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Development and Testing of Transdermal Patches Containing Inclusion Complexed Repaglinide and Cyclodextrin

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DESCRIPTION

Worldwide, chronic conditions like diabetes mellitus are very common. The goal of the study is to create a transdermal patch that may be applied to the skin to treat diabetes while minimising the number of pills required and improving patient compliance. Repaglinide was chosen as the active ingredient for creating a transdermal patch based on the favourable findings of a feasibility study, which included a doctor's opinion and prescription survey. Repaglinide and cyclodextrin were complexed using the grinding process. In the current investigation, several polymeric combinations, including Hydroxypropyl Methyl Cellulose (HPMC), Ethyl Cellulose (EC), and Eudragit L100 with Poly Vinyl Pyrolidone (PVP), were used to develop Matrix-type transdermal patch systems containing repaglinide-cyclodextrin complexes. The patches were subjected through physical-chemical tests, in vitro drug release experiments, and skin permeation tests [1].

All of the parameters that were analysed yielded positive results. Further research can be done before the created transdermal delivery system, which contains a compound of repaglinide and cyclodextrin, is available for sale. The injection of medications through the skin for both local therapeutic effects on sick skin (topical delivery) as well as for systemic drug delivery has sparked an increased interest in Transdermal Drug Delivery Systems (TDDS). The ability to avoid issues with gastric irritation, pH and emptying rate effects, avoid hepatic first-pass metabolism thereby increasing the bioavailability of drug, reduce the risk of systemic side effects by minimising plasma concentrations compared to oral therapy, and provide a sustained release of drug at the site of application are just a few of the important benefits of using the skin as a site of drug delivery over many other routes of drug administration [2].

Diabetes mellitus is a serious and spreading health issue that is a significant contributor to early death and chronic illness. It is a long-term metabolic condition defined by chronic insulin resistance and high blood glucose levels (hyperglycemia) brought on by insulin insufficiency.

Repaglinide is an oral meglitinide class medication that lowers blood sugar levels and is used to treat Non Insulin Dependent Diabetes Mellitus (NIDDM). It causes the pancreas to release more insulin, which decreases blood sugar. It has a 1 hour half-life, which is incredibly brief. Additionally, due to a significant hepatic first-pass impact, repaglinide has a low oral bioavailability (56%) rate. Repaglinide dosage ranges from 0.5 to 4 mg administered 3 to 4 times per day. The patient may benefit from repaglinide topical formulation because it lessens side effects and prevents hepatic first-pass metabolism. Repaglinide's transdermal administration is necessary for diabetic patients since stable plasma concentrations are needed for long-term successful blood sugar control in these individuals [3-4].

The goal of the current research was to create a transdermal repaglinide formulation that improves patient compliance and sustains drug release to boost bioavailability. The solvent casting approach was used to create transdermal patches of the Repaglinide drug-inclusion complex type. Di-butylphthalate was used as a plasticizer at a 20% weight-to-weight ratio in the dry weight of the polymers. Backing membrane was cast by adding 4% aqueous polyvinyl alcohol solution to a petridish containing glycerin, heating it to 60°C for six hours, and then letting it evaporate. The drug matrix was made by dissolving various polymers (PVP with HPMC, EC, or Eudragit L100) in a solvent containing dimethylformamide in various ratios with drug complexes. Using a magnetic stirrer, slow stirring was used to create the uniform dispersion. On the ready backing membrane, a prepared homogeneous dispersion with plasticizer is poured. A drug polymer matrix patch was created by slowly evaporating the dispersion over a two-hour period at 40°C [5].

REFERENCES

1. Monika B, Amit R, Sanjib B, et al., *Res J Pharm Technol*, **2012**, 5(9):1168-1176.
2. Prithviraj C, K DB, Sanjib B, et al., *Res J Pharm Technol*. **2009**, 2(1):168-172.
3. Ghosal K, Rajan R, Nanda A. *Int J ChemTech Res*. **2009**, 1(4):1128-1130.
4. Lohora D, Attri K, Yadav M. *SPER J Pharm Res*. **2016**, 1(1):24-28.
5. Mishra MK, Sharma R, Ray D. *Lat Am J Pharm*. **2011**;30(7):1291-1297.