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PHARMACOVIGILANCE: A STATASTICAL STUDY OF ADVERSE DRUG REACTIONS OF INSULIN ANTIDIABETIC DRUG IN GANDHINGLAJ RURAL REGION

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ABSTRACT

Diabetes mellitus (DM) is a metabolic disorder that occurs in the body because if decreased insulin activity and insulin secretion. Pathological changes such as nephropathy, retinopathy and cardiovascular complication inevitably occur in the body with the progression of the disease. The aim was to assess the perception of risk for developing adverse drug reaction (ADRS) and knowledge in diabetic patients and why insulin causes side effects I.e., to find the adverse drug reaction insulin injection in diabetic patients. Sometimes insulin injection leads side effects like swelling of face, itching, rash, hypoglycemia, weight gain fluid retention. And that's why doesn't maintain sugar level in diabetic patients. Not cure any wounds. Like foot ulcer. It will spread because of increased level of sugar in blood. This study is important because adverse drug reaction of insulin injection identify, to avoid side effects of insulin. Patients taking insulin b injection regularly but it not shows actual effects. Due to improper guidelines to patients related to the way of insulin injection taking and duration. And diet of diabetic patients also improper site of injection it will leads the side effects. This study helps to reduce or overcome the side effects of insulin in diabetic patients. The survey was conducted in Gadhinglaj rural area (village). First of all, we selected the hospitals where diabetics patients are treated. In this survey we interacted with doctors to collect information about adverse drug reaction found in patient who are taking insulin

injection. we also find out which adverse drug reaction are frequently experienced all the data gathered. To observe some side effects of insulin injection. We came to the conclusion that diabetic patients I.e., insulin taking patients require extensive care as well as good counselling. Suggests the correct insulin injection technique is crucial for better glycemic control. Education and counselling on proper insulin pen injection technique. Give instruction to patient regarding the insulin delivery recommendation through insulin pen and current insulin injection practice.

Keywords: Diabetes mellitus, Hyperglycemia, Antidiabetic, Adverse drug reaction, Insulin Injection.

INTRODUCTION: The World Health Organization (WHO) defines pharmacovigilance as "The pharmacological science and activities related to the Detection, assessment, understanding and prevention of adverse of effect or any other drug related problems". Pharmacovigilance is the Process of monitoring evaluating the quality of the drug as well as recognizing preventing side effects medication "Monitoring for safety" In today, S atmosphere pharmacovigilance is pushing new frontier, Sis a good thing. Hence, we selected the topic of insulin side effects in Diabetic patients. As per the international diabetic, S federation, diabetes effects 74million adults in India of which around 40 % of them Seem to be insulin resistant. It's no longer adequate to just keep track of negative incidence, as well as efficiency and quality standard.

ADR Definition: An adverse drug reaction is a response to medicinal product which is noxious and unintended. Response in the context means that causal Relationship between medicinal product and an adverse effect is least a reasonable possibility.

DIABETES

Diabetes Mellitus also known as diabetes is a more metabolic disease which is becoming more deadly now days More people die because Of this. The disease is caused due to defect in insulin secretion. Diabetes mellitus is highly prevalent in Gadhinglaj is often needed for diabetes control. That is when pancreas does not produce sufficient Amount of insulin or when cells of body stop responding to produce insulin independent and gestational diabetes. With over million Diabetes patients, India has dubious distinction of being the diabetes capital of World. This no is rapidly increasing and as per various Estimates.

Diabetes types:

• Type 1 or insulin dependent diabetes mellitus

• Type 2 or Non-insulin dependent diabetes mellitus

• Gestational Diabetes Mellitus.

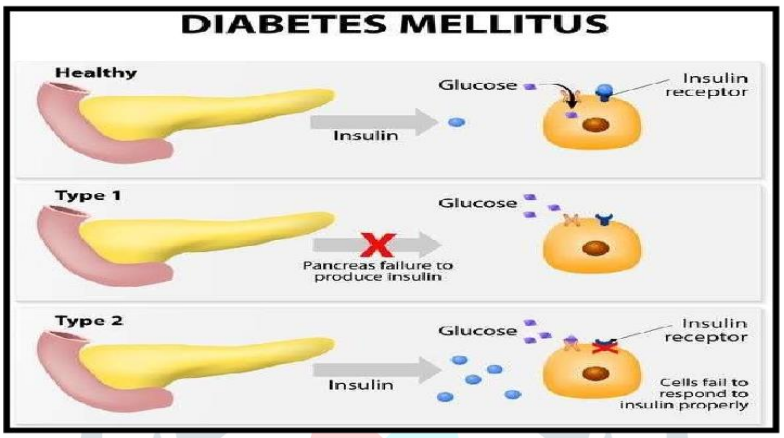


Fig.no1

Type 1 Diabetes

In this type, Insulin is completely absent due to pancreas lacking cells or containing defective cells. It occurs in genetically susceptible Individuals and they have complications like kidney dysfunction. Nerve impairment, cardiovascular complications as well as blindness. Failure of pancreas to produce insulin results in type 1 diabetes. This is mostly seen in children so this has traditional name called juvenile

Diabetes (Type 1- dependent) People with juvenile form of diabetes are completely dependent on external insulin immune system breaks the cells in their pancreas that Generate insulin.

Type 2 Diabetes

It is characterized by reduced insulin secretion in response to glucose level and insulin resistance which leads insufficient absorption of Diabetes Glucose into the cells for energy. It usually occurs in obese individual and it suppresses the synthesis of insulin receptor. Failure of cells to respond to insulin produced. Lifestyle and genetic of person have for major role here. It Is also hereditary disease which Follows for generation. This type occurs at any stage, unfortunately even in course of childhood. Type 2 diabetes is mostly seen to Surface during early 30'sand later. Women often are diagnosed with gestational diabetes during this pregnancy period. This condition usually goes away after childbirth but in few causes, it turns into type 2 diabetes Increases thirst and urination are usual Symptoms during gestational diabetes.

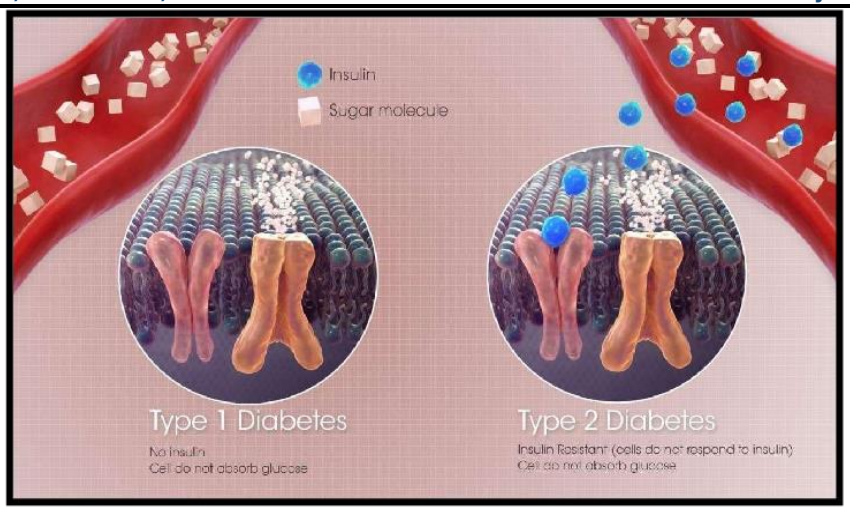


Fig. no2

Gestational diabetes mellitus

It is defined as any degree of glucose intolerance with onset or first recognition during pregnancy irrespective of the glycemic status after delivery. Gestational diabetes has increased the risk of type 2 diabetes mellitus and heart disease later in life. Be sides these genetic defects of B cell function also causes diabetes.

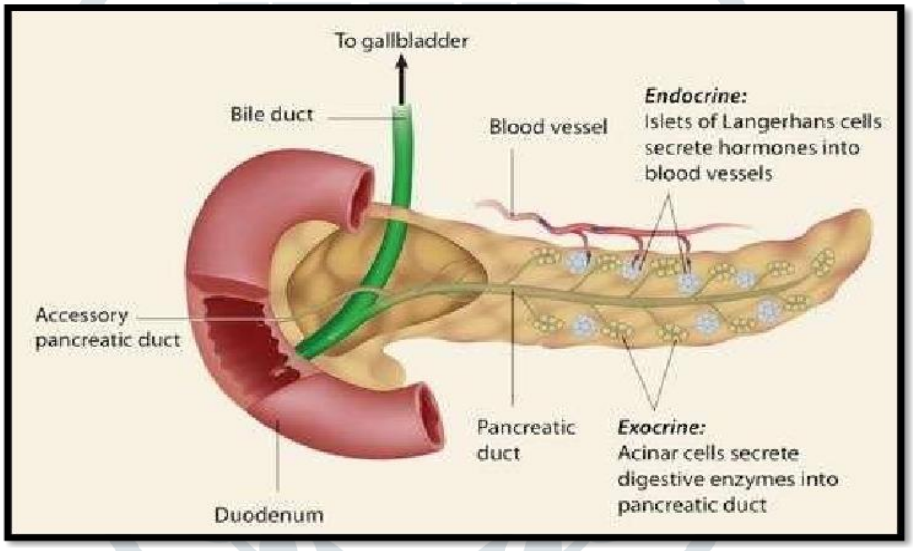


Fig.no3

INSULININ DIABETES:

Insulin is natural hormone produced by B cells of pancreas in non-diabetic individuals, the pancreas produces continuous supply of low Basal. Insulin level & spikes of insulin following meals. Increased insulin secretion following meals is responsible for the metabolic changes That occur the body transition from the post absorptive to an absorptive state. The appropriate insulin regimen for an individual patient Using should take into account the patient lifestyle, age, motivation, general health, self-management skills& treatment goals. Insulin is indispensable component of management of DM & proportion of patient using insulin vary from country to country. Correct Insulin injection technique is essential for better diabetic control. However, one of the large multinational surveys in 42 countries Showed that patient insulin injection technique was inappropriate. Studies of our countries showed a significant gap between insulin Injection administration guidelines& insulin injection.

MECHANISM OF ACTION OF INSULIN:

Insulin determines bind to insulin receptor a heterotetrametric protein consisting of two extracellular alpha units & two transmembrane Beta units. The bound receptor auto phosphoryl at numerous intracellular substance such as insulin receptor substrate (IRS) Proteins, CDT, APS, SHc, Gab 1. Activation of these proteins leads to activation of downstream signalling molecule including P13 kinase Act.

EDUCATION OBJECTIVE:

• The Major goals of pharmacovigilance are to demonstrate the efficacy of medication.

• Understanding the consideration underlying the initiations of insulin in diabetes.

• A study of adverse effect among people of various ages.

• Gain an insight into the specific insulin infusion technique & devices.

• Appreciate the factors important for deciding use of same in ICU settings

• Updating on the newer insulins.

Insuline Type	How it is delivered	Expiration when opened	On set	peak	duration
Rapid Acting					
Admelog	Vials and pens	28 days	15 to 30 min	30 min 2% HR	4 to 5 hours
Afrezzainhaled powder	4,8 and 12 unit catridges	3 days	3 to 7 min	12 to 15min	1 ½ 3 hours
Apidra	Vials and pens	28 days	10 to 20 min	30 Min ½ HR	2 to 4 hours
Fiasp	Vials and pens	28 days	15 to 20 min	1 ½ 2 Hours	5 hours
Humalog U100 and U200	Vials, pens cartridges for refillable pen	28 days	10 to 20 min	30 min ½ HR	3 to 5 hours
Novolog	Vials, pens cartridges for refillable pen	28 days	10 to 20 min	1 to 3 hours	3 to 5 hours
Short acting					
Regular	Vials and pens	31 to 42 days depending upon brand	15 to 30 min	2 ½ hours	4 to 12 hours
U500(5x Concentration	Vials and pens	28 days	30 min	4 to 8 hours	18 to 24 hours
Intermediate acting					
NPH (Createdin 1946)	Vials and pens	31 to 42 days depending upon brand	1 to 2 hours	4 to 12 hours	14 to 24 hours
Long acting					
Basaglar	Vials and pens	28 days	3 to 4 hours	No peak+	11 to 24 hours
Lantus	Vials and pens	28 days	3 to 4 hours	No peak+	11 to 24 hours
Levemir	Vials and pens	42 days	3 to 4 hours	No peak+	6 to 23 hours

Toujeo U300	Pen only	42 days	6 hours	No peak+	6 to 23 hours
Treaiba, U100 And U200	Pen only	56 days	1 hours	9 hours	36 to 42 hours
Combination					
NPH/Regular 70/30	Vials and pens	31 to 42 vial 10 D vials	30 min	50 min 2 hours and 6 to 10 hours	
Rapid acting 70/30	Vials and pens	28 D Vial 10 D pen	15 to 30 min	1 to 4 hours	18 to 24 hours
Rapid acting 75/25	Vials and pens	28 D Vial 10 D pen	15 to 30 min	1 to 6% hours	12 to 24 hours
Rapid acting 50/50	Vials and pens	28 D Vial 10 D pen	15 to 30 min		

MATERIAL AND METHOD:

The survey was conducted at Gadhinglaj rural area (village) first of all we have selected the hospitals where the diabetic patients commonly available. In present survey, we have interacted with expert doctors to collect the information about adverse drug reaction found in patient who are under diabetic medication. After successful completion of the survey. we came to know exacts scenario about drugs adverse drug reaction, we also found out which adverse drug reaction frequently experienced.

Sr.no	Activity	Rational
1	selection of disease	now a days most population is suffering from diabetes and they take insulin and it shows side effects so we have selected the topic to study the adverse drug reaction of insulin in patients
2	selection of hospital	we have selected the hospital where diabetes patients are treated
3	Questionnaire	Prepared question bank to collect the datafor the doctors the questions is related with patients adverse drug reaction found in antidiabetic medication which adverse drug reaction are frequently Experienced
4	Preparation of adverse drug reaction report	prepare the adverse drug reaction to collect information about the adverse drug reaction found in patient
5	data collection	data is collected with the help of survey form and questionnaire
6	study	study of data of adverse drug reaction records the information chart and plot the graph
7	compilation of data	study of patients gender, age. Sugar level ofthe patients insulin type and brands and their adverse drug

		reaction
8	conclusion on thattopic	Data collected and gives information abouthow to avoid insulin side effects.

SURVEY REPORT:

Out of a total of 500 diabetic patient who takes the insulin that attended the hospital during the study period. We found that 80 short Acting insulin patient who were taking 30 patient were taken Humulin and they having 200 –300 of 2 patient present adverse drug Reaction likewise 40 patients who were taking Novolin short acting insulin and 3 patients present with adverse drug reaction.10 patient Who were taking U500 SAI and in this type of insulin doesn‘t observe any side effect in patient.

For rapid acting insulin 4 out of 125 patients observed adverse drug reaction who we were taking insulin as part total 17 male patient are Observed it doesn’t cause any side effects. 29 patient who were taking glusine apidra had 1 patient with adverse drug reaction. 19 patient Who were taking lispro rapid acting insulin and it doesn’t show any side effects. 13 patient who were taking freeze 1 patient present with Adverse drug reaction 20 patient who were taking flaps rapid acting insulin it does not show any effects in patient.

Out of 75 patient taking intermediate acting insulins we found that 18 patient who were taking isophane had 1 patient present with Adverse drug reaction.15 patients who were taking glargine of patient present with adverse drug reaction. 19 patients taking NPH and 23 Patient staking insulin glargine bassaglar it doesn‘t show any side effects.

120 patients who were taking long-acting insulins. We found that 22 patients who were taking basaglar had 02 patients with adverse Drug reaction.27 patients taking degludec ,29 patients lanctus and 24 patients taking levemir it does not show any side effects. 18 Patients taking insulin glargine long-acting insulin 02 patients present with adverse drug reaction.

We found 100 patients who were taking combination type insulin 05 patients observed with adverse drug reaction.18 patients taking Novolog mix 70/25 it doesn‘t show any side effects. 21 patients who were taking metformin had03 patients with adverse drug Reaction.19 patients who were taking glimipride has 01 patient with adverse drug reaction.16 patients who were taking lisinopril it doesn‘t Show any side effects

According to our survey short acting insulin shows more side effect. Graph no 1showsthe drug and their Adr of short acting insulin. Graph no 2: Shows drug and their side effects of rapid acting insulin. Graph no 3:shows drug and their side effect intermediate acting insulin. Graph no 4: shows The Adverse drug reaction of long acting insulin. Graph no 5: shows the drug and their Adrs of combination acting insulin. Hence according to these Survey we observed insulin shows side effects and adverse drug reactions in patients.

Observation table no.1

Sr.no	Insulin type	Sugar level of patient	Total no of patient	Total no of adverse drug reaction
1	**Short acting insulin**			
	A) Humulin	150-300	30	2
	B) Novolin	150-300	40	3
	C)U500	150-300	10	-
2	**Rapid Acting Insulin**			
	A) Insuline as part			
	B) Glusine apidra	159-300	17	-1
	C) Lispro			
	D) Admelog	200-400	29	-2
	E) Afreeza	300-400	19	1

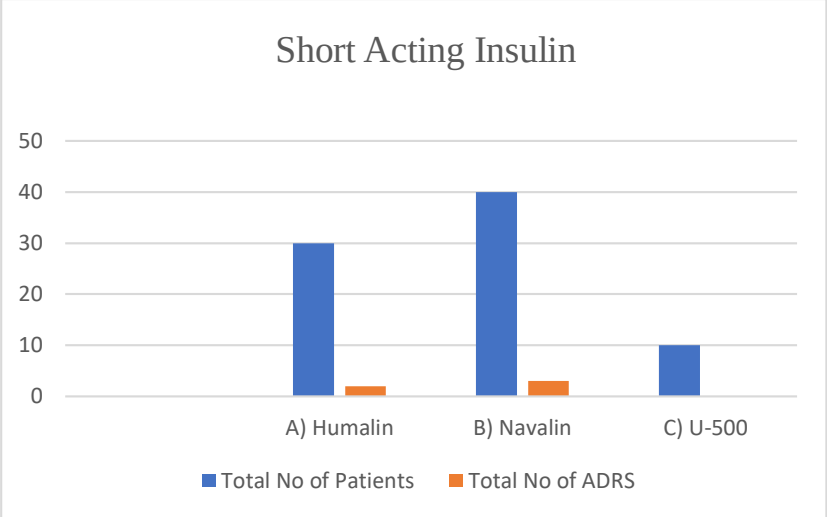
	F) Flasp	150-200 200-300 300-400	13 27 20	-		
3	**Intermediate acting insulin** A) Isophaneflumulin Novolin B) Glargine C)NPH D) Insulin Glargine Basaglar	200-400 200-400 200-400 200-400	18 15 19 23	1 1 - -		
4	**Long acting insulin** A) Basaglar B) Degludec C) Lantus D) Levemir E) Insulin Glargine	200-400 200-400 200-400 200-400 200-400	22 27 29 24 18	**2** - - **2** -		
5	**Combination Acting insulin** A) Novolog mix 70/30 B) Humalog mix 75/25 C) Metformin D) Glimepiride E) Lisinopril	- - - - -	18 26 21 19 16	**1** **3** **1** - -		
Sr.no	**Inuslin Drug**	**Age of Patient**	**Gender of Patient**	**Adverse effects**	**Total no of Patients**	**Total No of ADrs**
1	**Short acting insulin** A) Humulin B) Novolin C)U500	35 to 40 35 to 40 30 to 40	Male Male female	Hypoglycemic effects Low blood sugar Skin rashes	30 10 10	01 02 1
2	**Rapid Acting Insulin**					

	A) Insuline as part	30	Male	-	17	-1
	B) Glusine apidra	25 to 30	Male	Chest pain Swelling	29	-2
	C) Lispro	30 to 40	Male		19	1
	D) Admelog	50 to 60	Male	Face	13	-
	E) Afreeza		Male	-	27	-
				Upper respiratory	20	-
	F) Flasp		Male	-		
3	**Intermediate acting insulin**					
	A) Isophaneflumulin Novolin	40 to 50	Male	Fluid retension	18	1
					15	1
	B) Glargine	40 to 50	Male	Musle weakness	19	00
	C)NPH	40 to 50	Male			
	D) Insulin Glargine Basaglar	40 to 50	Male	Rapid weight gain	23	00
4	**Long acting insulin**					
	A) Basaglar	30 to 40	Male	Tingling of hand or feet	22	2
	B) Degludec	30 to 40	Male		27	-
	C) Lantus	30 to 40	Male	-	24	-
	D) Levemir	30 to 40	Male	-	29	-
	E) Insulin Glargine	30 to 40	Male	-	18	2
				Allergic reaction swelling		
5	**Combination Acting insulin**					
	A) Novolog mix 70/30	40 to 50	Male	Skin thickening	18	1
	B) Humalog mix 75/25	40 to 50	Male	-	26	-
	C) Metformin	40 to 50	Male	Nausea, vomiting Loss of appetite	21	3
	D) Glimepiride	40 to 50	Male		19	1
	E) Lisinopril	40 to 50	Male	-	16	-

Observation table no.2

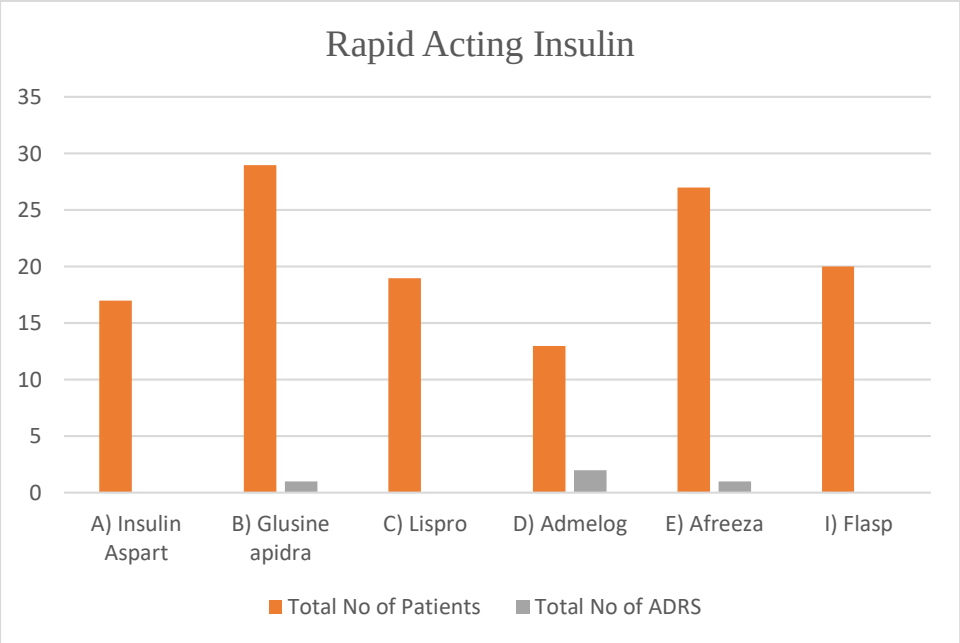
Result and Discussion:

Sr no	Particulars	Insulin Type	Total No of Patients	Total No of ADRS
1	Short Acting Insulin			
		A) Humalin	30	2
		B) Navalin	40	3
		C) U-500	10	0



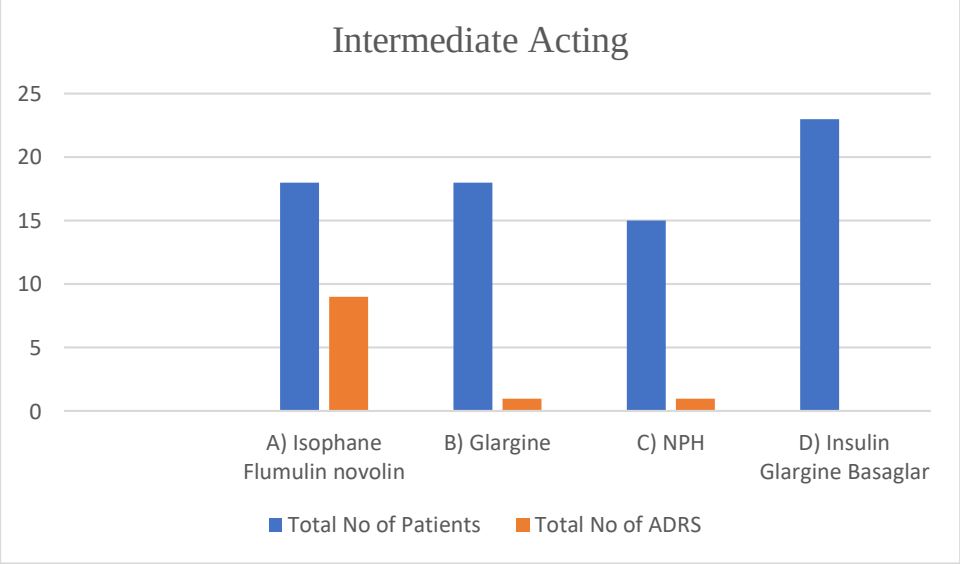
Graph no.1

Sr no	Particulars	Insulin Type	Total No of Patients	Total No of ADRS
2	Rapid Acting Insulin			
		A) Insulin Aspart	17	0
		B) Glusine apidra	29	1
		C) Lispro	19	0
		D) Admelog	13	2
		E) Afreeza	27	1
		I) Flasp	20	0



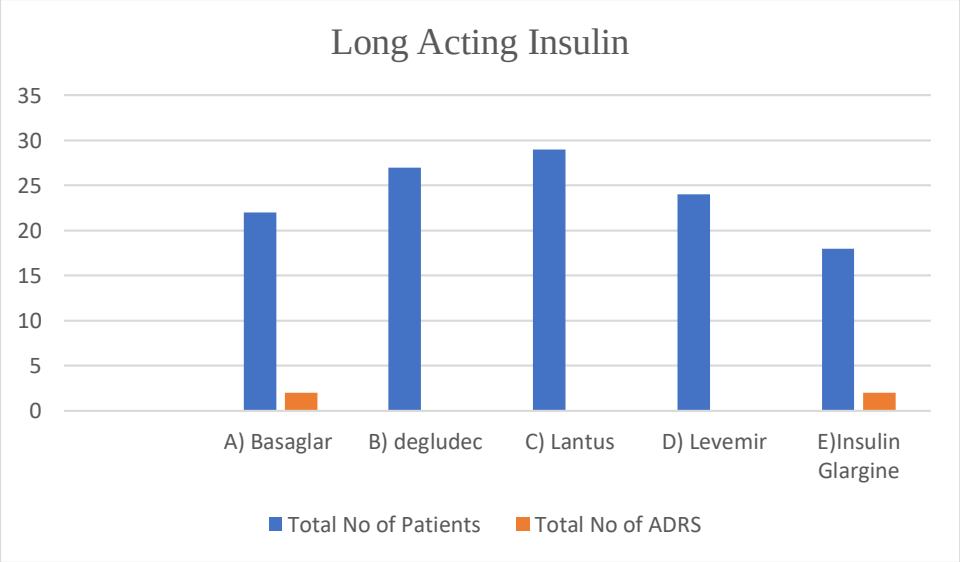
Graph no.2

Sr no	Particulars	Insulin Type	Total No of Patients	Total No of ADRS
3	Intermediate Acting			
		A) Isophane Flumulin novolin	18	9
		B) Glargine	18	1
		C) NPH	15	1
		D) Insulin Glargine Basaglar	23	0



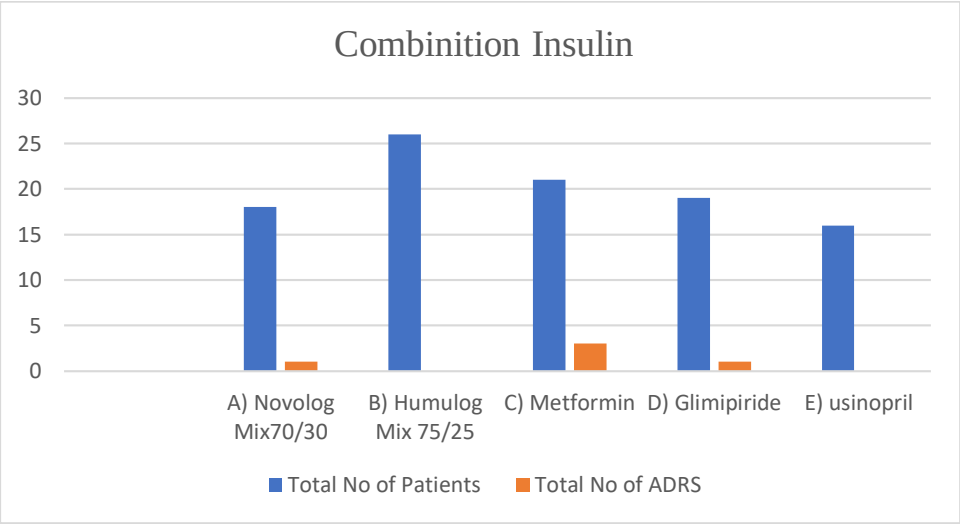
Graph no.3

Sr no	Particulars	Insulin Type	Total No of Patients	Total No of ADRS
4	Long Acting			
		A) Basaglar	22	2
		B) degludec	27	0
		C) Lantus	29	0
		D) Levemir	24	0
		E)Insulin Glargine	18	2



Graph no.4

Sr no	Particulars	Insulin Type	Total No of Patients	Total No of ADRS
5	Combinition			
		A) Novolog Mix70/30	18	1
		B) Humulog Mix 75/25	26	0
		C) Metformin	21	3
		D) Glimipiride	19	1
		E) usinopril	16	0



Graph no.5

CONCLUSION

We come to the conclusion in the case of short acting insulin shows side effects, also other insulin shows side Effects. hence according to our survey correct insulin technique, patient counselling is important to avoid Adverse Drug reactions. Correct insulin injection technique is crucial for better glycemic control. Give instruction to patients regarding the insulin deliver Recommendation through insulin pen and current insulin injection practice. Education counselling on proper insulin pen injection technique should be provided to patients with diabetes using insulin. The insulin education that was provided to most of them was found to be Insufficient and almost ineffective there is scope of for improving these lessening injection complication and improving glycemic states. The results of the current study may serve as backbone of the template on which difference corrective strategies may be developed insufficient Future. With rapidly accumulating evidence on various aspect of diabetes care including landmark clinical trials of agents and newer Technologies. This study utilizes authorized guidelines as part of diabetes care and these updates therefore need more attention.

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