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Review Article

An Article on Glimeperide: An Oral Hypoglycaemic Drug

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ABSTRACT:

Glimepiride is a second generation sulfonylurea of oral hypoglycaemic drug that stimulates the ß-cells of the pancreases to secrete insulin. In this article there is full information on all the research work and development done on glimepiride drug. The main motive is to compile all the works which have done.

Introduction:-

Glimepiride is a sulfonyl urea used to treat type –II diabetes mellitus. Molecular formula of glimepiride is C_{24} H_{34} N_4 O_5S with a molecular mass of about 490.617g/mol [1] . It belongs to class-II of Biopharmaceutical classification system. It is completely insoluble in water, acidic media and slightly soluble in various buffers and organic solvents [2] . It is administered orally; insoluble in water, slightly soluble in methylene chloride(Dichloromethane), very slightly soluble in methanol and soluble in Dimethyl Sulfoxide (DMSO) [1, 3] . Glimepirideshows low pH dependent solubility. Inacidic and neutral aqueous media, glimepiride exhibits very poorsolubility at 37 0 C (<0.004 mg/ml). In media pH>7, solubility

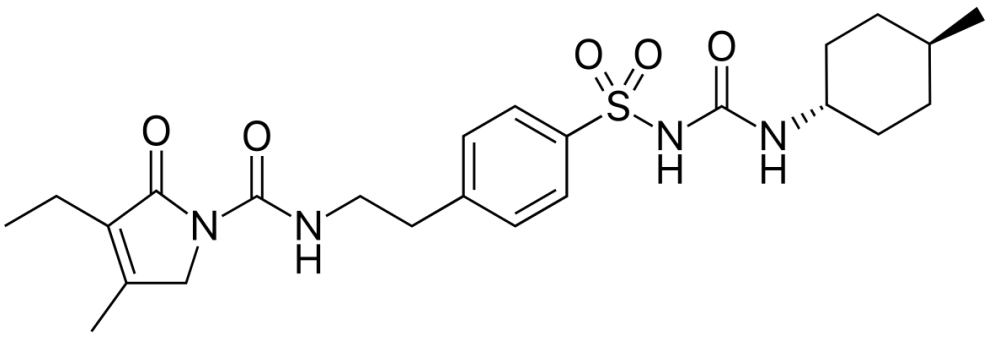


Fig 1:-Structure of Glimepiride

of drug isslightly increased to 0.02 mg/ml. Thesepoorlywater soluble drugsprovide challenges to deliver them in an active and absorbable form tothe desired absorption site using physiologically safe excipients [4-6] .This poor solubility may cause poor dissolution an unpredicted bioavailability. It is practically insoluble in water and other aqueous media. However, the drawback of this potentially useful hypoglycemic agent is that it is highly hydrophobic and practically insoluble in water.

Mechanism of action:-

The primary mechanism of action of glimepiride for lowering blood glucose levels seems to be dependent on stimulating the release of insulin from the functioning pancreatic cells. Glimepiride acts by binding to ATP sensitive potassium channel receptors on the

pancreatic cell surface, which reduces potassium conductance causing membrane depolarization. Calcium ion reflux is promoted by membrane degradation through voltage-critical calcium channels. This increase in intracellular calcium ionconcentration causes insulin production. It can be used simultaneously with metformin, thiazolidinedione, insulin and alpha-glucosidase inhibitors treatment for type 2 diabetes (insulin-dependent). It is completely absorbedinto the intestinal tract when we are treated orally. Possible side effects of severe hypoglycemic reaction with coma, epilepsy, or other sensory impairment. Other reported side effects of sulfonylureas include clolestaticjaundice, nausea and vomiting, aplastic and hemolytic anemia, agranulocytosis, general hypersensitivity reactions, and rash [1,9].

Extra-pancreatic action: -

After chronic administration, the insulinemic action of sulfonylureas decreases approximately due to a decrease in control. Sulfonylurea receptors in ß-cells, but improvements in glucose tolerance are maintained.At this stage, they are sensitive targeted tissues (especially the liver) in theaction of insulin. This is due to an increase in the number of insulin receptors and / or or postreceptoraction-improving translation of receptor activation. It is thought that long-term development in Carbohydrate tolerance leads to a decrease in insulin resistance in the blood, which in turn leads to a decrease in insulin control insulinreceptors - a significant increase in their number. The direct extra-pancreatic activity of sulfonylureas increases It has been suggested that insulin receptors in targeted cells also inhibit gluconeogenesis in the liver, but appear to be lesseffective. clinical significance [10].

Activities performed on glimeperide: -

There are several functions performed by the drug glimepiride. Thefollowing are the functions of the drug glimeperide:

- Gliepiride (GMP) has been identified as a model drug for studies to improve current eradication. investigation. Efforts have been made to improve GMP dispersion using a solid dispersion method (SD). GMP SDP-PXM 188 (Poloxamer 188) SDs are processed in different proportions using a melting method, and then SD fine-grained tablets built using direct pressure method. SDs tested XRD, SEM, In-vitrodissolution profiles, and efficient completion, and enhanced tablet design tested for different aspects of medicine namely. hardness,% firmness, weight loss, drug content, dispersion time, In-vitrodissolution profiles, and efficiency of completion Between various formulas SD, SD containing the drug in the polymer ratio 1: 4 provides the best dispersion profile and efficiency of dispersion once during tablet formation, the composition containing 5% croscarmellose sodium provides the best dispersion and completion profiles compared to other forms. The results showed that poloxamer is a promising polymer to improve the melting of GMP [11].
- Gliepride Solid dispersion (SD) is prepared by dissolving the drug and polyvinyl pyrrolidine K30 Dichloromethane and solvent are removed with

a rotating evaporator under reduced pressure. Solubility increased by about twenty times when the drug and the carrier using a ratio of 1:10. Oro tablets dispersed were prepared using Sodium starch glycolate, cross caramellose sodium, pre-gelatinized starch and polacrilin. potassium as super disintegrants. Rapid dispersion (24 sec) is found in polacrilinpotassium (10%) once high drug release (85.6%) achieved in 10 min. From these results it concludes that the melting of glimepride increases with strong dispersion and rapid bioavailability is detected by preparation orodispersible pills [2].

- Gliepiride SDs with PEG 20000 fixed in ratios of 1: 1, 1: 3 and 1: 5 (Glimipiride: PEG 20000) by way of melting. The main purpose of the current study was to investigate physicochemical Features of glimepiride on SDs with PEG 20000. Possible interaction between glimepiride and PEG 20000 in both solid states and liquid states were investigated.Cooperation in the strong case was investigated by FTIR and XRD. The solution in the solution was studied by the analysis of the melting phase and the completion phase. SDim 20000 glimepiride SDs showed improved glimepiride dissolution rate, as well as increased with increasing focus of PEG 20000 on SDs. Medium termination (MDT) of glimepiride decreased significantly after SD adjustment and body mix with PEG 20000. FTIR spectroscopic Studies have shown glimepiride stability and a well-defined lack of interaction with glimepiride-PEG 20000. I XRD studies have shown amorphousstate glimepride with PEG 20000 [12].
- Gliepiride (GMP) has been identified as a model drug for studies to improve current eradication. investigation. Efforts have been made to improve GMP dispersion using the SD method. GMP SDPs with polyvinylpyrrolidone (PVP K 30) was prepared in different proportions using a solvent evaporation method and then the most efficient SD tablets were developed using a direct compression method. Tablet the structure was adjusted in the form of direct pressure using super-disintegrants; crospovidone separately to focus. SDs are tested for FTIR, XRD, SEM, In- vitrodissolution profiles, and advanced tablet. the composition was tested for different drug properties namely. hardness,% firmness, weight variability, drug content, dispersion time, In-vitrodissolution profiles [4].

Glimipiride (GMP) is a water-soluble drug, so melting is a major barrier to oral discovery. The aim of the research project is to improve the melting of Glimepiride through solid dispersion technology. The polymers used were Poloxamer 188 and Poloxamer 407 and the solid dispersions were repaired by. how to mix. Solubility studies were performed to study the effect of polymers on the melting of Glimepiride. Fixed solid dispersion noted by In-vitro solubility Study,% drug content; Fourier alters spectroscopy (FTIR), in-vitro drug depletion to detect physicochemical interactions between drugs and auxiliary. Solid dispersion studies were performed using USP II tools. The solid dispersion prepared by the Poloxamer 188 showed a better drug release compared to solid dispersed prepared with Poloxamer 407 [7]. The purpose of this study was to improve solubility, rate of dissolution and continuous release of the drug. Gliepiride cubosomes are prepared in a high-grade form using Glycerylmonooleate (GMO) as a lipid. class car, Poloxamer 407 as a stabilizer and clear water as a water phase. Cubosome effect dispersion is characterized by efficient encapsulation, In-vitro drug release, particle size, zeta strength,FTIR and SEM. Prepared formulation (F5) showed a maximum drug release of 71% in 6 hours, particle size. of 88.7nm and zeta power of 43.6 mV. Glimepiride cubosomal Capsules were optimized The cubosomal dispersion, using a new method of starch and aerosil were used as granulating agents to obtain a lot of wet. The wet residue is then transferred through a sieve no. 16 to form granules. Then the granules aredried in the middle Hot oven. Dried granules are filled with capsules.

Granules tested for SEM, zeta strength, flow properties and release of In- vitro drugs. The structure of the prepared capsule (C2) contains the starch shown a 49% drug release in 6 hours, particle size of 213nm and zeta power of -159 mV. In-vitro the release of kinetics has been shown to continue for up to 6 hours and is followed by a non-Fickian distribution. The results are encouraging that GMO cubosomes, such as lipid nanovectors, can significantly improve oral performance Gliepiride powder [13]. The main objective of the study was to increase the number of molecules of soluble drugs in the absorption zone by increasing the rate of elimination, as in phase II drugs such as glimepiride, the rate of In-vivo elimination rate is moderate a step that reduces drug absorption. Surface solid dispersion (SSD) was chosen as an option from then on it can be easy on subsequent formulation and pill processing. The carriers used were crospovidone, croscarmellose, sodium glycolate starch, pre-gelatinized starch, Avicel PH 101 and potato starch. SSDs were prepared at various concentrations of the drug and carrier weight in the form of solvent solvent. The upgraded SSD was tablets are symptomatic and structured [14]. The novel system of the transdermal controlled matrix of the anti- diabetic drug glimepiride was developed using the environment polymer chitosan for extended and controlled drug delivery. Character entry by physicochemical studies. System improvement was done using In-vitrodrug permeation studies using mouse skin. Skin irritation tests andpharmacokinetic tests were performed on healthy mice. Blood glucose reducing the hypoglycemic function of the systems studied in diabetic mice [15].

Glimepiride is an oral hypoglycemic agent and is completely absorbed after oral administration but under liver metabolism that affects its function through single oral administration. Extending the For patient compliance and easy to administer, Grimepiride nasal gel was prepared using mucoadhesive polymers may extend their shelf life with subsequentbioavailability. It cries building with a controlled action of the drug is another good option. Challenges in nasal development construction includes low duration. Mucociliary clearance can be overcome by mucoadhesive formation composition [16].

The main purpose of this current research project is to obtain continuous Gliepiride release and development intestinal stay, for this purpose mucoadhesive microbeads are formed by hire. Ionic gelation method with HPMC and Na-CMC as adhesive polymers. Microbeads made of mucoadhesive properly tested for distribution size, congestion reliable entrapment efficiency, wall thickness, drug release courses, SEM durationand GI. In the current influence of polymer research on the rate of drug release and Coating of polymer coat with drug release rate in Gliepiride mucoadhesive microbeads he learned. The rate of drug release has been found to decrease by increasing the concentration of the coating polymer [17]. The aim of this study was to develop continuous glimepiriderelease pills in the form of wet granulation. based on a combination of hydrophilic (HPMC15cps, HPC) and hydrophobic polymers (Ethyl cellulose). I drug-assisted compounds were included in previous synthetic studies. Pills were placed underneath physicochemical studies, In-vitro drug release, kinetic studies and stability studies [18]. Glimepiride acts as an insulin secretagogue. Providing patients with the simplest mode of in management, there was a need to create a form of immediate releasedose, especially dispersed quickly and disperses and helps increase the Bioavailability of the drug. Immediate release of Gliepiride pills made using wet granulation method and povidone k30, starch as binding, croscarmellos sodium, sodium glycolate starch, crospovidone asdisintegrants, lactose monohydrate as diluent and magnesium stearate as a lubricant.Pills are tested for pre- and post-congestion parameters thereafter. conducting preformulation studies. All parameters were within the pharmacopoeial and drug limits dispersal during time waslow and In-vitro termination studies showed that drug release was rapid [19].

The main goal of the study was to make dispersed pills more quickly depressing Glimepiride uses various super disintegrants such as crospovidone, croscarmellose sodium, sodium starch. glycolate and L- HPC in various concentrations [20]. The aim of the current study was to design an integrated tablet with a glimepiride core tablet immediate release to produce an immediate therapeutic effect, which was inserted into a metformin cup hydrochloride for continuous delivery of metformin hydrochloride. The inner part of the interior was designed using superdisintegrants for immediate release and part of the outer cup was designed as a matrix construction using polymers such as Hydroxypropyl methyl cellulose (HPMC) and Poly vinyl pyrolidine (PVP) to drug release [21]. The purpose of preparing a self-microemulsifying drug delivery system in this work is to improve solubility and the oral bioavailability of a water-soluble drug, Glimepiride. Self-micro emulsifying drug delivery system (SMEDDS) is an isotropic mixture of surfactant, co-surfactant anddrug-derived oils. In the water media, gastro intestinal motility emulsification occurs. Gliepiride was subjected to solubility studies various surfactants, co-surfactants and oils [22].

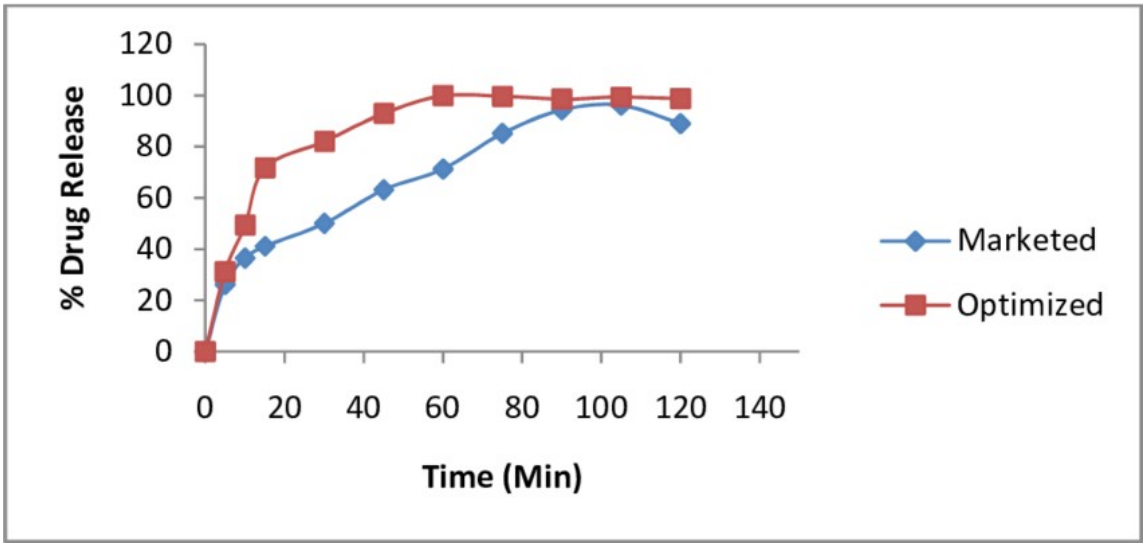
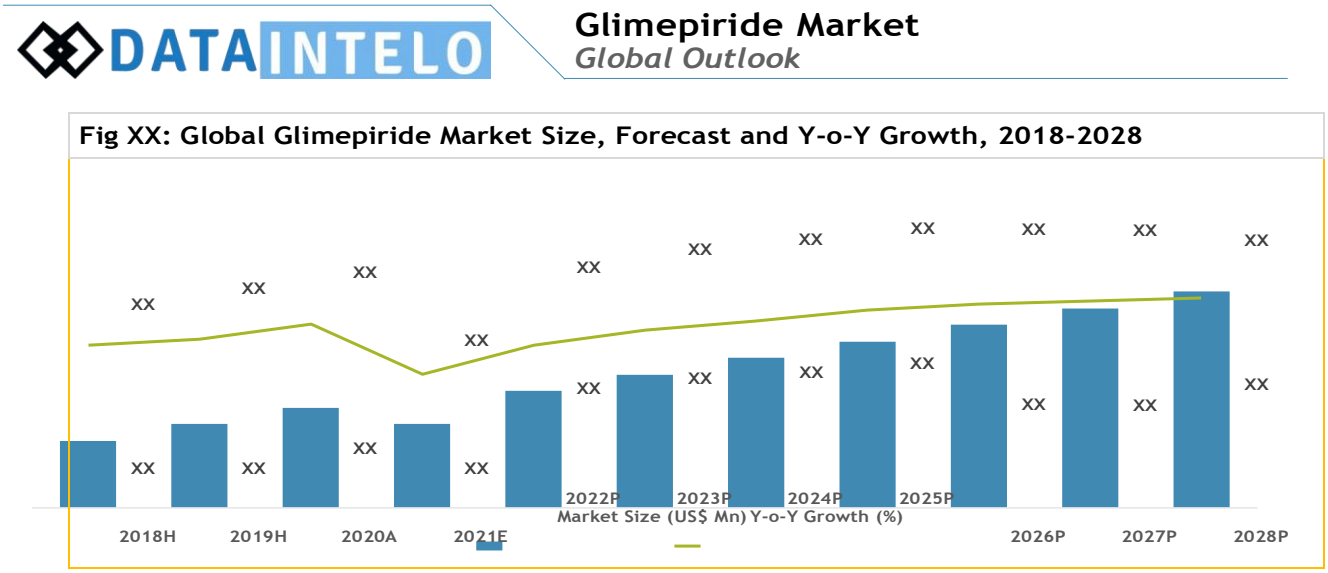


Fig: Dissolution profile of glimipiride



Conclusion:

The main purpose of writing this review was to gather all the relevant data on the glimeperide article. In this case Different types of glimepiride formulations are made given in a concise and concise manner better knowledge and strategies for the future.

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