**OBJECTIVE OF STUDY**

In recent years, significant efforts have been devoted to develop oral bilayer formulations as to overcome the compatibility problems by replacing an inert layer in between the two layers, and drugs having synergetic action can be formulated into bilayer tablets.

The main objective of present study is to develop dosage form which provides polytherapy for the treatment of NIDDM. Though there are numerous drugs for treating type II diabetes, sulphonyl urea and biguanide are used commonly by a wide section of patients

1. To develop a suitable combination of metformin and glimepiride bilayer tablet using different polymers.
2. Evaluation of bilayer tablets for physical and chemical parameters.
3. In vitro evaluation of bilayer tablets for the release characteristics.

In the present investigation, efforts were made to develop a bilayer tablet formulation of metformin hydrochloride and glimepiride for treatment of type II diabetes. The intended formulation was matrix tablet of metformin hydrochloride for extended release and glimepiride as conventional immediate release, which will provide similar in vitro release profile to that of commercial marketed products.

The choice of selection of glimepiride a sulphonyl urease drug and metformin hydrochloride a biguanide drug is based on their mechanism of action; in a synergetic manner they decrease glucose level in blood. Both these drugs will decrease the blood glucose level simultaneously by acting on pancreas and liver. Glimepiride will stimulate the pancreatic beta cells to release insulin whereas metformin hydrochloride will decrease the glucose level by inhibiting the glucose production in liver.

Glimepiride a high potent drug with 99% plasma protein binding, elimination half-life is 9-10 hours and its therapeutic concentration observed in blood is within 35-45 minutes where it shows its mechanism of action by stimulating beta cells of pancreas and selected for immediate layer. Metformin hydrochloride a hygroscopic drug with high rate of metabolism in liver and does not bind to plasma proteins has its effect on liver by inhibiting the glucose synthesis in a continuous way and selected for extended release layer.

Both the drugs are effectively used in the treatment of non-insulin dependent diabetes mellitus (NIDDM). On oral administration, metformin hydrochloride is absorbed
through GI tract and absolute bioavailability of metformin is approximately 50-60%. Metformin negligibly bounds to plasma proteins. It is excreted unchanged in the urine and does not undergo hepatic metabolism. It has a plasma elimination half-life of 3 hours. Its daily oral dose is 0.5 to 3 g/day in divided doses. Recommended dosage of conventional tablets is three times a day. Whereas glimepiride is also rapidly absorbed from the GI tract and its absolute bioavailability is approximately 40-55%. Glimepiride is having high plasma protein binding of 99%. It’s having plasma elimination half-life of 2-3hrs. Its daily dose is 1 to 4 mg in divided doses.

In the present market there are combinations of metformin and glimepiride tablets for the treatment of non-insulin dependent diabetes mellitus, these tablets are prepared by compressing the granules of both metformin and glimepiride. The drawback of this type of tablets is that the release kinetics of glimepiride which are not instant for rapid absorption into systemic circulation through gastrointestinal memraneto effect its action, which is against its pharmacokinetic properties.