



Original Article

Adverse Drug Reaction Profiling of Antidiabetics, Antianginals and Antibiotics based on Hospital SurveySk Md Khalid¹, Mayukh Sarkar^{1,*}¹Assistant Professor, Eminent College of Pharmaceutical Technology, Moshpukur, Barbaria, Barasat, P.O. Jagannathpur, 24 Parganas (North), 700126, Kolkata, India

ARTICLE INFO

Article history:

Received 10.06.2022

Revised 29.07.2022

Accepted 06.08.2022

Published 08.12.2022

* Corresponding author.

Mayukh Sarkar

mayukhsrkr4u@gmail.com[https://doi.org/](https://doi.org/10.18579/jopcr/v21i3.2)

10.18579/jopcr/v21i3.2

ABSTRACT

The objective of this survey is to monitor the different Adverse Drug Reactions experienced by the patients treated with antidiabetics, antianginals and antibiotics from different hospitals. Adverse Drug Reaction profile or ADR was done mainly for monitoring the expected, unexpected side effects of a medication or combinations of medications. ADR profiling was done by healthcare professionals of different hospitals and clinical centers. ADR Profiling aimed to identify and quantify the risks associated with the use of drugs dispensed in a hospital setting. In this survey the ADR profiling was done with the help of hospital pharmacists from different Government and Private Hospitals across Kolkata, West Bengal. This survey only focused on the ADR Profile of antidiabetics, antianginals and Antibiotics. Some observed side effects of the report included antidiabetics having weight gain, nausea, vomiting. Antianginals showed symptoms of dizziness, fatigue, and headache. Whileside effects of antibiotic drugs included skin rash, itching and other allergic reactions. A comprehensive compilation of the work has been reported for guidance of healthcare professionals with an aim to encourage rational drug therapy and rational use of these categories of drugs and take appropriate remedial measures to improve quality of life of patients.

Keywords: ADR Profile; Antidiabetics; Antianginals; Antibiotics

INTRODUCTION

Adverse Drug Reaction (ADR) Profile

All toxic and unintended responses to a medicine related to any dose level are considered as adverse drug reactions.¹

Globally adverse drug reactions (ADRs) make a great impact on human health. Introducing a systematic approach could resolve these problems. Formalized monitoring was developed to diagnose and take action as a strategy to respond against these problems. Every year new kinds of drugs emerges which come with their own ADRs. Sometimes these ADRs could be minor at the other it could be life-threatening. So monitoring the ADRs is an important duty of the regulatory authorities.

It is crucial that hospitals and other organizations take advantage of these tools which can help improve how medicines are managed. ADRs has been developed with the help of healthcare professionals to help hospital staff take a structured approach to the monitoring of medicines, identifying any ADRs and then making changes to improve

a patient's health and wellbeing.

ANTIDIABETIC DRUGS

Antidiabetics are those agents which help to lower the high blood glucose level.

Diabetes is not a single disease. Rather, it is a combination of syndromes characterized by elevated blood glucose attributed to a relative or absolute deficiency of glucose.

Diabetes is classified into two types -

Type 1 diabetes — It is the most common type, characterized by an absolute deficiency of insulin due to destruction of β cells. Without functional β cells, the pancreas fails to respond to glucose. Persons with type 1 diabetes show classic symptoms of insulin deficiency.²

Type 2 diabetes – It is characterized by a lack of insulin sensitivity of target organs. In type 2 diabetes, the

pancreas sustains some β cell function, but insulin secretion is insufficient to maintain glucose homeostasis due to increasing peripheral insulin resistance.

Antidiabetic drugs do not cure diabetes; rather they help diabetics to keep their blood glucose level under control resulting in lower risk of complications. Type 1 diabetes patients daily need insulin injections to maintain health. Whereas in type 1 diabetes patients exogenous insulin is administered to substitute for absent insulin secretion.

Oral anti-diabetic drugs are useful in the treatment of patients with type 2 diabetes that is not controlled with diet. Patients with chronic state of disease may require a combination of oral drugs with or without insulin to control hyperglycemia.³

Sulfonylureas

Sulfonylureas stimulate release of insulin from the β cells of the pancreas. Sulfonylureas block ATP-sensitive K^+ channels, resulting in depolarization, Ca^{2+} influx and insulin exocytosis. In addition sulfonylureas may reduce hepatic glucose production and increase peripheral insulin sensitivity.⁴

Glinides

Glinides bind to a distinct site on the β cell, closing ATP-sensitive K^+ channels, and initiating a series of reactions that result in the release of insulin.

Biguanides

Metformin is the most commonly used Biguanides. It works by reducing the rate of hepatic gluconeogenesis. Metformin also slows intestinal absorption of sugars and improves peripheral glucose uptake and utilization.

Thiazolidinediones (TZDs)

The TZDs lower insulin resistance by acting as agonist for the peroxisome proliferator-activated receptor- γ (PPAR γ), a nuclear hormone receptor. Activation of PPAR γ regulates the transcription of some insulin responsive genes, resulting in increased insulin sensitivity in adipose tissue, liver and skeletal muscle.⁵

α -Glucosidase inhibitors

Located in the intestinal brush border, α -Glucosidase enzymes break down carbohydrates into glucose and other simple sugars that can be absorbed.

Dipeptidyl peptidase-4 inhibitors

These drugs inhibit the enzyme DPP-4 which is responsible for the inactivation of incretin hormone such as GLP-1. Prolonging the activity of incretin hormones increases insulin release in response to meals and reduces inadequate secretion of glucagon.⁶

ANTIANGINAL DRUGS

Antianginal drugs are those that prevent, abort or terminate attacks of angina pectoris. Angina pectoris or angina is a pain syndrome due to induction of an adverse oxygen supply or demand situation in a portion of the myocardium. Metabolites that accumulate due to myocardial ischemia elicit the pain. Angina pectoris has different patterns -

Classical angina is one of them. Classical angina is the most common form of angina and therefore known as angina pectoris. It is usually characterized by a short-lasting burning, heavy or squeezing feeling in the chest.

Another pattern is unstable angina. In this chest pain frequency increases, the intensity and duration are precipitated by progressively less effort.

Prinzmetal angina is an uncommon pattern of episodic angina, which occurs at rest due to coronary artery spasm.⁷

Drugs used in angina exploit two main strategies, one being reduction of oxygen demand and another one is increase of oxygen delivery to the myocardium.

Different types of drugs are used in angina. Some of them are -

Nitrates

The organic nitrate agents are prodrugs that are sources of nitric oxide (NO). NO activates the soluble isoform of cGMP. In turn, cGMP promotes the dephosphorylation of the myosin light chain and the reduction of cytosolic Ca^{2+} and leads to the relaxation of smooth muscle cells in a broad range of tissues. Some examples of nitrates are Glyceryl trinitrate, Isosorbide dinitrate, Isosorbide mononitrate.⁸

β Blockers

The β -adrenergic blockers decrease the oxygen demands of the myocardium by blocking β_1 receptors, resulting in decreased heart rate, contractility, cardiac output, and blood pressure. Atenolol, metoprolol, propranolol are some examples of β blockers.

Calcium Channel Blockers

The calcium channel blockers (CCB) decrease intracellular availability of Ca^{2+} by blocking its entry and thus allow blood vessels to relax.

In ischemia calcium influx increases due to membrane depolarization that produces hypoxia. The CCB protect tissue by blocking the entrance of calcium into cardiac and smooth muscle cells of the coronary and systemic arterial beds and decreases the smooth muscle tone and vascular resistance, afterload.

Sodium Channel Blocker

Ranolazine inhibits the late phase of sodium current (I_{Na}), improving the oxygen supply and demand equation. Inhibition of late I_{Na} reduces intracellular sodium and

calcium overload, thereby improving diastolic function.

ANTIBIOTICS

Antibiotics are those drugs, which prevent infection caused by bacteria in human beings by either killing the bacteria or making it difficult to grow or multiply.⁹

Antibiotics can be classified by their spectrum of activity

- Narrow-spectrum agents (e.g., penicillin G) affect primarily gram-positive bacteria.

Broad-spectrum antibiotics, such as tetracyclines and cephalosporin, affect both gram-positive and some gram-negative bacteria.

An extended-spectrum antibiotic is chemically modified so that it acts on additional types of bacteria, belonging to gram-negative.¹⁰

Antibiotics work through a range of mechanisms of action. Maximum of them inhibit bacterial cell wall synthesis, and they are referred to as β -lactam antibiotics.

Other antibiotics, such as the aminoglycosides, chloramphenicol, erythromycin, and clindamycin, work by inhibiting protein synthesis in bacteria.

The antibiotics that are selectively toxic bind to or inhibit the function of the proteins of bacteria. They prevent the synthesis of new proteins and new bacterial cells.

Some other antibiotics bind to membrane phospholipids of the bacterial cell and interfere with selective barrier function of cell membrane. This causes leakage of essential macromolecules from the cell and death of the cell.

Some antibiotics, such as the sulfonamides, are competitive inhibitors of folic acid (folate) synthesis that is essential for synthesis of nucleic acids. Sulfonamides are able to inhibit folic acid synthesis because of structural similarity to para-aminobenzoic acid, an intermediate compound that is enzymatically converted to folic acid. The structural similarity of these compounds results in competition between sulfonamide and para-aminobenzoic acid for the enzyme responsible for converting the intermediate to folic acid.

METHODS

The survey was conducted as verbal interview of the healthcare staff of the hospital and the response were documented as a report. The healthcare personnel were asked about different drugs that are used by the patients in the hospital. The survey was performed on a weekly basis. It took nearly 6 months to complete the survey. The location where the survey was performed is given below;

1. Nil Ratan Sircar Medical College and Hospital (138, Acharya Jagadish Chandra Bose Rd, Sealdah, Raja Bazar, Kolkata, West Bengal- 700014)
2. RS V Hospital (40, Deshpriya Sasmal Rd, Tollygunge Phari, Tollygunge, Kolkata, West Bengal- 700033)

3. VIP APEX Medical Centre Pvt. Ltd. (Sachindralal Sarani, Joramandir H/1, 16, VIP Rd, Kolkata, West Bengal- 700059)

The format used for data collection is given below:-

1. Serial Number
2. Drug Name (Brand Name/Generic Name)
3. Manufacturer
4. Dose used
5. Route of Administration
6. Use
7. Frequency
8. Side effects

RESULT

The survey was conducted over a period of 6 months in three different hospitals across Kolkata, West Bengal. The results are presented in Tables 1, 2 and 3.

Table 1: Data collected from Nil Ratan Sircar Medical College and Hospital.

Antidiabetics								
Sl. No.	Drug (Brand/ Generic)	Name	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Metformin		Stadmed Pvt Ltd.	500, 1000mg	Oral	To prevent and treat type 2 diabetes	Twice daily	Nausea, vomiting, stomach upset
2	Glimepiride		Luxmi Pharmaceutical Works	1, 2mg	Oral	To treat type 2 diabetes	Twice daily	Hypoglycemia, dizziness, weight gain
3	Pioglitazone		Caplet Healthcare Pvt Ltd.	15mg	Oral	To treat type 2 diabetes	Once daily	weight gain, difficulty in urination
4	Galvus 50		Novartis India Pvt Ltd.	50mg	Oral	To treat type 2 diabetes	Once daily, twice daily	Headache, cough, constipation
5	Teneligliptin		Precise Chemipharma Pvt Ltd.	20mg	Oral	To treat type 2 diabetes	Once daily	Hypoglycemia, skin rash, loss of appetite
6	Voglibose		Bymaa Laboratories Pvt Ltd.	0.3mg	Oral	To treat diabetes mellitus by lowering postprandial blood glucose level	Twice daily	Hypoglycemia, abdominal distension
7	Regular Human Insulin		Novo Nordisk India Pvt Ltd.	40IU/ml	Sub-cutaneous	To reduce high blood sugar level in patients with diabetes	Once daily	Hypoglycemia, weight gain
8	Lantus		Sanofi India Ltd.	100IU/ml	Sub-cutaneous	To reduce high blood sugar level in patients with diabetes	Once daily	Headache, weakness
Antianginals								
Sl. No.	Drug (Brand/ Generic)	Name	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Glyceryl trinitrate		Salud Care India Pvt Ltd.	2.6mg	Oral	To treat angina	Twice daily	Itching, numbness, swelling
2	Isosorbide dinitrate		Unicare India Ltd.	5mg	Oral	To prevent chest pain caused by angina	Twice daily	Headache, temporary redness of face
3	Atenolol		Stadmed Pvt Ltd.	50mg	Oral	It can be used to prevent chest pain caused by angina.	Once daily	Tiredness, hypotension.
4	Propranolol		Olcare Laboratories	10, 20, 40mg	Oral	Helps to prevent chest pain caused by angina	Once daily, twice daily	Dizziness, tiredness, difficulty in sleeping
5	Metoprolol		Mascot Health Series Pvt Ltd.	25, 50mg	Oral	To treat high blood pressure and it helps to prevent anginal pain	Once daily	Hypotension, tiredness, dizziness

Continued on next page

Table 1 continued

6	Amlodipine	Tropical Laboratories	5, 10mg	Oral	To treat high blood pressure and to treat certain types of angina	Once daily	Headache, nausea, stomach upset
7	Ranolazine	Jackson Laboratory Pvt Ltd.	500mg	Oral	To treat chronic angina	Twice daily	Difficulty in breathing

Antibiotics

Sl. No.	Drug Name (Brand/Generic)	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Amoxicillin and potassium clavulanate	Rivpra Formulation Pvt Ltd.	Amoxicillin (500mg) + potassium clavulanate (125mg)	Oral	To treat bacterial infections	Thrice a day	Diarrhoea, vomiting, indigestion
2	Azithromycin	Gluconate Health Limited	500mg	Oral	To treat bacterial infections	Once daily	Diarrhoea, vomiting, stomach upset
3	Cefpodoxime	ZEE Laboratories Limited	200mg	Oral	To treat bronchitis, pneumonia, gonorrhoea	Twice daily	Sore throat, skin rash
4	Cefixime 100 DT	MenrikBiomerge Pvt Ltd.	100mg	Oral	To treat variety of bacterial infections	Twice daily	Diarrhoea, stomach pain
5	Cefixime	Bharat Parenterals Ltd.	200mg	Oral	Used to treat bronchitis, gonorrhoea	Twice daily	Diarrhoea, stomach pain, nausea
6	Ciprofloxacin	Diamond Drugs Pvt Ltd.	500mg	Oral	To treat chest, ear, eye infections	Twice daily	Diarrhoea, nausea, dizziness
7	Levofloxacin	Pacific Bioengineering Pvt Ltd.	500mg	Oral	To treat pneumonia, kidney infections	Once daily	Diarrhoea, nausea, tendon Problems
8	Linezolid	CI Laboratories	600mg	Oral	To treat pneumonia, skin infections	Twice daily	Diarrhoea, rash
9	Ofloxacin	Diamond Drugs Pvt Ltd.	200mg	Oral	To treat bacterial infections	Twice daily	Diarrhoea, stomach upset, nausea
10	Clarithromycin	CI Laboratories	50mg	Oral	To treat pneumonia, bronchitis	Twice daily, thrice a day	

Table 2: Data collected from RSV Hospital

Antidiabetics								
Sl. No.	Drug (Brand/ Generic)	Name	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Glyciphage SR		Franco Indian Pharmaceuticals Pvt Ltd.	Metformin (500, 1000mg)	Oral	To treat type 2 diabetes	Twice daily	Nausea, vomiting, stomach upset
2	Amaryl		Sanofi India Ltd.	Glimepiride (1, 2mg)	Oral	To treat type 2 diabetes	Twice daily	Dizziness, weight gain
3	Pioz		USV Ltd.	Pioglitazone (15 mg)	Oral	To treat type 2 diabetes	Once daily	Difficulty in urination, weight gain
4	Galvus 50		Novartis India Pvt Ltd.	Vildagliptine (50mg)	Oral	To treat type 2 diabetes	Once daily, twice daily	Headache, cough, constipation
5	Tegliptin		Alkem Laboratories Ltd.	Teneligliptine (20mg)	Oral	To treat type 2 diabetes	Once daily	Hypoglycemic, skin rash, loss of appetite
6	Volibo		Sun Pharmaceutical Industries Ltd.	Voglibose (0.3mg)	Oral	To treat diabetes mellitus by lowering post-prandial blood glucose level	Once daily, twice daily, thrice a day	Diarrhoea
7	Human Actrapid		Novo Nordisk India Pvt Ltd.	Insulin 40IU/ml	Subcutaneous	To reduce high blood sugar level in patients with diabetes	Once daily	Hypoglycemia, weight gain
Antianginals								
Sl. No.	Drug (Brand/ Generic)	Name	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Imdur		Astra Zeneca	Isosorbide mononitrate (15, 30mg)	Oral	To prevent chest pain caused by angina	Twice daily	Headache and temporary redness of face
2	Sorbitate 5		ABBOTT	Isosorbide dinitrate (5, 10mg)	Oral	To prevent chest pain caused by angina	Twice daily, thrice a day	Tiredness, hypotension
3	Dilzem 30		Torrent Pharmaceuticals Ltd.	Diltiazem (30mg)	Oral	To prevent anginal pain	Once daily	Headache, constipation, dizziness, fatigue
4	Nicardia Retard 20		JB Chemicals and Pharmaceuticals Ltd.	nifedipine (20mg)	Oral	To treat and prevent angina	Twice daily	Dizziness, edema, fatigue
5	Calaptin 120 SR		ABBOTT	Verapamil (120mg)	Oral	To treat high blood pressure and severe angina	Once daily, twice daily	Constipation, dizziness, nausea
6	Aten		ZydusCadila	Atenolol (25, 50mg)	Oral	It helps to treat high blood pressure, chest pain	Twice daily	Fatigue, nausea, diarrhea
7	Inderal		ABBOTT	Propranolol (10, 20 and 40mg)	Oral	To treat high blood pressure and heart related chest pain	Once daily, twice daily	Tiredness, weakness, diarrhea

Continued on next page

Table 2 continued

8	Met XL 25	Ajanta Pharma Ltd.	Metoprolol (25mg)	Oral	To treat high blood pressure and heart related chest pain	Twice daily	Fatigue, headache, slow heart rate
9	Stamlo 5	Dr Reddy's Laboratories Ltd.	Amlodipine (5mg)	Oral	To treat high blood pressure and heart related chest pain	Once daily	Headache, fatigue, nausea
10	Nikorin 5	Torrent Pharmaceuticals Ltd.	Nicorandil (5mg)	Oral	To prevent and treat heart related chest pain	Twice daily	Headache, nausea, vomiting
11	Ranozex 500	Sun Pharmaceutical Industries Ltd.	Ranolazine (500mg)	Oral	Used for the management of angian	Twice daily	Headache, constipation, dizziness

Antibiotics

Sl. No.	Drug Name (Brand/ Generic)	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Augmentin 625	Glaxo Smith Kline Pharmaceuticals Ltd.	Amoxicillin (500mg) + potassium clavulanate (125mg)	Oral	To treat bacterial infections	Thrice a day	Diarrhoea, vomiting, indigestion
2	Azithral 500	Alembic Pharmaceuticals Ltd.	Azithromycin (500mg)	Oral	To treat bacterial infections	Once daily	Diarrhoea, vomiting, stomach upset
3	Doxcef CV 200	Lupin Ltd.	Cefpodoxime (200mg)	Oral	Used to treat bronchitis, gonorrhoea	Twice daily	Diarrhoea, nausea, stomach pain
4	Cifran 500	Sun Pharmaceutical Industries Ltd.	Ciprofloxacin (500mg)	Oral	It is used in the treatment of the urinary tract, nose, throat, skin infection.	Twice daily	Diarrhoea, nausea
5	Loxof 500	Pfizer Ltd.	Levofloxacin (500mg)	Oral	It is used in the treatment of the urinary tract, nose, throat infection.	Once daily	Diarrhoea, nausea, constipation
6	Dalacin C	Pfizer Ltd.	Clindamycin (300mg)	Oral	It is used to treat variety of bacterial infections	Twice daily	Diarrhoea, vomiting, nausea
7	Lizolid 600	IntegracePvt Ltd.	Linezolid (600mg)	Oral	To treat pneumonia, skin infections	Twice daily	Vomiting, headache, nausea
8	Zanocin	Sun Pharmaceutical Industries Ltd.	Ofloxacin (200mg)	Oral	To treat bacterial infections	Twice daily	Diarrhoea, nausea
9	Claribid 500	ABBOTT	Clarithromycin (500mg)	Oral	To treat bacterial infections	Twice daily, thrice a day	Diarrhoea, headache, abdominal pain
10	Taxim O 200	Alkem Laboratories Ltd.	Cefixime (200mg)	Oral	To treat pneumonia, gonorrhoea	Twice daily	Diarrhoea, nausea, stomach pain

Table 3: Data collected from VIP APEX Medical Centre

Antidiabetics							
Sl. No.	Drug Name (Brand/ Generic)	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Trajenta 5	Boehringer-Ingelheim	Linagliptine (5mg)	Oral	Helps to control blood sugar level	Once daily	Cough, vomiting, Diarrhoea
2	Ondero 5	Lupin Ltd.	Linagliptine (5mg)	Oral	Helps to control blood sugar level	Once daily	Cough, vomiting, Diarrhoea
3	Trajenta DUO	Boehringer-Ingelheim	Metformin (500) + Linagliptin (2.5mg)	Oral	Plays a vital role in controlling blood sugar level.	Twice daily	Hypoglycemia, nausea, vomiting
4	Ondero Met	Lupin Ltd.	Metformin (500) + Linagliptin (2.5mg)	Oral	Plays a vital role in controlling blood sugar level	Twice daily	Hypoglycemia, nausea, vomiting
5	Glyciphage SR	Franco Indian Pharmaceuticals Pvt Ltd.	Metformin (500, 1000mg)	Oral	To treat type 2 diabetes	Twice daily	Nausea, vomiting, stomach upset
6	Glycomet 500 SR	USV Ltd.	Metformin (500mg)	Oral	To treat type 2 diabetes	Twice daily	Nausea, vomiting, stomach upset
7	Gluconorm SR 500	Lupin Ltd.	Metformin (500mg)	Oral	To treat type 2 diabetes	Twice daily	Nausea, vomiting, stomach upset
8	Metsmall 500 Tablet SR	Dr Reddy's Laboratories Ltd.	Metformin (500mg)	Oral	To treat type 2 diabetes	Twice daily	Nausea, vomiting, stomach upset
9	Glyciphage PG 2	Franco Indian Pharmaceuticals Pvt Ltd.	Glimepiride (2mg) + Metformin (500) + Pioglitazone (15mg)	Oral	To treat type 2 diabetes	Once daily	Hypoglycemia, dizziness, headache
10	Gemer 1	Sun Pharmaceutical Industries Ltd.	Glimepiride (1mg) + Metformin (500mg)	Oral	To treat type 2 diabetes	Once daily	Hypoglycemia, nausea, vomiting
11	Glycomet GP 1	USV Ltd.	Glimepiride (1mg) + Metformin (500mg)	Oral	To treat type 2 diabetes	Once daily	Hypoglycemia, nausea, vomiting
12	Galvus 50	Novartis India Ltd.	Vildagliptin (50mg)	Oral	To treat type 2 diabetes	Once daily, twice daily	Dizziness, headache, nausea
13	Galvus Met	Novartis India Ltd.	Metformin (500) + vildagliptin (50mg)	Oral	To treat type 2 diabetes mellitus	Once daily, twice daily	Hypoglycemia, headache, nausea
14	Zita Met Plus	Glenmark Pharmaceuticals Ltd.	Metformin (500mg) + Teneligliptin (20mg)	Oral	To treat type 2 diabetes mellitus	Once daily	Hypoglycemia, headache, nausea
15	Tenglyn	ZydusMedica	Teneligliptin (20mg)	Oral	To treat type 2 diabetes	Once daily	Constipation, stomach ache, nausea

Continued on next page

Table 3 continued

16	Dynaglipt 20	Mankind Pharma Ltd.	Teneligliptin (20mg)	Oral	To treat type 2 diabetes	Once daily	Constipation, stomach ache, nausea
17	Jardiance 10	Boehringer-Ingelheim	Empagliflozin (10mg)	Oral	It helps control the high blood sugar levels seen in diabetes	Once daily	Nausea, frequent urge to urinate
18	Volibo	Sun Pharmaceutical Industries Ltd.	Voglibose (0.2mg)	Oral	To treat diabetes mellitus by lowering post-prandial blood glucose level	Once daily	Hypoglycemia, weight gain
19	Pioz 15	USV Ltd.	Pioglitazone (15mg)	Oral	To treat type 2 diabetes mellitus	Once daily	Hypoglycemia, edema
20	Lantus	Sanofi India Ltd.	Insulin glargine (100IU)	Subcutaneous	To treat types 1 and 2 diabetes mellitus.	Once daily	Hypoglycemia, high blood pressure
21	Basugine	Lupin Ltd.	Insulin glargine (100IU)	Subcutaneous	To treat types 1 and 2 diabetes mellitus	Once daily	Hypoglycemia, high blood pressure
22	Novomix 30	Novo Nordisk India Pvt Ltd.	Insulin aspart (30%) + Insulin aspart protamine (70%)	Subcutaneous	To treat types 1 and 2 diabetes mellitus	Once daily	Hypoglycemia
23	Human Actrapid	Novo Nordisk India Pvt Ltd.	Human Insulin (40IU/ml)	Subcutaneous	To treat types 1 and 2 diabetes mellitus	Once daily	Hypoglycemia
24	Human Mixtard 70/30	Novo Nordisk India Pvt Ltd.	Insulin isophane (70%) + Human insulin(30%)	Subcutaneous	To treat types 1 and 2 diabetes mellitus	Once daily	Hypoglycemia

Antianginals

Sl. No.	Drug Name (Brand/ Generic)	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Nitrolong 2.6 Tablet CR	Mankind Pharma Ltd.	Nitroglycerin (2.6)mg	Oral	To treat angina	Twice daily	Itching, numbness, swelling
2	Sorbitate	ABBOTT	Isosorbide dinitrate (5mg)	Oral	To prevent chest pain caused by angina	Twice daily	Dizziness, headache, nausea
3	Monotrate 10	Sun Pharmaceutical Industries Ltd.	Isosorbide montrate (10mg)	Oral	To prevent chest pain caused by angina	Twice daily	Headache, dizziness
4	Depin 5	ZydusCadila	Nifedipine (5mg)	Oral	To treat heart pain caused by angina	Twice daily	Dizziness, fatigue
5	Nicardia 5	JB Chemicals and Pharmaceuticals Ltd.	Nifedipine (5mg)	Oral	To treat heart pain caused by angina	Twice daily	Dizziness, fatigue
6	Aten	ZydusCadila	Atenolol (25,50mg)	Oral	It helps to treat high blood pressure, chest pain	Twice daily	Fatigue, nausea, dizziness
7	Tenolol	Ipcalaboratories Ltd.	Atenolol (25,50mg)	Oral	It helps to treat high blood pressure, chest pain	Twice daily	Fatigue, nausea, dizziness

Continued on next page

Table 3 continued

8	Betaloc 25	Astra Zeneca	Atenolol (25mg)	Oral	It helps to treat high blood pressure, chest pain	Twice daily	Fatigue, nausea, dizziness
9	Inderal 40	ABBOTT	Propranolol (40mg)	Oral	To treat high blood pressure and heart related chest pain	Once daily, twice daily	Dizziness, tiredness
10	Stamlo 5	Dr Reddy's Laboratories Ltd.	Amlodipine (5mg)	Oral	To treat high blood pressure and heart related chest pain	Twice daily	Headache, fatigue, nausea
11	Amlodac 5	ZydusCadila	Amlodipine (5mg)	Oral	To treat high blood pressure and heart related chest pain	Twice daily	Headache, fatigue, nausea
12	Amlokind 5	Mankind Pharma Ltd.	Amlodipine (5mg)	Oral	To treat high blood pressure and heart related chest pain	Twice daily	Headache, fatigue, nausea
13	Ranozex Tablet ER	Sun Pharmaceutical Industries	Ranolazine (500mg)	Oral	Used for the management of angina	Twice daily	Nausea, vomiting, headache
14	Ranolaz Tablet SR	Torrent Pharmaceuticals Ltd.	Ranolazine (500mg)	Oral	Used for the management of angina	Twice daily	Nausea, vomiting, headache

Antibiotics

Sl. No.	Drug Name (Brand/ Generic)	Manufacturer	Dose used	Route of Administration	Use	Frequency	Side effects
1	Faronem 200	Sun Pharmaceutical Industries Ltd.	Faropenem (200mg)	Oral	Used in the treatment of lungs and urinary tract infections	Thrice a day	Diarrhoea, nausea, rash
2	Duonem 300 ER	ZydusCadila	Faropenem (300mg)	Oral	Used in the treatment of lungs and urinary tract infections	Thrice a day	Diarrhoea, nausea, rash
3	Lizolid 600	Integrace Pvt Ltd.	Linezolid (600mg)	Oral	To treat pneumonia, skin infections	Twice daily	Vomiting, headache, nausea
4	Linokem 600	Alkem Laboratories Ltd.	Linezolid (600mg)	Oral	To treat pneumonia, skin infections	Twice daily	Vomiting, headache, nausea
5	Lizoforce 600	Mankind Pharma Ltd.	Linezolid (600mg)	Oral	To treat pneumonia, skin infections	Twice daily	Vomiting, headache, nausea
6	Lizokef	Macloeds Pharmaceuticals Pvt Ltd.	Cefixime (200mg) Linezolid (600mg)	Oral +	To treat pneumonia, skin infections	Once daily	Diarrhoea, nausea, vomiting
7	Augmentin 625	Glaxo SmithKline Pharmaceuticals Ltd.	Amoxicillin (500mg) potassium clavulanate (125mg)	Oral +	To treat bacterial infections	Thrice a day	Diarrhoea, nausea, vomiting
8	Clavam 625	Alkem Laboratories Ltd.	Amoxicillin (500mg) potassium clavulanate (125mg)	Oral +	To treat bacterial infections	Thrice a day	Diarrhoea, nausea, vomiting

Continued on next page

Table 3 continued

9	Augpen 625 BID	Zuventus Healthcare Ltd.	Amoxicillin (500mg) + potassium clavulanate (125mg)	Oral	To treat bacterial infections	Thrice a day	Diarrhoea, nausea, vomiting
10	Clarimin 500	United Biotech Pvt Ltd.	Clarithromycin (500mg)	Oral	To treat bacterial infections	Twice daily	Diarrhoea, headache, nausea
11	Cetil 500	Lupin Ltd.	Cefuroxime (500mg)	Oral	It is used in the treatment of the urinary tract, nose, and throat infection.	Twice daily	Diarrhoea, nausea, vomiting
12	Zocef 500	Alkem Laboratories Ltd.	Cefuroxime (500mg)	Oral	It is used in the treatment of the urinary tract, nose, and throat infection.	Twice daily	Diarrhoea, nausea, vomiting
13	Pulmocef 500	Micro Labs Ltd.	Cefuroxime (500mg)	Oral	It is used in the treatment of the urinary tract, nose, and throat infection.	Twice daily	Diarrhoea, nausea, vomiting
14	Forcef 500	Aristo Pharmaceuticals Pvt Ltd.	Cefuroxime (500mg)	Oral	It is used in the treatment of the urinary tract, nose, and throat infection.	Twice daily	Diarrhoea, nausea, vomiting
15	Xoxe 500	Corona Remedies Pvt Ltd.	Cefuroxime (500mg)	Oral	It is used in the treatment of the urinary tract, nose, and throat infection.	Twice daily	Diarrhoea, nausea, vomiting
16	Taxim O 200	Alkem Laboratories Ltd.	Cefixime (200mg)	Oral	To treat bacterial infections	Twice daily	Nausea, stomach pain, indigestion
17	Monocef O 200	Aristo Pharmaceuticals Pvt Ltd.	Cefpodoxime (200mg)	Oral	To treat bacterial infections	Twice daily	Diarrhoea, nausea, rash
18	Cepodem 200	Sun Pharmaceutical Industries Ltd.	Cefpodoxime (200mg)	Oral	To treat bacterial infections	Twice daily	Diarrhoea, nausea, rash
19	Moxicip	Cipla Ltd.	Moxifloxacin (400mg)	Oral	To treat ear, eye infections	Once daily	Eye discomfort, dry eye
20	Moxam 400	Alkem Laboratories Ltd.	Moxifloxacin (400mg)	Oral	To treat ear, eye infections	Once daily	Eye discomfort, dry eye
21	Moxif 400	Torrent Pharmaceuticals Ltd.	Moxifloxacin (400mg)	Oral	To treat ear, eye infections	Once daily	Eye discomfort, dry eye
22	Loxof 500	Sun Pharmaceutical Industries Ltd.	Levofloxacin (500mg)	Oral	Used in the treatment of lungs and urinary tract infections	Once daily	Diarrhoea, nausea, headache
23	Glevo 500	Glenmark Pharmaceuticals Ltd.	Levofloxacin (500mg)	Oral	Used in the treatment of lungs and urinary tract infections	Once daily	Diarrhoea, nausea, headache
24	Leon 500	Dr Reddy's Laboratories Ltd.	Levofloxacin (500mg)	Oral	Used in the treatment of lungs and urinary tract infections	Once daily	Diarrhoea, nausea, headache
25	Alivo 500	Avail Healthcare	Levofloxacin (500mg)	Oral	Used in the treatment of lungs and urinary tract infections	Once daily	Diarrhoea, nausea, headache
26	Zanocin 200	Sun Pharmaceutical Industries Ltd.	Ofloxacin (200mg)	Oral	To treat bacterial infections	Twice daily	Nausea, headache, diarrhoea

Continued on next page



Table 3 continued

27	Oflox 200	Cipla Ltd.	Ofloxacin (200mg)	Oral	To treat bacterial infections	Twice daily	Nausea, headache, diarrhoea
28	OF 200	JB Chemicals and Pharmaceuticals Ltd.	Ofloxacin (200mg)	Oral	To treat bacterial infections	Twice daily	Nausea, headache, diarrhea
29	Azithral 500	Alembic Pharmaceuticals Ltd.	Azithromycin (500mg)	Oral	To treat a wide variety of bacterial infections	Once daily	Diarrhoea, nausea, vomiting
30	Azee 500	Cipla Ltd.	Azithromycin (500mg)	Oral	To treat a wide variety of bacterial infections	Once daily	Diarrhoea, nausea, vomiting
31	Azimax 50	Cipla Ltd.	Azithromycin (500mg)	Oral	To treat a wide variety of bacterial infections	Once daily	Diarrhoea, nausea, vomiting
32	Azibact 500	Ipca laboratories Ltd.	Azithromycin (500mg)	Oral	To treat a wide variety of bacterial infections	Once daily	Diarrhoea, nausea, vomiting
33	Zithium 500	Alkem Laboratories Ltd.	Azithromycin (500mg)	Oral	To treat a wide variety of bacterial infections	Once daily	Diarrhoea, nausea, vomiting
34	Mox 500	Sun Pharmaceutical Industries Ltd.	Amoxicillin (500mg)	Oral	To treat a wide variety of bacterial infections	Twice daily, thrice in a day	Rash, vomiting, stomach pain
35	Wymox 500	Pfizer	Amoxicillin (500mg)	Oral	To treat a wide variety of bacterial infections	Twice daily, thrice in a day	Rash, vomiting, stomach pain

DISCUSSION

This survey was mainly performed to record different ADRs of antidiabetics, antianginals and antibiotics which are available in the Government hospital or in the private hospitals in West Bengal.

In this survey the healthcare staffs in the hospital were interviewed about different aspects of the drugs that are administered to the patients. The different aspects being drug name either brand name or generic name, their manufacturers, how much dose is given to the patients, drug's route of administration, their uses, their frequency of administration and the drug's side effects. This information was recorded in the given table:

In accordance with the hospital administration with the medical ethics (taken in consideration) the personal information or any other information like the name, sex, age, height, weight etc. about the patient were kept confidential in this survey.

ADRs were recorded by interviewing the healthcare professionals of the hospital whenever possible but no contact with the patients was made.

At that time when the survey was conducted there were 8 antidiabetics, 7 antianginals and 10 types of antibiotics given to the patients in NRS Medical College and Hospital. The same time admitted patients in RSV Hospital were given 7 antidiabetics, 11 antianginals and 10 types of antibiotics. On the other hand VIP APEX Medical Centre was giving patients 24 antidiabetics, 14 antianginals and 35 types of antibiotics respectively including same class of drugs with different manufacturers.

Patients who were being treated with Antidiabetic drugs reported rapid weight gain with nausea, vomiting and with a minor number of patients complains about hypoglycemia or low blood sugar level. There are also some other non-serious side effects like loss of appetite, weakness and headache were found in the patients.

Patients who were being administered antianginals showed symptoms of dizziness, fatigue, headache, and nausea. Some minor cases of serious ADRs like heavy breathing or low blood pressure were also observed in the patients.

Antibiotics were being used in a variety of diseases thus they also produce different kinds of ADRs. People

after administering antibiotics reported cases of headache, nausea, vomiting, constipation, itching, skin rash and other allergic reactions, indigestion, stomach upset, stomach pain, abdominal pain. Some serious cases of diarrhea were also seen. The observed side effects in the survey were near about the same on every hospital with a minor number of the data may be different.

CONCLUSION

The main purpose of this survey was to record different ADRs of antidiabetics, antianginals and antibiotics. Every class of drug has its own unique actions and unique side effects. If the drug in question has been properly profiled or monitored then the potential risks associated with the side effect of the drug can be kept at minimal or the serious life-threatening effects may be minimized. In case of antidiabetics rapid weight gain, nausea, vomiting is seen with some other minor side effects. Antianginals produce fatigue, dizziness, and headache. On the other hand antibiotics produce a range of side effects like constipation, diarrhea, nausea, vomiting etc. Monitoring these kinds of ADRs and maintaining this information is very important for the rational treatment of the patient. If pre examined information is available then the treatment will be quick, safe and responsive with minimal risk incidents.

REFERENCES

1. Chowta MN, Kamath P, Ramapuram JT, Shenoy KA, Hadigal S. Evaluation of Adverse Drug Reaction Profile of Drugs Used as First-Line Antiretroviral Therapy. *Interdiscip Perspect Infect Dis*. 2018;(8095609):1–8. Available from: <https://doi.org/10.1155/2018/8095609>.
2. Tripathi K. *Essentials of Medical Pharmacology*. 8th ed. New Delhi. Jaypee Brothers Medical Publishers (P) Ltd. 2019.
3. Laight D. The pharmacology of oral antidiabetic agents. *Nurse Prescribing*. 2014;12(12):604–607.
4. Whalen K, Finkel R, Pharmacology PT. *Pharmacology*. 6th ed.. 2015.
5. Tripathi K. *Essentials of Medical Pharmacology*. 8th ed. New Delhi. Jaypee Brothers Medical Publishers (P) Ltd. 2019.
6. Prasad J. *Textbook of Pharmacology*. 2nd ed. Universities Press. 2019.
7. Whalen K, Finke R, T TP. *Pharmacology*. 6th ed. Philadelphia. 2015.
8. Prasad J. *Textbook of Pharmacology*. 2nd ed. Universities Press. 2019.
9. Topics H. Antibiotics. 2022. Available from: <https://medlineplus.gov/antibiotics.html#:~:text=Antibiotics%20are%20medicines%20that%20fight>.
10. Antibiotics: Uses, resistance, and side effects. 2022. Available from: <https://www.medicalnewstoday.com/articles/10278>.