



INQUISITIVE

CANAGLIFLOZIN AND DAPAGLIFLOZIN SODIUM GLUCOSE COTRANSPORTER-2 (SGLT2) INHIBITORS TO TREAT TYPE 2 DIABETES MELLITUS

AJAY KUMAR SARABU,A.ROSHINI REDDY,MOHD.TAHIR SIDDIQUI PHARM-D 5TH YR.

Inside this issue:

REVIEW ON
CANAGLIFLOZIN
and
DAPAGLIFLOZIN

1

Currently US FDA has approved two drugs under this class (Canagliflozin and Dapagliflozin) and drugs like Ipragliflozin, Tofogliflozin, Empagliflozin, and Remogliflozine carbonate are under clinical trail.

APPLICATION OF
PHARMACOECONOMIC
ANALYSIS AS A
TOOL TO TREAT
DIABETIC FOOT

3

The kidney plays a contributing role in maintaining normal glucose balance, in part by filtering and subsequently reabsorbing glucose back into circulation. SGLT2, a sodium-glucose cotransporter found predominantly in the kidney, is responsible for the majority of glucose reabsorption. Selective inhibition of SGLT2 reduces the reabsorption of glucose and enables its removal via the urine, which is associated with reductions in HbA1c, weight and systolic blood pressure.

EVENTS ORGANISED BY
DEPT OF
PHARMACY PRACTICE

7

LIST OF EVENTS
ORGANISED AT
MRCP

8

UPCOMING EVENTS

9

Canagliflozin: It is an adjunct to diet and exercise to improve glycemic control in adults with type II DM. Not recommended for patients with type I DM and diabetic ketoacidosis.

Dosage: 100mg Once daily.

Side Effects: Hypotension, impaired renal function, Hyperkalemia, Hypoglycemia, with concomitant use with insulin and insulin secretagogues, Genital Mycotic Infections, hypersensitivity reactions, increased low density lipoprotein levels, UTI, Nausea, Constipation, Thirst.

Farxiga (Dapagliflozin)

The drug's safety and effectiveness were evaluated in 16 clinical trials involving more than 9,400 patients with type 2 diabetes. The trials showed improvement in HbA1c (hemoglobin A1c or glycosylated hemoglobin, a measure of blood sugar control).



The FDA is requiring six post-marketing studies for Dapagliflozin:

A cardiovascular outcomes trial (CVOT) to evaluate the cardiovascular risk of Dapagliflozin in patients with high baseline risk of cardiovascular disease;

A double-blind, randomized, controlled assessment of bladder cancer risk in patients enrolled in the CVOT;

An animal study evaluating the role of Dapagliflozin-induced urinary flow/rate and composition changes on bladder tumor promotion in rodents;

Two clinical trials to assess the pharmacokinetics, efficacy, and safety in pediatric patients; and

An enhanced pharmacovigilance program to monitor reports of liver abnormalities and pregnancy outcomes.

In clinical trials the most common side effects observed in patients treated with Dapagliflozin were genital mycotic (fungal) infections and urinary tract infections.

impairment, end stage renal disease, or patients on dialysis.

An increased number of bladder cancers were diagnosed among Dapagliflozin users in clinical trials so it is not recommended for patients with active bladder cancer. Patients with a history of bladder cancer should talk to their physician before using Dapagliflozin. Dapagliflozin can cause dehydration, leading to a drop in blood pressure (hypotension) that can result in dizziness and/or fainting and a decline in renal function. The elderly, patients with impaired renal function, and patients on diuretics to treat other conditions appeared to be more susceptible to this risk.

Dosage: 5mg once daily

Monitoring Parameters:

DAPAGLIFLOZIN causes intravascular volume contraction. Symptomatic hypotension can occur after initiating the drug particularly in patients with impaired renal function (eGFR less than 60 mL/min/1.73 m²), elderly patients, or patients on loop diuretics. Before initiating the drug in patients with one or more of these characteristics, volume status should be assessed and corrected. Monitor for signs and symptoms of hypotension after initiating therapy. DAPAGLIFLOZIN increases serum creatinine and decreases eGFR. Elderly patients and patients with impaired renal function may be more susceptible to these changes. Adverse reactions related to renal function can occur after initiating DAPAGLIFLOZIN. Renal function should be evaluated prior to initiation of this drug and monitored periodically thereafter.

Side effects: Hypotension, impaired renal function, Hyperkalemia, Hypoglycemia, with concomitant use with insulin and insulin secretagogues, bladder cancer, back pain, UTI, Nausea, constipation, nasopharyngitis.

Contraindications: History of hypersensitivity towards dapagliflozin, severe renal impairment, end stage renal disorders, or patients on dialysis.



MALLAREDDY COLLEGE OF PHARMACY,
AFFILIATED TO OSMANIA UNIVERSITY, ACCREDITED BY NBA
APPROVED BY AICTE, PCI
VISIT OUR WEBSITE @ www.mrcp.ac.in

Brief History Of Pharmacoeconomics

In the year 1977 Application of economics for Pharmacy services began.
 In 1983, Graduate Program for cost effectiveness and cost benefit analysis was introduced.
 In 1986 first time pharmacoeconomics appeared in literature focusing on products.
 In 1982 first journal was Published.
 In 1999 Drug Trend Report showed an increase in the double digits in pharmaceutical expenses 1995-1999.
 Now, this field has been adopted world wide as a part of Health Science.

APPLICATION OF PHARMACOECONOMIC ANALYSIS AS A TOOL TO TREAT DIABETIC FOOT INFECTIONS
AJAY KUMAR SARABU, M.SUDHAKAR, B.V.S.LAKSHMI.*

ABSTRACT:

Diabetes mellitus (DM) is one of the most prevalent diseases in world with 382 Million People with DM .India with 65.1 million DM is second country among the world .80% of people with diabetes live in **low- and middle-income countries**. In this article application of pharmacoeconomic analysis and its importance for treating diabetic foot infection will be discussed.The patients with diabetes mellitus will have the complications like foot infections. Research done by American diabetic association (ADA) reported that 15% of people with diabetes will experience a foot ulcer at some point in their lifetime, recent research suggests this figure may be as high as 25% People with diabetes are 25 times more likely to lose a leg than people without the condition . Cost minimization analysis are one of the best tools for minimizing the cost of the therapy since People in lower socioeconomic groups tend to be at increased risk for diabetic foot disorders Diabetic foot infections are treated with antibiotics, so selection of antibiotic should be done based on culture sensitivity test and after administration of the antibiotic the effect of antibiotic should be measured by inoculating the wound swab culture into growth medium and observed for reduction in growth of bacteria. In cost minimization analysis one can observe the difference in the cost of two equivalent antibiotics and their price variations should be compared.

KEY WORDS: Diabetes mellitus, Antibiotic, Pharmacoeconomics, cost effective analysis, Cost minimization analysis.

Introduction:

Pharmacoeconomics can be defined as the field of study that evaluates the behavior of individuals, firms, and markets relevant to the use of pharmaceutical products, services, and programs and

PHARMACOECONOMICS IS ONE OF THE BEST TOOL IN FORMULARY DECISION MAKING.

Method	Cost	Measure-ment	Outcome Measurement	Decision Rule
Cost Minimization Analysis	Monetary		Outcomes of Alternatives assumed identical	Lowest monetary cost
Cost Benefit Analysis	Monetary		All outcomes translated into monetary units	Net monetary gain
Cost Effective (CE)Analysis	Effective Monetary		Non monetary physical units of effectiveness	CE ratios using incremental of marginal analysis
Cost Utility Analysis	Monetary		Utility values and quality adjusted life years (QALY)	Cost per QALY and league tables
Cost Outcome Analysis	Monetary		Combination of quality of life and natural units	Choice left to the decision makers

Types of Pharmacoeconomic Evaluation.
Cost Minimization Analysis (CMA)
Cost Benefit Analysis (CBA)
Cost Effective Analysis (CEA)
Cost Utility Analysis (CUA)

COST MINIMISATION ANALYSIS(CMA): It is a tool used in pharmacoeconomic analysis and applied when comparing multiple drugs of equal efficacy and equal tolerability.

Indication of CMA:

To compare medications examples:

The same chemical entity, the same dose, and have same pharmaceutical properties as each other

Brand Vs Generic or Generic made by one company compared with a generic made by another company,

CMA is simplest of four types pharmaco-economics analysis (because the focus is on measuring the costs and outcomes)

Here an example of CMA for treatment of diabetic foot infection with Linezolid infusion for initial two days followed by 21 days with tablet linezolid twice daily was discussed by taking various brands of linezolid with their total treatment cost was compared.

VARIOUS LINEZOLID BRANDS (INFUSION)	MANUFACTURER	PRICE PER INFUSION INR (300ML) (2mg/ml)	TOTAL COST FOR COMPLETE TREATMENT OF DIABETIC FOOT INFECTIONS(2DAYS) REQUIRES 4 UNITS
LIZOFORCE	MICRO LABS PVT.LTD	199	796
LINOSEPT	CORONA REMEDIES	258	1032
XOLID	ALEMBIC CHEMICAL WORKS	258	1032
ALZOLID	BIOCON LIMITED	270	1080
ENTAVAR	SHREYA LIFESCIENCES PVT.LTD	290	1160
LINTRAN	UNICHEM LABS LTD	322	1288
LINOX	NOVATIS INDIA	329	1316
WALIBUR	CIPLA	330	1320
LINOSPAN	RSMKILITCH PHARMA PVT LTD	350	1400
TREZELET	ZYDUS CADILLA HEALTH CARE	370	1480
LINID	RELIEF FORMULATIONS	370	1480
ADLID	GLENMARK PHARMACEUTICAL LTD	379	1516
LIZOLID	UNICHEM LAB LTD	382	1528

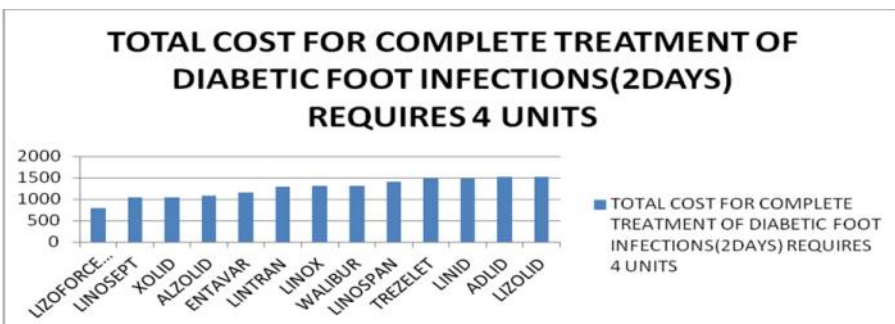
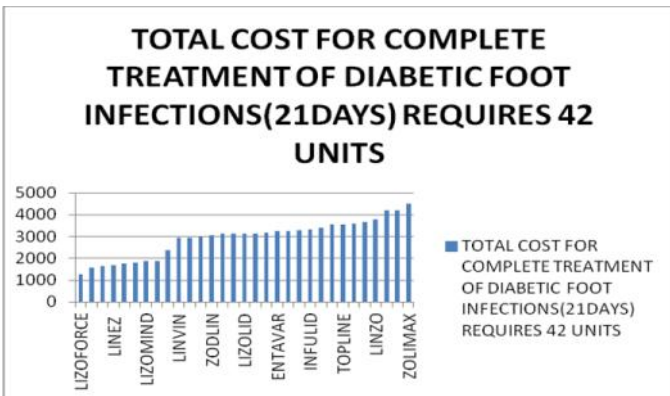


Table 2: various brands of Linezolid manufacturers and price for each unit and total treatment cost

X- AXIS DIFFERENT BRANDS OF LINEZOLID INFUSION; Y-AXIS Total treatment cost (INR)

VARIOUS LINEZOLID BRANDS (600MG) TABLETS	MANUFACTURER	PRICE PER EACH TABLET(INR)	TOTAL COST FOR COMPLETE TREATMENT OF DIABETIC FOOT INFECTIONS(21DAYS) REQUIRES 42 UNITS
LIZOFORCE	Race Pharmaceuticals	29.90	1255.8
RALINZ	Zydus cadilla health care	37.80	1587.6
LINID	zaneka Pharmaceuticals	39	1638
LINEZ	Macleoids pharmaceuticals	40	1680
LIZOMAC	Corona Remedies	41.98	1763.16
XOLID	All minds labs pvt ltd	43	1806
LIZOMIND	Plenus Pharmaceuticals	45	1890
LIZOLAN	Research medicure	45	1890
MOLZODIN	Slaney Healthcare	56.4	2368.8
LINVIN	FC Remedies	70	2940
FLYZID	Aglow med Pvt ltd	70	2940
LIZOMED	FDC Limited	71.04	2983.68
ZODLIN	Alembic chemical works	72.5	3045
ALZOLID	Molekule pvt ltd	74.5	3129
LIZEMOX	Integrace	74.75	3139
LIZOLID	Chemobiological	74.75	3139
LIZOSTAR	Novartis India ltd	75	3150
WALIBER	Biocon Ltd	75.63	3176.46
ENTAVAR	Cipla ltd	77.25	3244.5
LINOSPAN	Shreya lifesciences ltd	77.78	3266.76
LINTRAN	Neiss labs pvt ltd	77.87	3270.54
INFULID	Qualitron Pvt Ltd	78.75	3307.5
MULTILID	Cure quick remedies	80.75	3391.5
LIMET	Solitare Pharma ltd	85	3570
TOPLINE	Unihem laboratories ltd	85	3570
LINOX	Canon Biotech	85.3	3582.6
ZOLIDINE	Health biotech pvt ltd	87.5	3675
LINZO	Micro labs pvt ltd	90	3780
LINOSEPT	Abott healthcare pvt ltd	100	4200
LIZBID	Biomax biotechnologies	100	4200
ZOLIMAX	Aglow Med	107.5	4515



Conclusion: The total treatment cost of TAB. Lizoforce 600 mg (linezolid) tablet is 1256 (inr) where the treatment cost of and Tab. Zolimax 600mg is 4515 (inr) where there is 2.6 folds difference was observed and in similar manner the total treatment cost difference between Inj.lizoforce infusion and Inj.lizolid infusion there was 1.9 folds difference was observed, Hence cost minimization analysis was one of the best tool in Hospital formulary decision making and it will reduce treatment burden to the patient.

SHORT COMMUNICATION

Joint National Committee Guidelines(JNC) 8 Guidelines :Important changes from the JNC 7 guidelines R.Ramya , J.Manasa Pharm-D 5th yr.

- In patients 60 years or older who do not have diabetes or chronic kidney disease, the goal blood pressure level is now <150/90 mm Hg
- In patients 18 to 59 years of age without major comorbidities, and in patients 60 years or older who have diabetes, chronic kidney disease (CKD), or both conditions, the new goal blood pressure level is <140/90 mm Hg.
- First-line and later-line treatments should now be limited to 4 classes of medications: thiazide-type diuretics, calcium channel blockers (CCBs), ACE inhibitors, and ARBs.
- Second- and third-line alternatives included higher doses or combinations of ACE inhibitors, ARBs, thiazide-type diuretics, and CCBs. Several medications are now designated as later-line alternatives, including the following: beta-blockers, alfablockers, alpha1/beta-blockers (eg, carvedilo), vasodilating beta-blockers (eg, nebivolol), central alpha2/-adrenergic agonists (eg, clonidine), direct vasodilators (eg, hydralazine), loop diuretics (eg, furosemide), aldosterone antagonists (eg, spironolactone), and peripherally acting adrenergic antagonists (eg, reserpine).
- When initiating therapy, patients of African descent without CKD should use CCBs and thiazides instead of ACE inhibitors.
- Use of ACE inhibitors and ARBs is recommended in all patients with CKD regardless of ethnic background, either as first-line therapy or in addition to first-line therapy.
- ACE inhibitors and ARBs should not be used in the same patient simultaneously.
- CCBs and thiazide-type diuretics should be used instead of ACE inhibitors and ARBs in patients over the age of 75 years with impaired kidney function due to the risk of hyperkalemia, increased creatinine, and further renal impairment

<http://www.ajmc.com/publications/evidence-based-diabetes-management/2014/jan-feb2014/The-JNC-8-Hypertension-Guidelines-An-In-Depth-Guide>

Traditional day 2014 celebrations.

Malla reddy college of pharmacy celebrates traditional day every year. It includes extra curricular activities like ranjoli singing dancing and games(indoor and outdoor). Students of B.Pharm, Pharm. D and M.Pharm students celebrate the day in a grand manner.



**MALLA REDDY COLLEGE OF PHARMACY,
AFFILIATED TO OSMANIA UNIVERSITY ,ACCREDITED BY NBA
APPROVED BY AICTE,PCI
VISIT OUR WEBSITE@ www.mrcp.ac.in**

Pharm. D 5th year students(2009-15 batch) are conducting health camp

Our Pharm. D 5th year students have taken initiative to conduct medical camp and educate primary and secondary school children with healthy habits.

Date : 14-03-2014

Venue : Zilla parishad school, Suraram.

Total no. of students in school: 594 (primary -234 and secondary - 360).

Total no. of staff -18.



International seminar on 28-Jan-14.

Malla Reddy college of Pharmacy conducted international seminar on 28-Jan-2014. The college invited guests speakers from Athlone Institute of Technology, Ireland. Dr. Andrew Fogarty, PhD, Senior Lecturer Athlone Institute of Technology, Ireland delivered a lecture on "In-vivo Toxicity Testing of Environmental Chemicals" and Dr. Don Faller, PhD, HOD of Life & Physical sciences, Athlone Institute of Technology, Ireland delivered a lecture on "Regulation of Intracellular Calcium & the Role of Calcium in Neurotoxicity." Two hundred Pharm. D students attended



UPCOMING EVENT:-



MALLA REDDY COLLEGE OF PHARMACY
AFFILIATED TO OSMANIA UNIVERSITY
ACCREDITED BY NBA
APPROVED BY AICTE; PCI
INVITES YOU TO

“PHARMACY PRACTICE SCIENTIFIC CONFERENCE” ON 2nd and 3rd May ,2K14

THEME:- ROLE OF PHARM.D GRADUATES IN GLOBAL HEALTH CARE SCENARIO

MALLA REDDY COLLEGE OF PHARMACY
MAISAMMAGUDA, POST VIA HAKIMPET, SECUNDERABAD-500014

PRIZES:
ORAL/POSTER PRESENTATION

REGISTRATION FEE: ₹500/-
SPOT REGISTRATION: ₹600/-

INVITES YOU TO
PHARMACY PRACTICE SCIENTIFIC CONFERENCE
THEME : ROLE OF PHARM.D GRADUATES IN GLOBAL HEALTH CARE SCENARIO
2nd AND 3rd MAY 2K14
GUEST LECTURES BY EMINENT SPEAKERS

AREAS OF FOCUS :
POSTER PRESENTATION
 ☆ PHARMACOVIGILANCE
 ☆ PHARMACOTHERAPEUTICS
 ☆ CLINICAL RESEARCH
 ☆ EVIDENCE BASED MEDICINE
 ☆ CLINICAL PHARMACY
ORAL PRESENTATION
 ☆ PHARMACOTHERAPEUTICS
 ☆ PHARMACOEPIDEMIOLOGY & PHARMACOECONOMICS
 ☆ EVIDENCE BASED MEDICINE

EVENTS
 ☆ ORAL PRESENTATIONS
 ☆ POSTER PRESENTATIONS

REGISTRATION SYSTEM
 LAST DATE FOR ABSTRACT SUBMISSION: 29 APRIL 2014
 LAST DATE FOR REGISTRATION: 30 APRIL 2014

Interested candidates are requested to mail their abstracts at mrcpconference@gmail.com

CHIEF PATRON C.R.MALLA REDDY, CHAIRMAN, MRCP	CONVENER Dr. SUDHAKAR, Professor & Principal MALLA REDDY COLLEGE OF PHARMACY	CO-CONVENERS Dr. N. SHENIVAR, Principal, MRCP Dr. PRASA REDDY, Principal, MRCP SCIENTIFIC COMMITTEE Dr. V. LAKSHMI Vice-Principal (9986024004) Dr. VINAY UMESH RAO M.Pharm., Ph.D. (7708355661) Mrs. RICHA SRIVASTAVA M.Pharm. (9981221031)	REGISTRATION COMMITTEE Dr. AJAY KUNAR BARAD (Pharm.D, B.Ph., D. (060203000)) Mr. PRASAD ANJAY (U.D. M.Pharm. (9913875883)) Mr. CH. SOWMYA M.Pharm. (9441808861)
EXTRAS Dr. MAHENDER REDDY, SECRETARY MRCP Dr. BHADRA DEDDY, TREASURER MRCP	CO-PATRONS Col. G. BABU REDDY Director, ADMINISTRATION, MRCP Prof. L. MAHAN MOHAN Director, ACADEMICS, MRCP	STUDENT COORDINATORS MOHIT TATHI (9965944020) ANVA ANTHEER (98996148799) PRAM (9863847318) A. BHISHMI REDDY (9903102963) S. RAMYA (9979691192)	

MALLA REDDY COLLEGE OF PHARMACY **MALLA REDDY HOSPITAL**

THE INQUISITIVE ADVISORY BOARD

Dr.M.Sudhakar
M.Pharm,Ph.D
Principal ,MRCP

Dr.S.Ajay Kumar
Pharm.D PB (Ph.D)
Assistant Professor

G.Prathibha
M.Pharm Pharmacy Practice
Assistant Professor

Dr.B. V.S.Lakshmi
M.Pharm,Ph.D
Vice Principal
Professor & HOD

Mr.P.Ramanjaneyulu
M.Pharm,Pharmacy practice (Ph.D)
Assistant Professor

P.Alekhyia
M.Pharm Pharmacy Practice
Assistant Professor

Dr.Vinay Umesh Rao
M.Pharm Ph.D
Professor

Ms.CH.Sowmya
M.Pharmacy Practice
Assistant Professor

Mrs.Richa Srivastava
M.Pharm,Pharmacy Practice
Assistant Professor



Malla Reddy College of Pharmacy



MALLA REDDY HOSPITAL



Drug Information Center

ROOM NO:- 304
MALLA REDDY HOSPITAL