

Product Market Strategy & Performance: An Analysis of Modern Next Generation Insulin in South India

By

Hetarth Jitendrabhai Dalia

*Dissertation submitted in partial fulfillment of the requirements of the degree
MBA Hospital and Health Management*

Academic year, 2018-2020



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INTERNSHIP CERTIFICATE

2nd May 2020

The certificate is awarded to **Hetarth J Dalia** in recognition of having successfully completed his Internship in the department of **Commercial Affairs and Strategy**. Hetarth, has successfully completed the projects on "Improving market penetration of 'Device India' for South India" and "Market strategy and Market performance analysis of Ryzodeg in South India", from 3rd February 2020 to 2nd May 2020 in **Novo Nordisk**. During his internship he demonstrated a committed and diligent attitude with a strong drive for learning.

We wish him all the best for future endeavours.



Akanksha Gupta

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled Product market strategy and market performance analysis of Modern insulin Next Generation Insulin (MI+NGI) in South India and submitted by Hetarth Dalia Enrollment No: - 0749 under the supervision of Dr Dhirendra Kumar for award of MBA in Hospital and Health Management of the University carried out during the period from 3rd Feb 2020 to 2nd May 2020 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Signature

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ABSTRACT

Title: - Product market strategy and market performance : An Analysis of Modern Insulin Next Generation Insulin (MI+NGI) in South India.

Author: Hetarth Dalia

Background: Diabetes is chronic metabolic disorder characterized by persistent hyperglycaemia resulting from defects either in Insulin secretion or in Insulin action or in both. The aim of the treatment is to relieve symptoms and make a balanced control of diabetes and prevention of hyperglycaemia. In case of type-1 diabetic use of insulin is a must as there is absolute insulin deficiency, where as in case of type-2 diabetics initially diet then diet and exercise followed by OADs are tried. In the event of failing of diet, exercise and oral antidiabetics insulin is initiated. A combination of modern insulin and next generation insulin has been shown excellent glycaemic control with high efficiency and safety and with a low risk of hypoglycaemia in a simple treatment regimen.

Objectives:

- To establish that Ryzodeg (MI+NGI) is the most economical quality than traditional Human insulin in the market
- To promote and establish that Ryzodeg (MI+NGI) has better result in HbA1C control as compared to human insulin
- To enhance the penetration of Ryzodeg (MI+NGI) in south India

Methodology:

A Descriptive study was done at Novo Nordisk India. The study was carried out during the working on the ongoing project and some insights were noted to improve the sales performance. This is a descriptive study and analysis of internal and external factors affecting or influenced in promotion of Ryzodeg (MI+NGI).

Results and Conclusion:

Premix insulins are the right suited for Indian reality of high carbohydrate diet which provide Total control. Ryzodeg provides 1.4% reduction in HbA1c from the baseline which is significantly superior as compared to IGlax U100 and also provides additional PPG control of 57 mg/dl. Coming to market scenario of Ryzodeg, overall growth of 20% shows the great user satisfaction and its effectiveness in Total control of PPG and FPG level. Major prescribers; cardiologist, diabetologist, endocrinologist and general physicians; are now shifting to the premix insulins from human insulins especially prescribing Ryzodeg instead of Novomix. Ryzodeg is very unique product which gives better outcome, and also with lower volume it gives higher revenue contribution, eventually which helps in business growth.

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Introduction

Basics of Diabetes

Diabetes is a local and global health emergency of the 21st century. Globally, it is estimated that, there are 422million people living with diabetes. Among patients aged 20-79 years, diabetes accounts for 10.7% of global all-cause mortality and it is rated as one of the top 10 causes of death. Diabetes is progressive in nature and requires life-belong medication. Hence the health care cost is significantly higher among patients living with diabetes compared to those without diabetes. Since large proportion of patients living with diabetes reside in India subcontinent, it is important to understand the economic and social economic productivity of the country and income-earning ability of individuals. Currently, India faces an uncertain future with respect to the social and economic impact of the burden of diabetes.

Normal Physiology

FPG	80-100 mg/dl
PPG	100-140 mg/dl
HbA1C	4-5.7%
Blood Pressure	120/80 mmHg
Total Cholesterol	<= 200mg/dl
HDL	>= 45 mg/dl
LDL	<= 100 mg/dl
Triglyceride	<= 150 mg/dl

Diabetes Mellitus

Diabetes Mellitus is chronic metabolic disorders characterized by persistent hyperglycaemia resulting from defects in: 1) Insulin secretion; 2) Insulin action or; 3) Both. [1]

Diabetes can be classified as:

- Type-1
- Type-2
- Gestational Diabetes Mellitus (GDM)
- Others

Treatment of Diabetes Mellitus

The aim of the treatment in Diabetes is to relieve symptoms and maintains a balance between good control of diabetes and prevention of hypoglycaemia [2]. To prevent or delay complications and death by keeping glucose levels under control and to improve quality of life of patients.

Majority of the severe complications can be reduced or prevented by:

- 1) Early diagnosis; 2) Improved metabolic control and, 3) Regular examination to look for complications.

As in type-1 diabetes there is absolute deficiency of insulin, daily injections of insulin are essential to maintain a normal or near normal blood glucose levels, prevent death from ketosis and coma, relieve symptoms of uncontrolled diabetes and avoid complications [3].

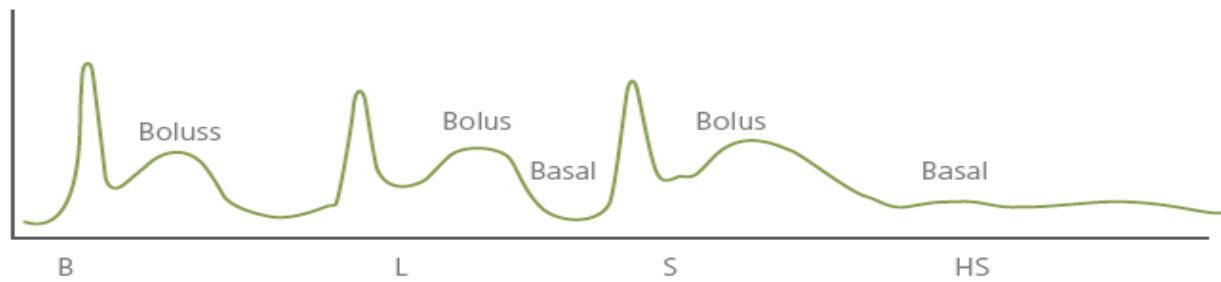
As in type-2 diabetes there is relative insulin deficiency, insulin resistance or both, so insulin is not mandatory for the treatment of type-2 diabetes. Education, diet and exercise are adjuvant to drug therapy: OADs or Insulin. Monitoring of glycaemia is very important and aim is to achieve as much near normal glycaemia as possible without jeopardizing the patient.

Insulin

Insulin is an endocrine anabolic hormone secreted from the “beta”-cell in the islet of Langerhans in the pancreas. Insulin is originally a lengthy molecule, which is converted within the beta cell to proinsulin. Proinsulin is further broken down in beta cells into insulin and a protein fragment called C-peptid. The active insulin protein consists of two chains of amino acids (A-chain and B-chain) that are linked by two disulphide bonds [3]. A-chain contains 21 amino acids and B-chain contains 30 amino acids. Insulin has profound effects on carbohydrate, fat and protein metabolism and to some extent on water and electrolyte balance. Insulin deficiency can lead to elevated plasma glucose referred to as hyperglycaemia, elevated plasma lipids especially triglycerides referred to as hypertriglyceridemia, and altered protein metabolism leading to metabolic and immune defects. Insulin replacement in diabetes tends to restore normalcy [3].

Action of Insulin

Insulin has integrated action on carbohydrate, protein and fat metabolism. It has dominant effect on glucose homeostasis, which is predominantly exerted in three tissues: liver, skeletal muscles and fat or adipose tissue. Insulin brings down blood glucose and maintains normal blood glucose levels between 4-6 mmol/L (72-108 mg/dl). Meal-related insulin is secreted in 2 phases: phase 1 (rapid phase) and phase 2 (prolonged phase) with each meal (as shown in the graph).



Insulin Therapy

In case of type-1 diabetic use of insulin is a must as there is absolute insulin deficiency, where as in case of type-2 diabetics initially diet then diet and exercise followed by OADs are tried. In the event of failing of diet, exercise and oral antidiabetics insulin is initiated.

Modern Insulin (Insulin Analogues)

Modern Insulin or Insulin Analogues are manufactured in the laboratory by modifying the chemical structure of human insulin, so that the resulting compound has different chemical properties as compared to human Insulin. Modern Insulin offer greater control and better safety profile by mimicking physiological insulin profile [3].

Novorapid (insulin aspart): Novorapid is rapid acting insulin analogue. In human insulin amino acid structure Proline at B-28 position is replaced by aspartate.

Levemir (Insulin detemir): Levemir is long acting basal insulin analogue. In human insulin amino acid structure, B-30 is completely removed and in Position B-29, a 14-c fatty acid (Myristic Acid) is added.

NovoMix (30% insulin aspart + 70% protaminated insulin aspart): NovoMix is premixed analogue. It contains 30% of rapid acting analogue NovoRapid and 70% protaminated insulin aspart

Next Generation Insulins (NGIs)

Ryzodeg: It is the combination of two distinct insulin analogues in one pen: insulin degludec and insulin aspart, in the ratio of 70% and 30% [2]. This is the first combination of a basal insulin with an ultra-long duration of action and a well-established mealtime insulin in one pen for people with type 2 diabetes [2]. It has been developed to provide excellent overall glycaemic control with a low risk of hypoglycaemia in a simple treatment regimen [3].

Literature Review

A. Philis-Tsimikas, K. Astamirova, Y. Gupta, A. Haggag, D. Roula, B.A. Bak, E.G. Fita, A.M. Nielsen, T. Demir et al (2019), [1], explained that treatment with IDegAsp (insulin degludeg + insulin aspart) is more effective than treatment with multiple injections basal-bolus therapies. In the two study groups, one with the treatment of IDegAsp once daily and second with multiple injections basal-bolus therapies, are compared for 38 weeks, and efficacy and safety were observed with both the groups. At week 38, more patients, with the treatment of IDegAsp, achieved target HbA1c without hyperglycaemia than the treatment with multiple basal-bolus injections therapies.

Y. Onishi, Y. Ono, R. Rabøl, L. Endahl & S. Nakamura (2013); [2]; reviewed of the patients who has type-2 diabetes and already on insulin therapy. The study was aimed to check the efficacy and safety of IDegAsp in insulin-naïve Japanese adult patients. It was a randomised control trial, one group with IDegAsp and second group with insulin glargine (IGlar), were observed for 26 weeks. After 26 weeks, mean HbA1c reduction was more in patient group with the treatment of IDegAsp than patient group with treatment of IGlar. At the end of the study, result shows the superiority of IDegAsp to IGlar, which means that the IDegAsp provided long term glycaemic control compared to IGlar, with similar FPG control.

Vishal Gupta, Ranya Baabbad, Eva Hammerby, Annie Nikolajsen & Asrul Akmal Shafie (2015); [3] explained the cost-effectiveness of switching to modern insulin from human insulin. 1-year treatment cost and quality-of-life data was analysed. The treatment is associated with an increase in life expectancy in India, Indonesia and Saudi Arabia. Switching from human insulin to modern insulin was found to be cost-effective in India, Indonesia and Saudi Arabia for long term and short term.

KJELD HERMANSEN, MICHELE COLOMBO, HEIDI STORGAARD, ANETTE ØSTERGAARD, KLAUS KØLENDORF, STEN MADSBAD (2002); [4]; explained the improved postprandial glycemic control with modern insulin relative to rapid-acting insulin and human insulin. This was open-labeled, randomised, crossover study. Insulin-treated subjects with type-2 diabetes was taken. It was observed that 10% lower PPG with modern insulin compared to human insulin and rapid-acting insulin and also significantly lower glucose excursion during late post-prandial phase. The study demonstrated that the modern insulin improves postprandial glucose control compared with other insulin categories.

Methodology

Research Objectives

- To establish that Ryzodeg (MI+NGI) is the most economical quality than traditional Human insulin in the market
- To promote and establish that Ryzodeg (MI+NGI) has better result in HbA1C control as compared to human insulin
- To enhance the penetration of Ryzodeg (MI+NGI) in south India

Research Question

How can the market penetration of product – Ryzodeg (MI+NGI) be improvised to forecast the long-term revenue?

Study Design

A Descriptive study was done at Novo Nordisk India. The study was carried out during the working on the ongoing project and some insights were noted to improve the sales performance. This is a descriptive study and analysis of internal and external factors affecting or influenced in promotion of Ryzodeg (MI+NGI).

Sampling Method

The sampling method was Non-Probability (Purposive) sampling.

Sampling Size

The study was carried out in South India. Majorly it included Karnataka, Tamil Nadu, Kerala, Andhra Pradesh.

Inclusion Criteria

Internal sales data of Ryzodeg (MI+NGI) of south India was collected which included region wise sales details, prescription and prescribers details, lead generation detail.

Data Collection

For the study, Record review of internal sales data and external market share data was and the observations were noted. External market share data was referred from the report published by IQVIA consultancy. Above all secondary data was analysed.

Sample Size

This is a study where in record review of the and market share data in Novo Nordisk India, sampling and sample does size is not applicable.

Analysis Technique

Data was analysed in Microsoft Excel (MS-Excel).

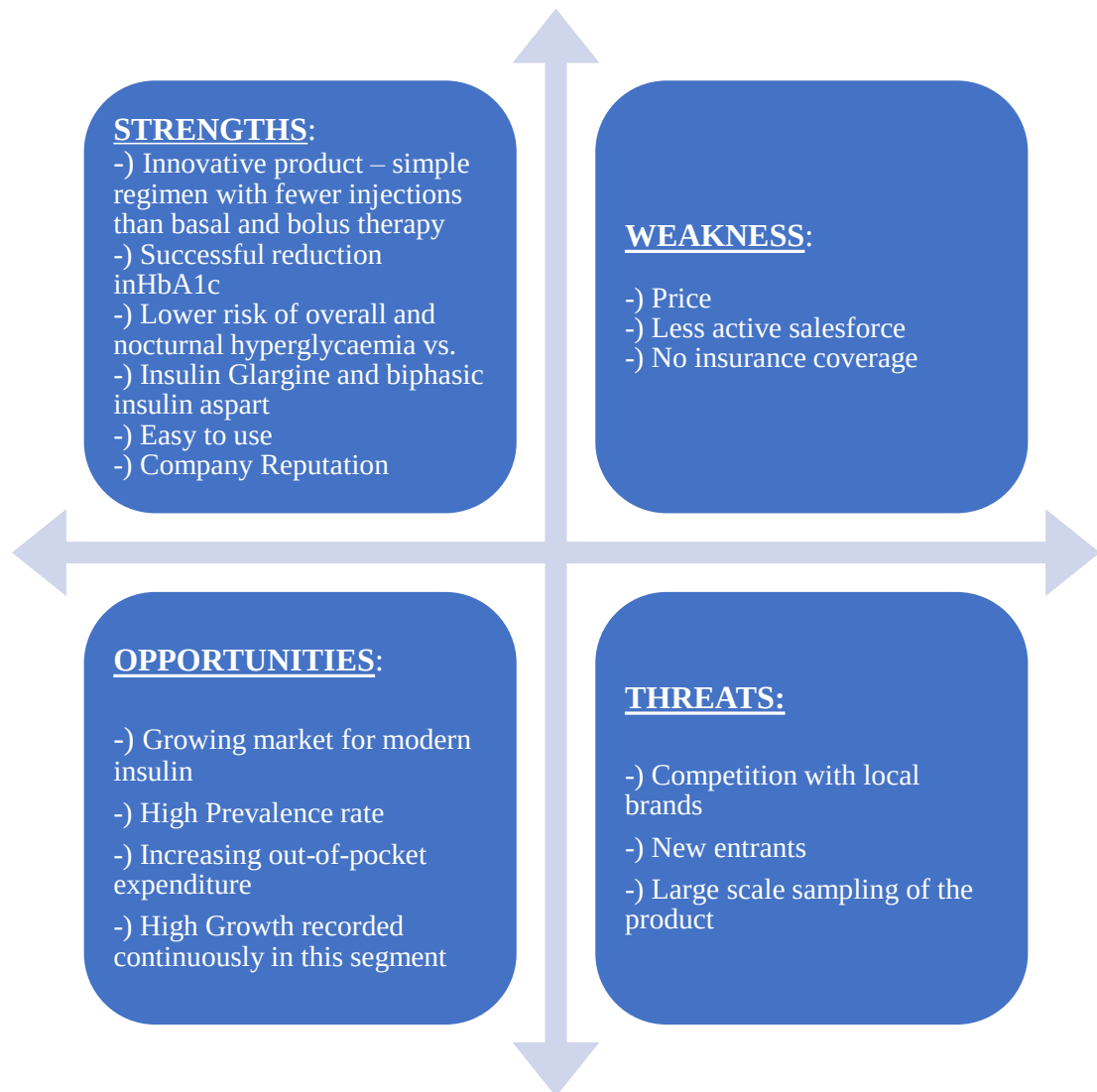
Study Duration

3 moths: - 3rd Feb 2020 to 2nd May 2020

Results

Secondary Data Analysis

SWOT Analysis :



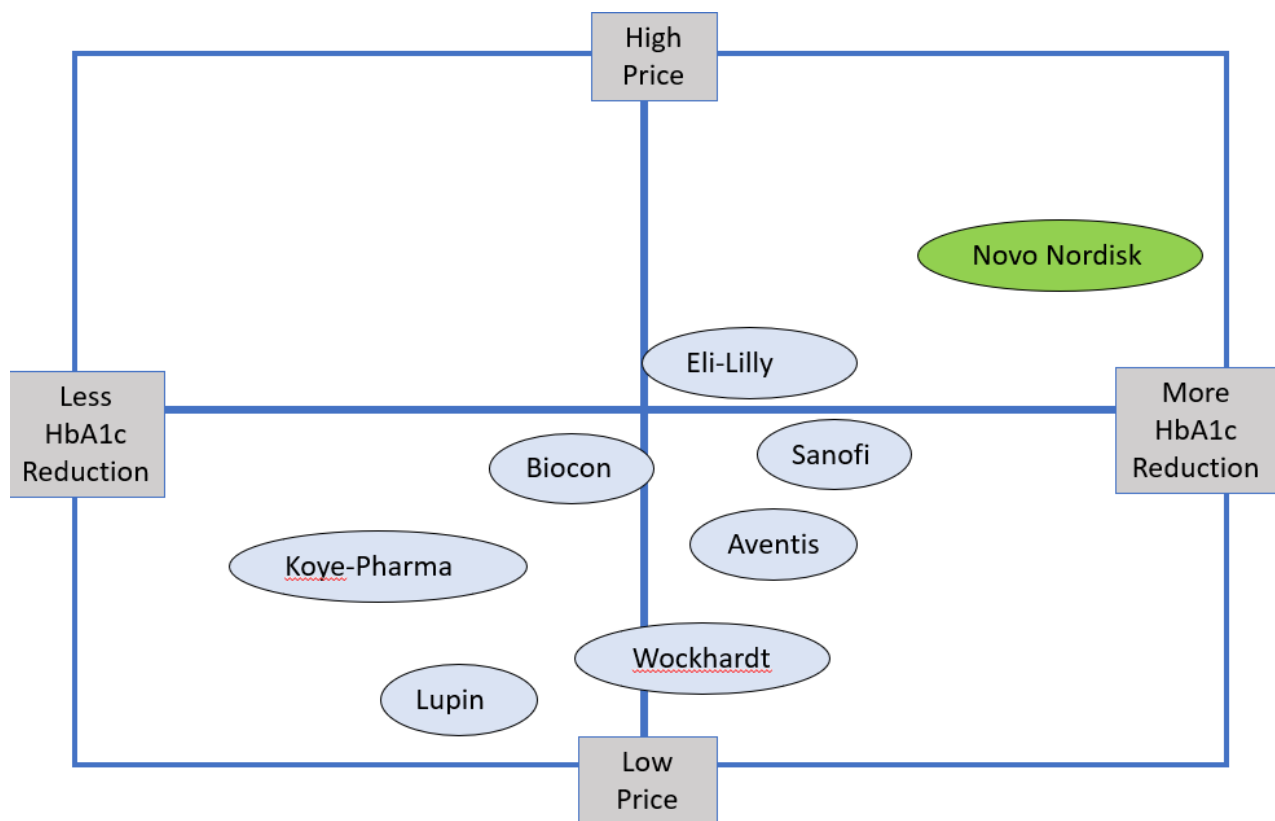
Stakeholder Matrix:

	Interest	Importance
Patient	Low	High
Medical Professionals	High	High
Nurses	Low	Moderate
Online Pharmacy	Moderate	High
Chemist	High	High
Stockist	Moderate	Moderate

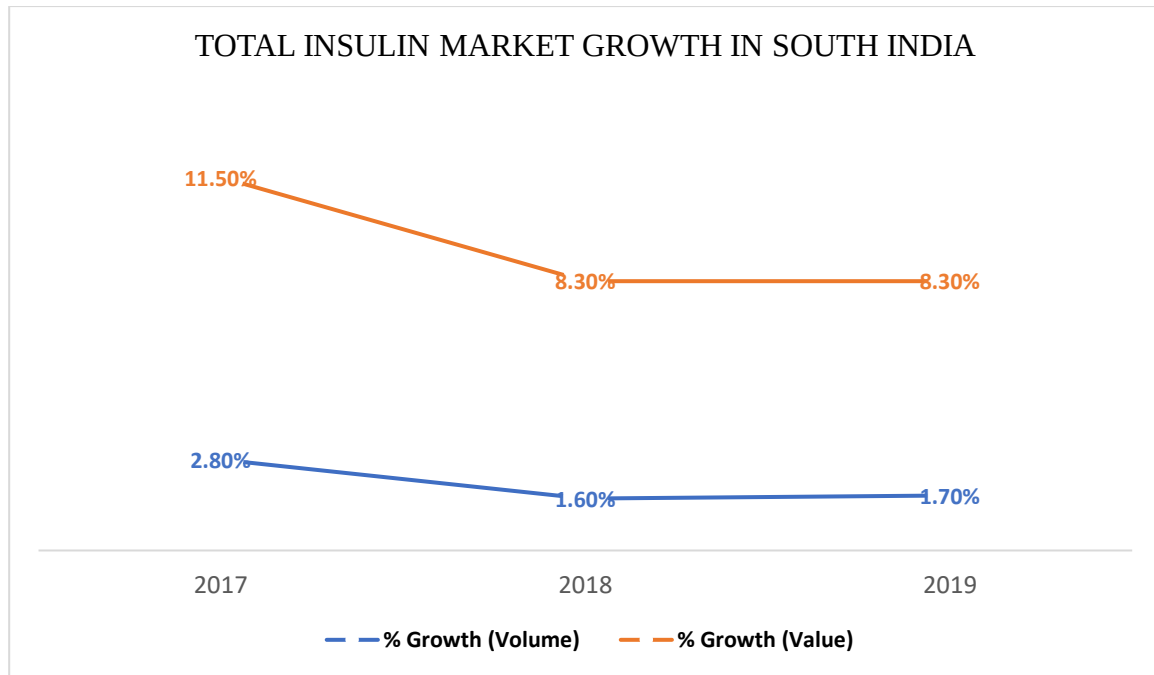
Segmentation:

- Cardiologist
- Physician
- Endocrinologist
- Diabetologist
- Nephrologist

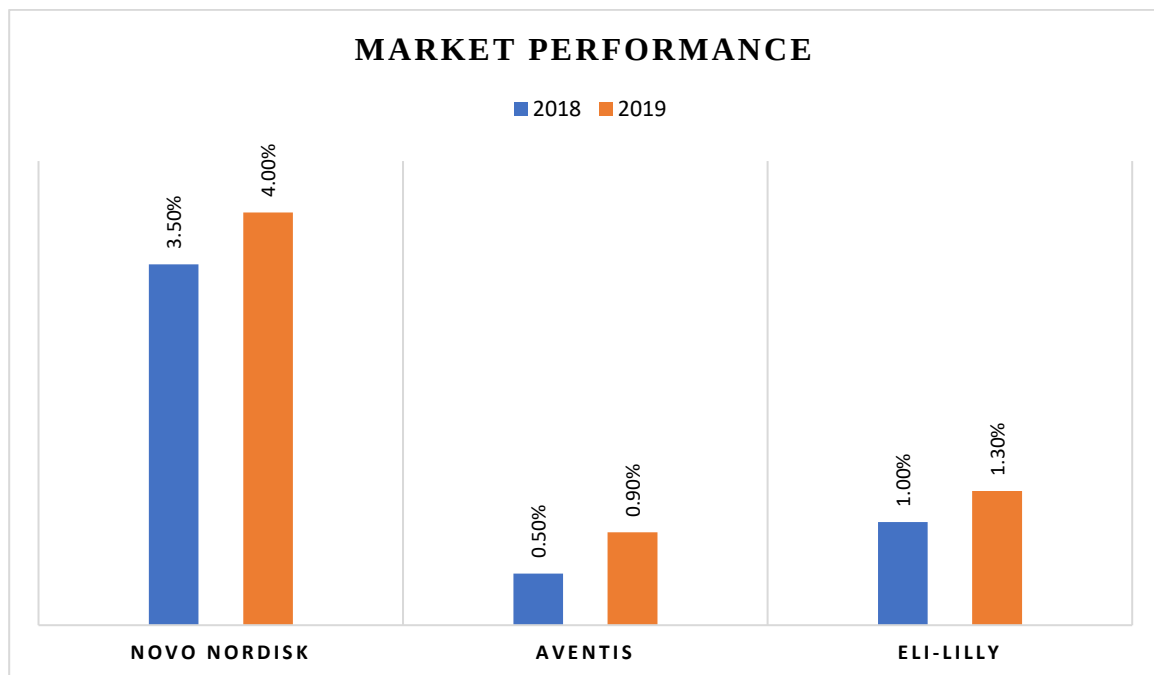
Positioning:



Market Share Analysis



By observing data of total insulin market share, it can be said that overall insulin analogue market (volume) is growing by more than 1.5% and parallelly value market is growing by more than 8%.



Aventis and Eli-Lilly, both are major competitors of Novo Nordisk. From market share data provided by IQVIA, Novo Nordisk has covered approx. 60% of total market of modern insulin, whereas other two major competitors have covered less than 25% of total market of modern insulin. In south India, Novo Nordisk modern insulin market share is growing by 4%.

Total_MS		NN_MS	
	Growth % (Vol)	Growth% (Val)	Growth % (Vol) Growth% (Val)
ANDHRA PRADESH	6.8%	13.7%	19.8% 25.6%
KARNATAKA	-11.3%	-5.0%	-9.4% -2.0%
KERALA	-0.5%	5.2%	-14.0% -7.9%
TAMIL NADU	9.1%	15.9%	10.7% 18.1%

State-wise analysis shows that total Insulin market (volume) is degrowing in Karnataka and Kerala by 11% and 0.5% respectively, where Novo Nordisk MS is also degrowing in Karnataka and Kerala by 9% and 14%.

NN MS(Vol)					NN MS(Val)				
	2017	2018	2019	%Growth		2017	2018	2019	Growth
Bangalore	65.1	55.5	58.5	-10.5	Bangalore	68.3	60.3	64.0	-1.8
Chennai	69.5	64.8	63.2	1.5	Chennai	73.5	69.8	68.4	8.3
Coimbatore	62.7	58.4	54.1	1.1	Coimbatore	66.3	63.3	59.8	9.2
Hyderabad	40.5	47.0	57.7	37.1	Hyderabad	45.4	51.3	61.2	42.7
Kochi	59.9	58.2	52.5	-31.9	Kochi	63.7	59.9	54.0	-29.2
Madurai	68.2	73.1	71.9	52.8	Madurai	69.6	75.0	75.5	73.6
VIJAYWADA	65.0	71.3	71.4	-19.4	VIJAYWADA	67.5	74.6	74.8	-15.1
Vizag	45.4	38.9	42.8	23.7	Vizag	48.8	44.1	49.7	36.4

By analysing metro-wise market share data, Bangalore, Kochi and Vijayawada are not performing well as they're losing their market of insulin analogue. Whereas Hyderabad, Madurai and Vizag are showing excellent growth.

Bangalore MS (Vol.)				
Company	2017	2018	2019	%Growth
Lantus	16.3	21.9	20.5	-20.4
Eli-Lilly	8.1	9.9	8.5	-26.7
Ryzodeg	3.2	5.2	7.3	19.4

Bangalore MS (Val.)				
Company	2017	2018	2019	%Growth
Lantus	16.7	21.2	19.4	-15.5
Eli-Lilly	7.2	8.8	7.3	-23.5
Ryzodeg	7.7	11.0	14.6	23.0

Kochi MS (Vol.)				
Company	2017	2018	2019	%Growth
Lantus	17.4	17.4	20.7	-10.1
Humalog-Mix	10.2	9.7	9.4	-26.0
Ryzodeg	3.6	3.2	3.0	-28.2

Kochi MS (Val.)				
Company	2017	2018	2019	%Growth
Lantus	17.3	17.7	21.7	-3.3
Humalog-Mix	8.9	9.3	9.2	-22.9
Ryzodeg	8.3	7.2	6.8	-26.0

Vijaywada MS (Vol.)					Vijaywada MS (Val.)				
Company	2017	2018	2019	%Growth	Company	2017	2018	2019	%Growth
Lantus	17.7	12.9	11.1	-30.7	Lantus	19.0	13.3	11.4	-27.3
Aventis	19.3	14.9	14.0	-24.7	Aventis	20.4	15.1	14.6	-18.0
Ryzodeg	1.6	5.2	5.9	-9.2	Ryzodeg	3.7	11.0	12.2	-6.6

From the metro wise competitor analysis, it can be seen that in Bangalore, Ryzodeg is growing by more than 10%; in Kochi, it's degrowing by more than 25% and in Vijaywada, degrowth is approx. 9%. And in comparison, Lantus is showing quite good performance in Kochi.

Internal Sales Data & KPI Analysis

South Zone (Val.)					South Zone (Vol.)			
	YTD Feb'20	% Contr.	AMS Growth	2019	YTD Feb'20	% Contr.	AMS Growth	2019
PIT	3,435	29%	13%	18,162	113,181	3%	7%	633,898
Novmix	2280	19%	7%	12,809	92,825	2%	4%	537,758
Ryzodeg	1154	10%	29%	5,353	20,356	0.5%	27%	96,141
Total	11,771	100%	10%	64,442	4,305,764	100%	4%	23,852,803

Overall growth of Ryzodeg is more than 20%, which shows that the product is highly effective and gives accurate result. More customers are shifting to the MI+NGI from human insulin.

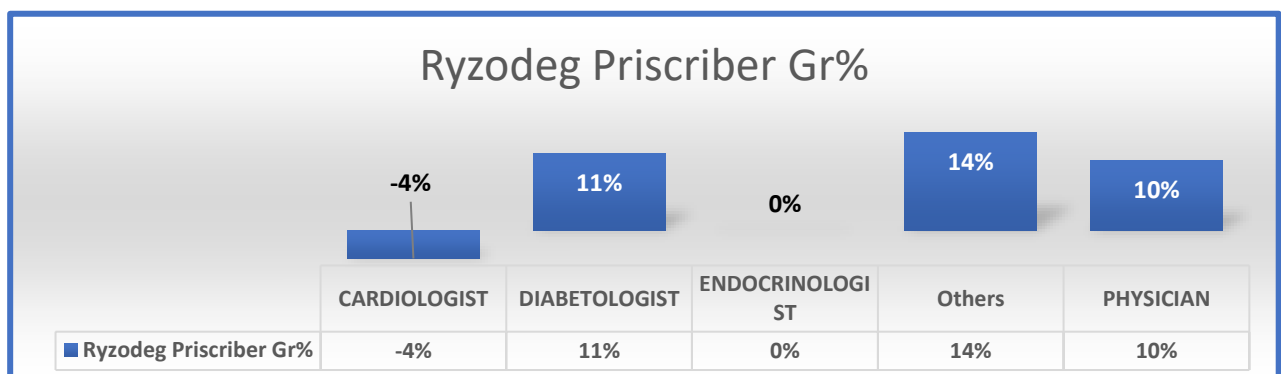
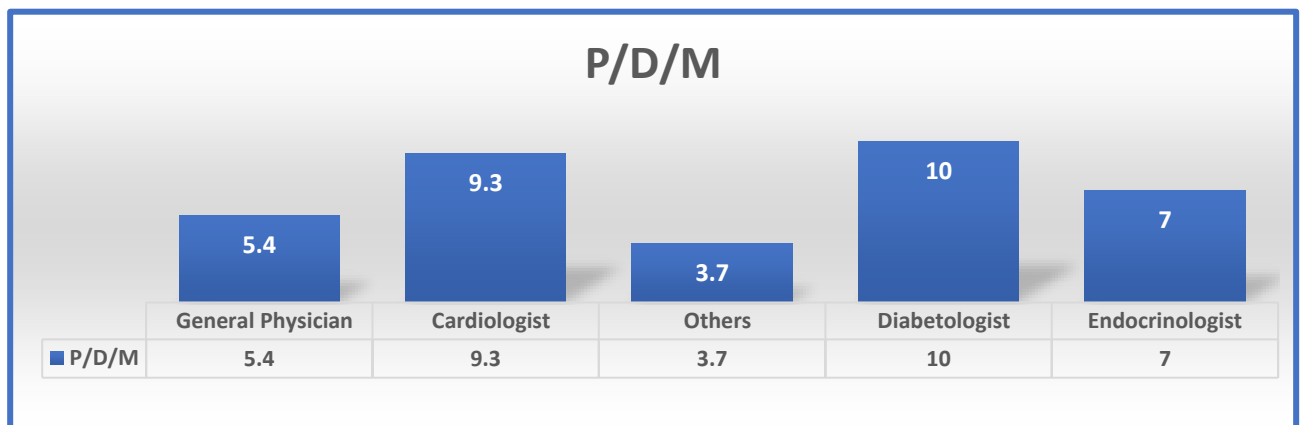
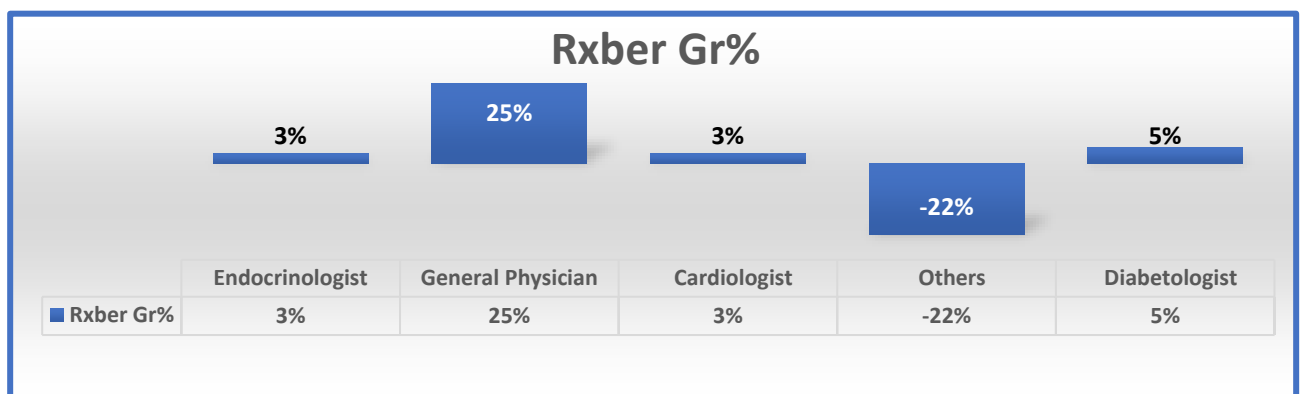
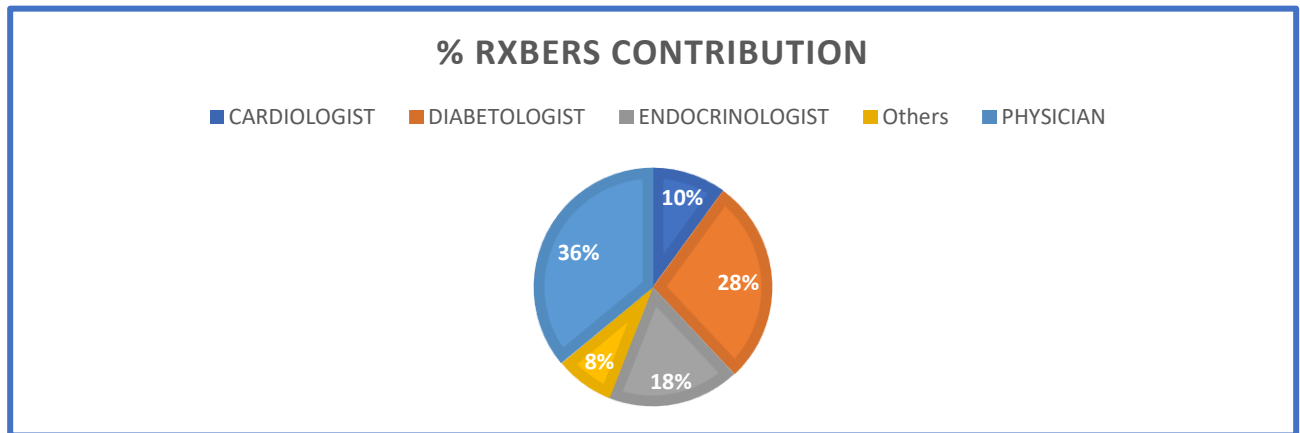
Above data shows that low volume contribution of Ryzodeg is still giving good value proposition, approx. 0.5% of volume contributes almost 10% of overall premix value. So, if the sales of Ryzodeg is being increased, overall revenue will be increased.

Geo	Volume				Value			
	%contri	Sales	% Ach	AMS	%contri	Sales	% Ach	AMS
South Zone		20,356	105%	27%		1,154	105%	29%
Andhra Pradesh	28%	5,793	108%	29%	29%	329.6	108%	32%
Karnataka	25%	5,179	105%	27%	25%	291.7	105%	29%
Kerala	16%	3,188	105%	34%	15%	176.6	105%	36%
Tamil Nadu	30%	6,197	102%	22%	31%	356.4	102%	24%

Internal state-sales data shows that the sales of Ryzodeg is growing on an average by more than 25%. In which Karnataka and Tamil Nadu are lowest in growth. Both regions have large market size of insulin. Increasing demand of the MI+NGI may lead to cover and gain more revenue from the larger markets. Andhra Pradesh is also big customer cluster.

	Manpower	YTD Feb'20	Contr.	PCPM	iPCPM	AMS Growth	2019
TN	51	356	10.6%	3.5	0.7	24%	1723
KA	42	291.7	11.3%	3.5	0.8	29%	1355
KL	45	176.6	5.8%	2.0	-1.2	36%	1723
AP	55	329.6	11.9%	3.0	0.7	32%	1498
SOUTH	193	1154.3	9.8%	3.0	0.7	29%	5353

Productivity of Kerala has been gone down, but parallelly sales growth is highest in all south zone. Due to smaller market size, Kerala contribution is low in comparison with other states. And also it is impacted on its per capita per month (PCPM).



Major prescribers of Ryzodeg are Cardiologist, Endocrinologist, Diabetologist and General Physician. For prescriber growth general physicians are growing by 25%, Endocrinologist and Cardiologist by 3%, and Diabetologist by 5%. Which means new doctors are starting to prescribe Ryzodeg who are not prescribing it before. Average prescriptions per doctor per month is highest for cardiologist, Diabetologist and Endocrinologist. Whereas average prescriptions per doctor is less for general physician but number new prescribers are more for the same category. Considering current lead-generation data, Ryzodeg prescribers are growing by approx. 6%. There is degrowth in cardiologist category, but Diabetologist, and physicians are growing by 10%.

Conclusion

From rapid acting insulin, Basal Insulins and Premix Insulin, Premix insulins are most suited and required to the Indian reality because of high carb diet in India. As per Indian reality, carbohydrate content in Indian diet is 2X as compared to western diet; which is contributing to high PPG levels. From Indian Diabetes Care Index, it is observed that the average PPG level in India is ~251 mg/dl against the target of 160 mg/dl. And to address the Indian reality of high carbohydrate diet, choice of Insulin therapy should control both PPG and FPG. Therefore aiming for total control becomes important. Premix insulins are the right suited for Indian reality of high carbohydrate diet which provide Total control. Ryzodeg provides 1.4% reduction in HbA1c from the baseline which is significantly superior as compared to IGLar U100 and also provides additional PPG control of 57 mg/dl. Coming to market scenario of Ryzodeg, overall growth of 20% shows the great user satisfaction and its effectiveness in Total control of PPG and FPG level. Major prescribers; cardiologist, diabetologist, endocrinologist and general physicians; are now shifting to the premix insulins from human insulins especially prescribing Ryzodeg instead of Novomix. Internal sales data shows that Tamil Nadu and Karnataka are losing their major prescribers. In Karnataka, Eli-Lilly is growing in comparison with Novo Nordisk – Ryzodeg. In some region, the focus on specialist doctor is less due to which Ryzodeg prescribers are degrowing. Ryzodeg is very unique product which gives better outcome, and also with lower volume it gives higher revenue contribution, eventually which helps in business growth.

Suggestions

The focus on General Physician is more. To expand the market for Ryzodeg, need to focus on specialities, medical colleges, and corporate hospital, where the usage is more. Targeting medical colleges is more beneficial because the future doctors, masters students, are at least aware about the product and will prescribe in future. Small amount of price variation in Ryzodeg also leads to major impact on sales and revenue growth. Sometimes lack of knowledge or training of sales-team may lead to degrowth in sales. Therefore, Proper and regular training should be done. Number of promotional activities should be increased.

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