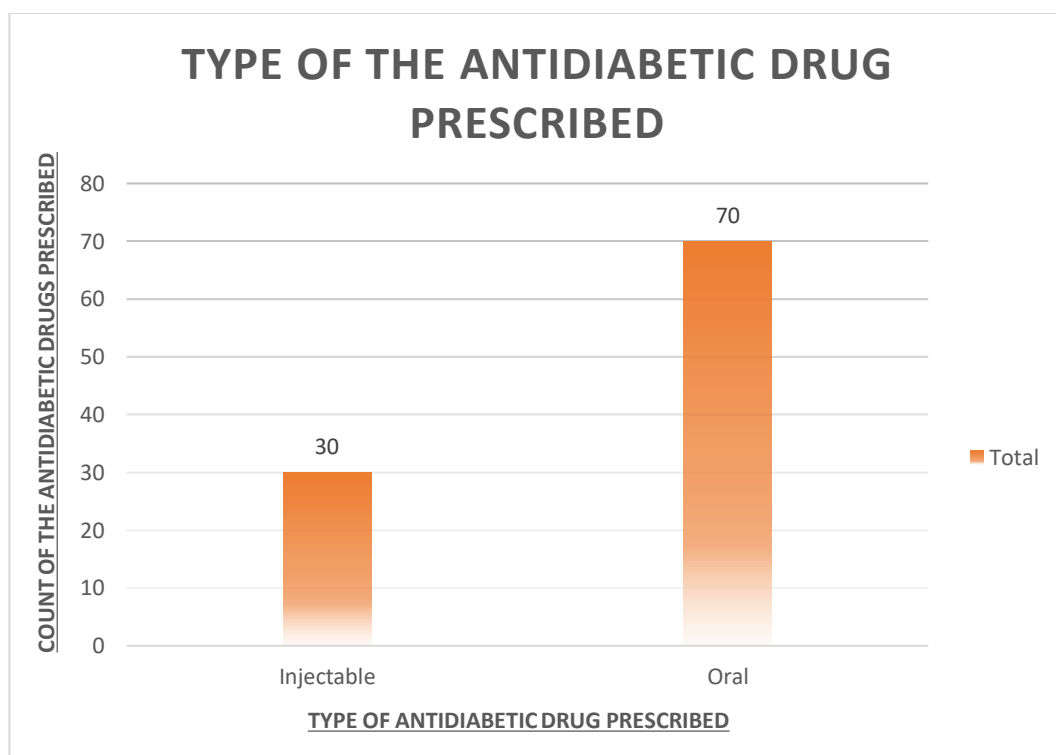
- Type of Research: Descriptive study
- Source of Data: Primary and Secondary Research.
- Data collection technique: Through survey- 80% through online mode of survey, 10% through telephone and rest 10% through physical interaction.
- Data collection tool: Questionnaire tool.
- Data Collection Method:
 - Primary Data Collection: A pretested structured questionnaire was framed for data collection.
 - Secondary Data Collection: Journals, PubMed Articles
- Duration of the study: 3 months (March 22 to June 19, 2021)

4.2. Sample Design-

- Target Population: Dispensing Pharmacists
- Sample Size: 100 Pharmacists
- Sampling technique: Non Probability-Convenience sampling.
- Study Area: Jaipur, Rajasthan
- Data Collection and Analysis: The responses obtained was collected, filtered, and statistically analyzed using tools like Microsoft Excel / R-studio.
- Measure of Ethics: Respondents were assured of Privacy and Confidentiality.
- Data Analysis and Interpretation: With the use of suitable statistical techniques, the data was analyzed and interpreted to arrive at the results.

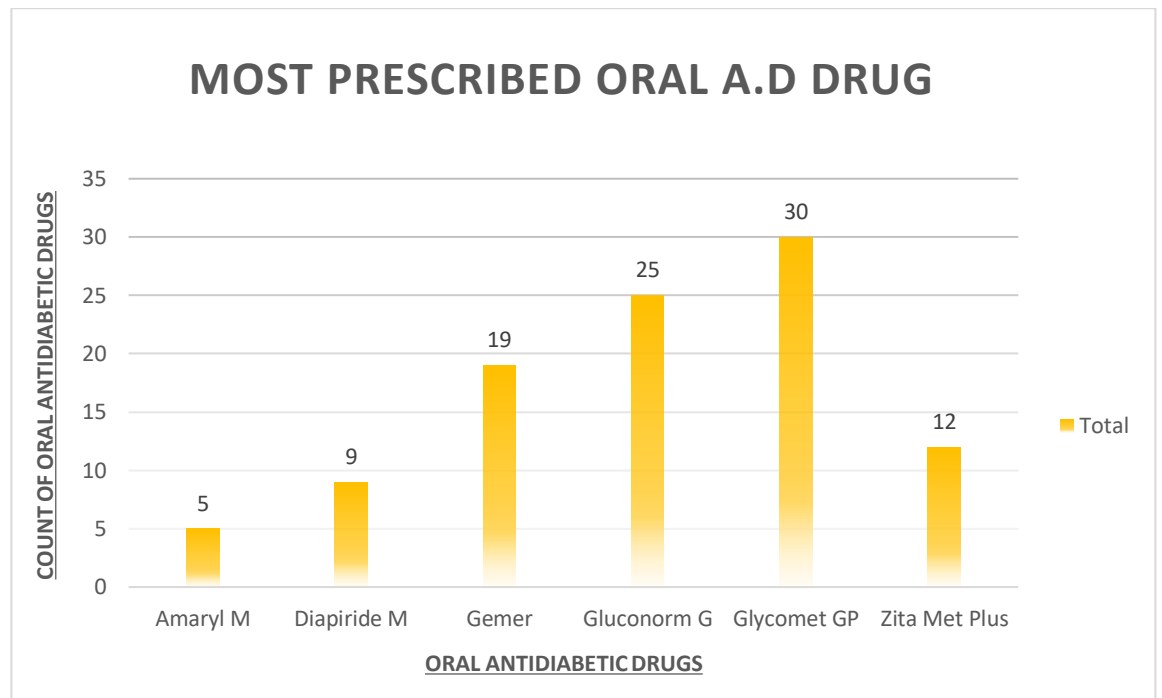
5. Results and Discussions:

1. Which type of Antidiabetic drugs are prescribed more to the patients according to the prescriptions you receive?



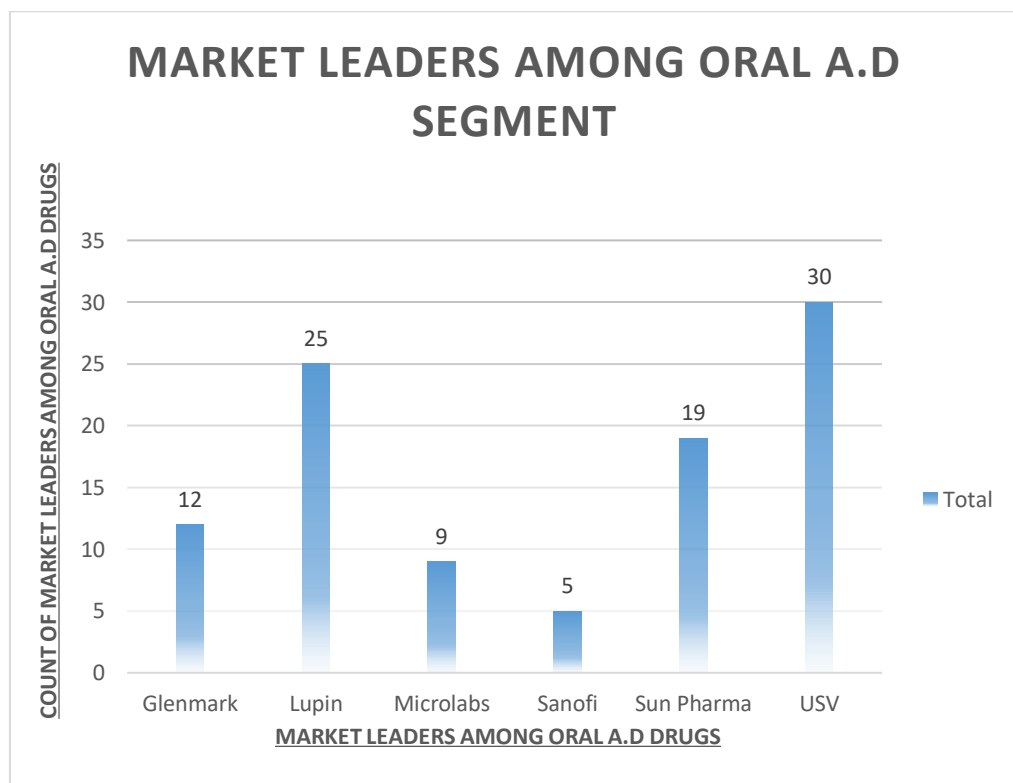
Interpretation: The above graph depicts the type of the antidiabetic drug mostly prescribed. In Jaipur, according to the survey report 70% Oral Antidiabetic drug whereas 30% injectable antidiabetic drugs are prescribed.

2. What is the most commonly prescribed oral anti-diabetic pill?



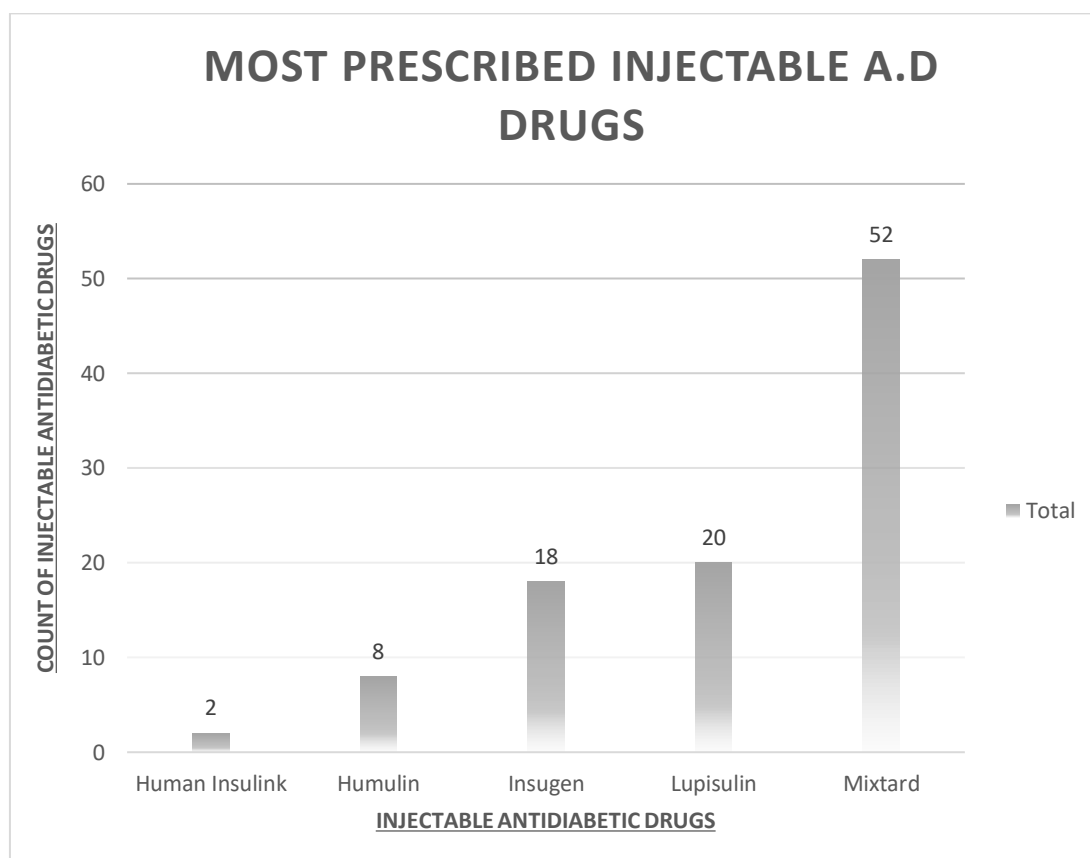
Interpretation: The graphical analysis depicts the mostly prescribed Oral Antidiabetic drug. Among the oral antidiabetic segment Glycomet GP (30%) is the most commonly prescribed medication followed by Gluconorm G (25%), Gemer (19%), Zita Met Plus (12%), Diapiride M (9%) and Amaryl (5%).

3. According to you which is the market leader among the oral anti diabetic segment?



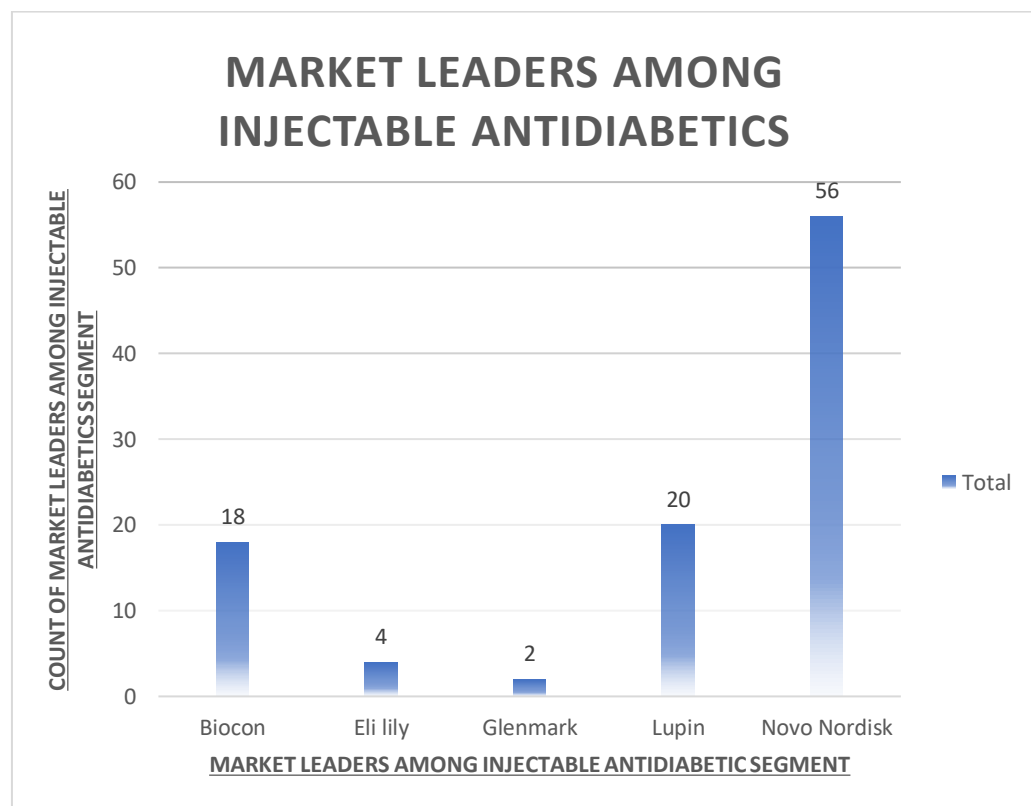
Interpretation: This graphical analysis depicts the market leader in the oral antidiabetic segment. Among the oral antidiabetics market, the leading position is acquired by USV (30%), whereas the 2nd position is bagged by Lupin (25%) followed by Sun Pharma (19%), Glenmark (12%), Microlabs (9%) and Sanofi (5%) at last position.

4. Which is the most commonly prescribed injectable anti diabetic drug?



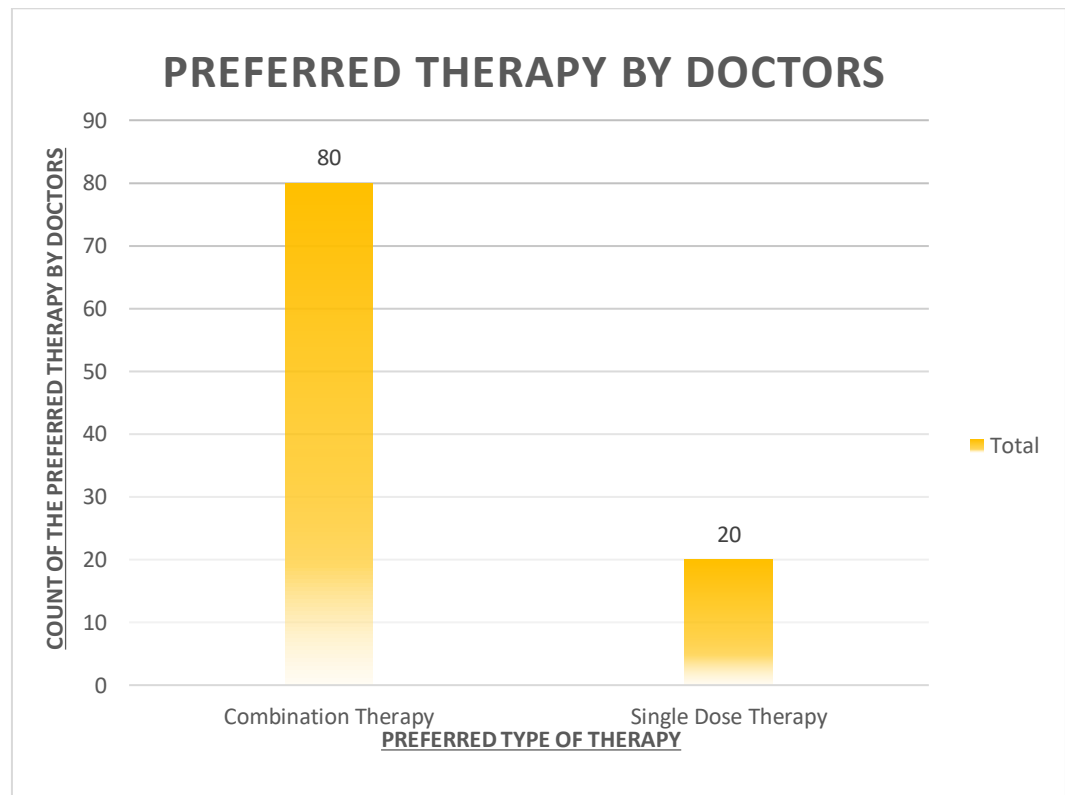
Interpretation: This graphical analysis depicts the most commonly prescribed Injectable antidiabetics. Among the injectable antidiabetics Mixtard is the top most prescribed injectable antidiabetic (52%) which contributes more than 50% of the market share. Lupisulin being the second most prescribed injectable antidiabetics (20%), followed by Insugen (18%), Humulin (8%) and Human Insulink (2%).

5. According to you which is the market leader among the injectable anti diabetic segment?



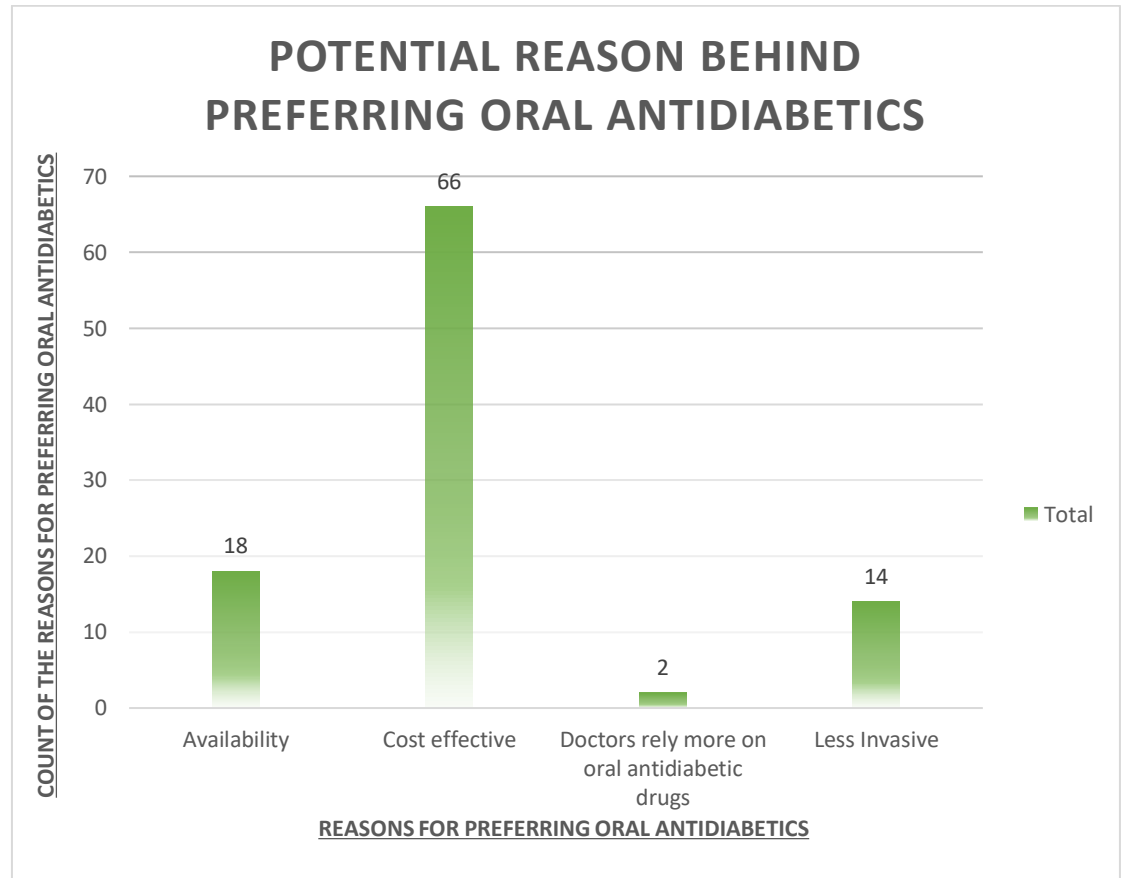
Interpretation: The graphical analysis depicts the market leader among the Injectable antidiabetics segment. Among the Injectable antidiabetics, the top market leader is Novo Nordisk (56%) whereas the 2nd market leader among these is Lupin (20%) followed by Biocon (18%), Eli Lilly (4%) and Glenmark (2%).

6. What do you think is the most preferred therapy by doctors?



Interpretation: The graphical analysis depicts the preferred type of therapy recommended by the physicians. According to the results, Combination therapy (80%) is the most picked therapy by the physicians and recommended to the patients. The reason being cost effectiveness and also the patients might not miss the dose. Rest (20%) also recommends Single dose therapy.

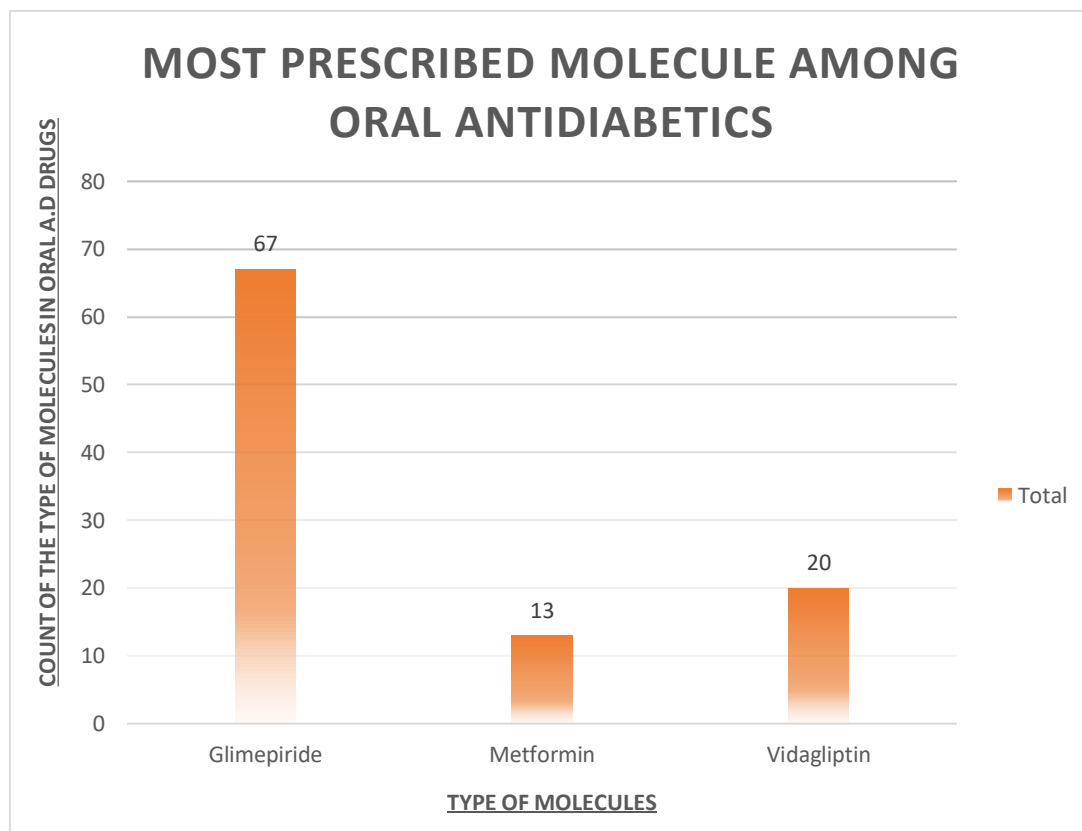
7. What must be the potential reason behind preferring oral antidiabetic drugs?



Interpretation: The graphical analysis depicts the potential reason behind preferring the oral antidiabetics over the injectable antidiabetics.

The main reason behind preferring oral antidiabetics over injectable is Cost effectiveness (66%). Moreover the oral antidiabetics are widely spread and available (18%), followed by less invasiveness (14%) and lastly the dependency of physicians over oral antidiabetics (2%).

8. What is the most prescribed molecule among the oral antidiabetic drugs?



Interpretation: The graphical analysis shows the most prescribed molecule among the oral antidiabetics segment. Glimepiride (67%) being the top molecule prescribed among oral antidiabetics followed by Vidagliptin (20%) and Metformin (13%) being the least.

6. Conclusion:

The survey was conducted in the region of Jaipur during March 2021 to June 2020. The target audience were the dispensing pharmacists from various pharmacies in the desired location where research is to be carried out. The sample size chosen was 100 dispensing pharmacist. From the statistical and graphical analysis of data it has been observed that oral antidiabetics are prescribed more as compared to the injectable antidiabetics. Out of 100 people 70% participants recorded that oral antidiabetics are preferred, whereas 30% injectable antidiabetics are prescribed. Among the oral antidiabetics Glycomet GP (30%) is the most prescribed drug, followed by Gluconorm G (25%), Gemer, Zita Met Plus, Diapiride and Amaryl. Among the Injectable antidiabetics it has been observed that Mixtard (52%) is at the leading position of prescription followed by Lupisulin (20%), Insugen, Humulin and Human Insulink.

In the Injectable antidiabetics segment Novo Nordisk (56%) is the market leader, whereas in the case of Oral antidiabetics segment USV (30%) is the market leader. Rest Lupin, Biocon, Eli Lilly and Glenmark are below Novo Nordisk in the injectable market. Lupin, Sun Pharma, Glenmark, Microlabs and Sanofi are below USV in the oral market. Moreover, Physicians recommend Combination therapy (80%) over Single Dose Therapy, due to cost effectiveness and the patients might not miss their dose.

Oral antidiabetics are preferred more over injectable majorly due to the cost effectiveness (66%), followed by availability and less invasiveness. There are various molecules associated with the antidiabetic drugs in which Glimepiride (67%) being the most prescribed followed by Vidagliptin (20%) and Metformin (13%).

7. Recommendations:

It is clear from the preceding explanation that oral antidiabetic medications are more preferred than injectable treatments. In the case of injectable medicines, Novo Nordisk is the dominant player, whereas USV is the industry leader in the case of oral anti-diabetic treatments. Glimepiride is one of the most often recommended oral anti-diabetic medications, though combination therapy is preferred over single-dose therapy. Since combination therapy is less expensive, it's a good idea to try it.

8. Limitations of the study:

Due to COVID-19 social distancing posed a few challenges for the effective execution of market research. In-person interviews and focus groups are tough to conduct. Virtual substitutes exist, however this raises questions regarding data reliability. Screen-to-screen discussions have different effects than face-to-face encounters. Digital sessions also makes the work more difficult. It's not the same reading body language on a screen. Connecting with an interviewee or participating in a focus group isn't easy. It's difficult to duplicate the same level of efficiency as compared to the physical interaction with the participants.

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10. Annexure:

10.1. Ethical Consideration:

The research study was carried out in accordance with the established research procedures. The study participant was provided time to express their real feelings about the research topics. The participants' consent was obtained, and proper permission was granted for the use of their data.

The respondent's identity was revealed with their permission, and if they were unwilling to do so, their identity was kept confidential.

10.2. Questionnaire:

1. Which type of Antidiabetic drugs are prescribed more to the patients according to the prescriptions you receive?
 - a. Oral
 - b. Injectable
2. Which is the most prescribed oral anti diabetic drug among these:
 - a. Amaryl M
 - b. Diapride M
 - c. Gemer
 - d. Gluconorm G
 - e. Glycomet GP
 - f. Others (Pls Specify)

3. According to you which is the market leader among the oral anti diabetic segment?
 - a. Lupin
 - b. Microlabs
 - c. Sanofi
 - d. USV
 - e. Sun Pharma
4. Which is the most prescribed injectable anti diabetic drug among these:
 - a. Mixtard
 - b. Humulin
 - c. Lupisulin
 - d. Insugen
 - e. Others (pls specify)
5. According to you which is the market leader among the injectable anti diabetic segment?
 - a. Lupin
 - b. Biocon
 - c. Eli lily
 - d. Novo Nordisk
6. What do you think is the most preferred therapy by doctors?
 - a. Combination Therapy
 - b. Single dose therapy
7. What must be the potential reason behind preferring oral antidiabetic drugs?
 - a. Availability
 - b. Less invasive
 - c. Doctors rely more on oral antidiabetic drugs
 - d. Cost effective
 - e. Others
8. What is the most prescribed molecule among the oral antidiabetic drugs?
 - a. Glimepiride
 - b. Metformin
 - c. Vidagliptin

10.3. Plagiarism Report:

The plagiarism came out to be 12% which was thoroughly checked through the Institution's library software "turnitin".

Attaching the screenshot of the report:

