An Elsevier Indexed Journal ISSN-2230-7346

Journal of Global Trends in Pharmaceutical Sciences

A REVIEW ON LIQUISOLID COMPACT TECHNOLOGY: AN EMERGING ADVANCE TECHNIQUE FOR ENHANCEMENT OF BIOAVAILABILITY

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ARTICLE INFO

Key Words

Liquisolid technique, bioavailability, dissolution, surface area

Access this article online
Website: https://www.jgtps.com/
Quick Response Code:

ABSTRACT

Liquisolid technology is an effective method to increase the bioavailability of water-insoluble drugs (BCS class II Drugs). Liquisolid technology can transform the drug by converting it into an immediate release or sustained release formulation. The liquisolid technique is a promising technique that reinforces the dissolution rate and the bio-availability of a poorly soluble, liquid drugs, insoluble or lipophilic drugs. Out of many techniques available, liquisolid system has the ability to enhance the dissolution rate of poorly water-soluble drugs. The objective of this article is to present an overview of the liquisolid technique and summarize its applications in the pharmaceutical world. Its application to convert the non-volatile liquid vehicle, liquid solution, or suspension which contains the drug, into acceptably flowing and compressible powders by mixing with selective powder excipients. Furthermore, the use of alternative polymers like Eudragit and HPMC in the liquid may lead to sustained release of a drug. This is an easy manufacturing method with low production costs for enhancing the solubility of poorly water-soluble drugs. There are three main proposed mechanisms of this technique by which bioavailability of a drug can be increased firstly by an increase in a surface area of drug, secondly by increasing aqueous solubility of the drug and lastly by improving the wettability of the drug.

INTRODUCTION

The solubility of drugs is considered as the major aspect while designing any pharmaceutical formulations. Dissolution is the main issue for the absorption of water-insoluble and poorly soluble drugs. It is considered as a rate-limiting step for many of the pharmaceutical formulations[1]. There is a number of the techniques available to improvise the dissolution profile, the absorption potency, and bioavailability of water-insoluble drugs[2]. For the Class II drugs of BCS classification i.e., water-insoluble drugs, the rate of oral absorption is usually controlled by the rate of absorption of a drug in the gastrointestinal tract (GIT). Therefore, in conjugation with permeation, solubility, and rate of dissolution profiles of drugs have a major impact on its oral bioavailability. By an admixture of selected powdered excipient, it is possible to convert drug solution or liquid medicaments to moderately flowing powder. Some investigators have used an identical

approach to extend release profiles of many water-insoluble drugs [3]. According to the report, there are more than half of the newly developed drugs and most of the synthesized chemical entities which are having solubility issue[4]. To explain the drug absorption via the oral route of solid dosage form, there are two consecutive transport processes. First, drugget dissolve in vivo to produce a solution and the second is the transport of this dissolved drug across the gastrointestinal (GI) membrane[5]. This liquisolid technique is an advanced and recent developed technology that can be helpful in the enhancement of the dissolution rate by overcoming several kinds of barriers. This technique was first introduced by Spireas et al. and the rapid dissolution of a solid dosage form containing insoluble drug can also be achieved by this technique. The basic principle of this system is that it holds liquid medicament i.e., liquid drugs, drug solutions, or suspensions in the powdered form, it is as similar as soft gelatin capsules containing liquids. This technique refers to the conversion of medications that are in liquid form to the dry, non-adherent, free flowing, and compressible powder mixtures, this is achieved by blending the liquid medications with appropriate excipients, which are usually referred as carriers and coating materials[6]. The powders prepared using liquisolid compacts are having acceptably flowing and compressible property. The liquid medication is the water-insoluble drug carried in appropriate non-volatile solvents. It is the conversion of liquid medication to a free-flowing powder by the addition of appropriate excipients. The concentrations of the carriers, coating materials, disintegrants, lubricants, and glidants are optimized to induce a non-sticky simply compressible blend. The dissolution of the poorly water-soluble drug is ensured by this technique since before converting the liquid medicament into the free-flowing mass its solubility is checked in the appropriate solvent. Various techniques which can be used to enhance drug solubility is shown in **Figure 1**.

CONCEPT[8]: The drug in the liquid phase is incorporated in the carrier material having a porous surface and thoroughly matted fibers in its interiors for example celluloses, in which mutual absorption and adsorption take place. At first, the liquid is absorbed in the interior of the particle this liquid is captured by the internal structure of the particle. After that, the saturation of the above process is achieved and adsorption in the internal and external surface of the porous carrier particle occurs. Then, the desirable flow property is provided using coating material which has high adsorptive properties. In this liquisolid technique, the drug (liquid form) in the liquid vehicle is carried by powder particles like microcrystalline cellulose and silica. Thus, the enhanced oral bioavailability is expected to be shown due to significantly raised wetting properties and increased surface area of the drug available for dissolution. Since the dissolution of non-polar drugs is the rate-limiting step of GIT, the oral bioavailability of water-insoluble drugs is improved when it is in a liquid solution. That's why it is seen that the bioavailability is higher in soft gelatin elastic capsules containing solutions than the conventional oral solid dosage forms. A similar principle is applied to liquisolid compacts for drug delivery and is highly responsible for the improved dissolution profile.

PRINCIPLE [9]: In liquisolid technique, powder with free-flowing property and willingly compressible can be obtained simply by physically blending the liquid with appropriately selected excipients which are the carrier or coating material. A drug in the liquid portion can be the suspension of the drug, liquid drug, or in the suitable non-volatile liquid vehicle which is added to the porous carrier material. Inert substances like propylene glycol, liquid polyethylene glycols, or glycerin are water-miscible organic solvent systems with a high boiling point are the most suitable as liquid vehicles. Once the saturation of the carrier with the liquid takes place, a liquid layer is developed on the particle surface which is rapidly absorbed by the fine coating particles. Thus, an dry, free-flowing, and compressible powder is obtained. Frequently, the coating material used is amorphous silicon dioxide (colloidal silica) and microcrystalline cellulose is an active carrier material. Numerous excipients like lubricants and disintegrants could also be supplemental to the liquisolid system to produce liquisolid compacts. Poorly soluble liquisolid compacts medicaments

generally have a solubilizing vehicle which promotes increased drug release due to increased surface area of the drug which leads to an increase in wetting property of the drug particle and therefore the aqueous solubility of the drug increases. Consequently, this improved drug release, might lead to better drug absorption in the gastrointestinal tract and so, an improved oral bioavailability.

Need of liquisolid system [10]: The oral route had been the most favored route for the administration of the drug as it is most convenient, highly compliable with patients, and has the lowest production cost than others. If the drug is administered orally then it becomes necessary for a drug to get dissolved in the G.I fluid. Thus, for the newly developed drug, solubility is the key challenge as calculated 40% of them are highly insoluble or poorly soluble in water. Remaining, up to 50%are such kinds of drugs that are agonized to the formulation issues linked with their low solubility and high lipophilicity. Bioavailability of poorly water-soluble i.e. hydrophobic drugs (class II in BCS Classification) is limited by their solubility and dissolution rate. By decreasing the particle size, crystallinity, or by just increasing the surface area, the dissolving property of such drug medicaments can be improved. Many studies are used to increase the dissolution rate of drugs by simply decreasing the particle size, or by simply just converting into the nanoparticles and microparticles. To beat such kind of techniques, 'liquisolid compacts' could be a new and promising approach towards dissolution improvement. Liquisolid compacts own acceptable flowability and compressibility properties.

DEFINITIONS [11]

The variant definitions which are employed in liquisolid technology are:

Liquid medication: The medicament consisting of the liquid lipophilic drugs, suspension, or the solutions of the solid drugs in an appropriate non-volatile solvent system.

Liquisolid systems: Generally, referred to powdered forms of liquid medications formulated by converting liquid lipophilic drugs or drug suspensions or solutions of water-insoluble solid drugs in suitable non-volatile solvent systems, into dry, non-adherent, be free and partially compressible powder admixtures by blending with selected carrier and coating materials.

Liquisolid formulations for sustained drug release [12]: The liquisolid technology is a quite novel and promising technology leading to a sustained release pattern with zero-order kinetics. The development of oral sustain release dosage forms is beneficial for the best medical care in terms of safety, effectiveness, and compliance. There are many strategies for the preparation of liquisolid sustain release formulations, among that the most important methodology is to regulate drug dissolution or prolonged drug release. The release rate also can be increased by the encapsulation of drug particles by the hydrophobic carrier. Therefore, it results in poor wettability leading to slow disintegration and more prolonged drug release. The polymer's glass transition temperature (Tg) is reduced by the non-volatile solvents which impart flexibility. If the temperature is above Tg, the coalescence of polymer particles occurs and forms a fine network and a matrix with lower porousness and higher distortion. The liquid vehicle may additionally affect the drug release. A comparison of drug release from conventional matrix tablets and liquisolid compacts, each containing Eudragit RS & RL as matrix-forming material, showed the retardation results, in liquisolid compacts with polysorbate 80 as a liquid vehicle is a way of a lot of pronounced than conventional matrix tablets. This confirms the vital role of liquid vehicle in sustained drug release from liquisolid matrix systems. A drug used in liquisolid formulation for the sustained release is shown in **Table 1**.

mechanisms of enhancement of solubility and bioavailability [13]: Several mechanisms for increasing drug release are hypothesized for liquisolid systems. The three main proposed mechanisms embrace a surface area of the drug to be enlarged for attainable release, the aqueous solubility of the drug increased due to the presence of a non-volatile vehicle and improving the wetting property of the drug particles due to use of the co-solvent vehicle.

Table 1: Drug used in liquisolid formulation for sustain release:

Drug/Co-solvent	System	Carrier material	Coating material	Binder	Result
Nifedipine11/PEG 400	DS	Avicel PH 200	Cab-o-sil M5	HPMC	Enhanced drug release rates compared to commercial product

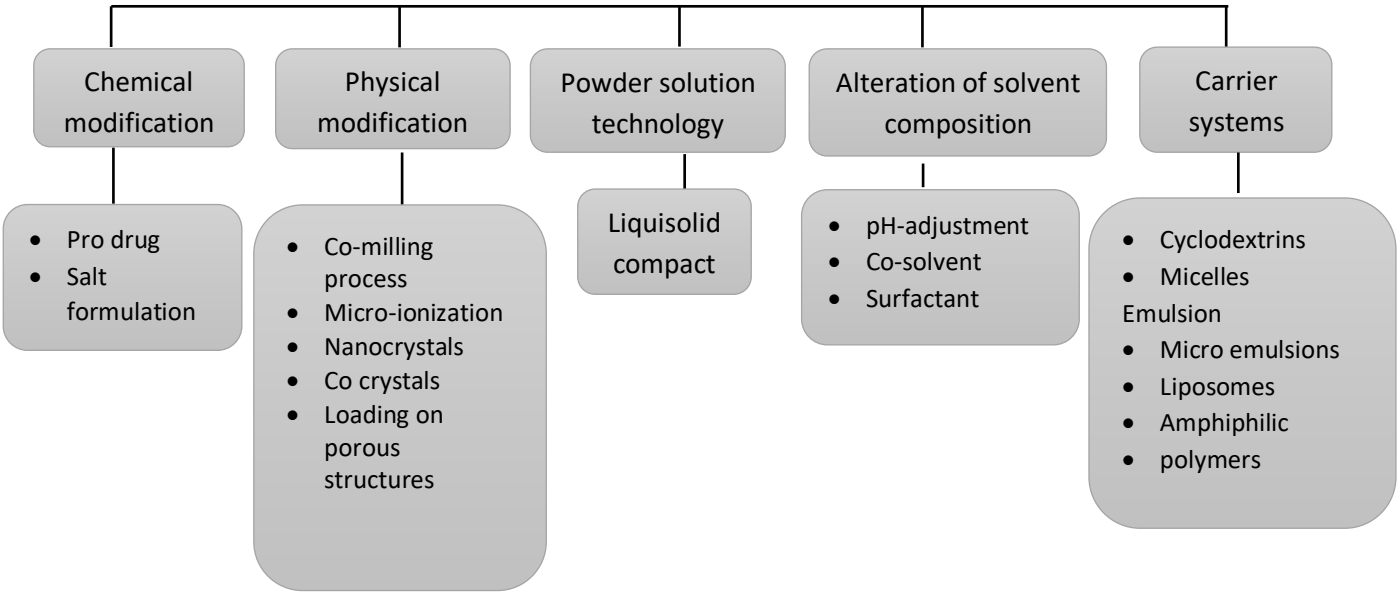

Figure 1: Various techniques that can be used to enhance drug solubility[7]

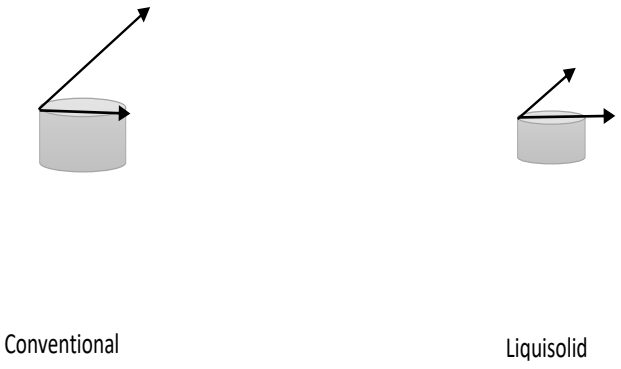

Figure 2: wetting property of liquisolid system

Table 2: Optimization of formulation parameters for liquisolid systems:

Formulation parameter	Optimization	Effect
Liquid vehicle	High drug solubility in vehicle	Increased fraction of the molecularly liquid drug(FM)
Carrier and coating materials	High specific surface area	Increased liquid load factor (Lf)
Addition of excipients	Polyvinylpyrrolidone (PVP)	Increased liquid load factor (Lf), Increased viscosity of liquid vehicle, inhibition of precipitation
Excipient ratio (R)	High R-value	Fast disintegration, inhibition of precipitation

Table 3: Drugs with different liquid vehicles, carrier and coating materials for liquisolid technology [24]

Drug	Liquid vehicle	Carrier and Coating material
Aceclofenac	PEG	MCC and HPMC
Carbamazepine	PEG 200	MCC and Colloidal silica
Famotidine	PG	MCC and Colloidal silica
Fenofibrate	PEG 400	MCC and Colloidal silica
Fenofibrate	PG	MCC and Colloidal silica
Furosemide	Synperonic PE/L	MCC and Colloidal silica
Glibenclamide	PEG 400	MCC and Colloidal silica
Griseofulvins	PEG 400	MCC and Colloidal silica
Hydrochlorothiazide	PEG 200	MCC+Magnesium carbonate and colloidal silica
Hydrocortosone	PG	MCC and Colloidal silica
Hydrocortisone	PEG 400	Various Silica
Ibuprofens	PEG 300	MCC and Colloidal silica
Indomethacin	PG	MCC and Colloidal silica
Indomethacin	PEG 400	MCC and HPMC
Lamotrigin	PEG 400	MCC and Colloidal silica
Methyclothiazide	PEG 400	MCC and Colloidal silica
Naproxen	Cremophore EL	MCC and Colloidal silica
Piroxicam	Polysorbate 80	MCC and Colloidal silica
Piroxicam	PG	MCC and Colloidal silica
Polythiazide	PEG 400	MCC and Colloidal silica
Prednisolone	PEG 400	Various Silica
Prednisolone	PG	MCC and Colloidal silica
Prednisone	PEG 400	Various Silica
Repaglinide	Polysorbate 80	MCC and Colloidal silica

A. Increased Effective Surface Area:

In the liquisolid system, if the drug is completely dissolved within the liquid vehicle, it is placed in the powder substrate still during a solubilized and molecularly distributed state. Therefore, the surface area of drug present for release is way larger than that of drug particles indirectly compressed tablets. Subsequently, if the drug content exceeds the solubility limit, thus the release rate of the drug decreases with the increased fraction of undissolved drug in

the liquid state. With varied drugs, it can be shown that the release rates are directly proportional to the fraction of the molecularly dispersed drug (FM) within the liquid formulation. FM is outlined by the Scientist Spireas because of the ratio between the drug's solubility (Sd) in the given liquid vehicle and also the actual drug concentration (Cd) during this vehicle carried by every system. Therefore,

$$FM = Sd/ Cd$$

Also, it is thought that the adsorption and absorption of the molecularly dispersed drug onto the surface and in the interior of carrier particles impart exaggerated effective surface area obtainable for the mass transfer throughout the drug dissolution method.

B. Increased Aqueous Solubility: With the primary mechanism of improvement of drug release, the drug solubility can likely be increased with liquisolid systems. To increase the solubility of the drug in the aqueous medium the fairly small amount of liquid vehicle is not adequate. However, in the micro-environment of the solid/liquid interface between each primary liquisolid particle and also the release medium, it is possible that the amount of liquid vehicle diffusing out of one liquisolid particle along-side the drug molecules can be sufficient to outspread the aqueous solubility of the drug if the liquid vehicle acts as a cosolvent.

C. Improved Wetting Properties:[14] Due to the very fact that the liquid vehicle will either act as a surface-active agent or can have a low surface tension, wetting of the first liquisolid particles is improved. The wettability of these systems can be explained by contact angles and water rising times. Compact of liquisolid show lower contact angles differentiated to conventional tablets due to the existance of a surface-active agent, for example, Polysorbate 80. Additionally, the adsorption of the drug on the carrier particles will increase the effective surface area, improving the contact of drug and wettability. Comparison between liquisolid tablet and the conventional wetting propertybetween liquisolid tablet and conventional wetting property are shown in the Figure 2.

COMPONENTS OF LIQUISOLID SYSTEM

The major formulation parts of liquisolid compacts are:

Carrier Materials: These are compression-enhancing, comparatively massive, ideally porous particles possessing a sufficient absorption property that contributes to liquid absorption only the convenient amount of liquid is retained by the carrier and coating materials, maintaining the acceptable flow and compression property at constant time. Therefore increasing the moisture content of carrier material will likely end up to decreased flowability of the powder such as Microcrystalline cellulose, Avicel PH 102 and 200 Lactose, Eudragit RL, and RS (to sustain drug delivery), etc[15]. Carrier selection depends on its liquid binding capacity, the flowability of powders, and compressibility [16].

Coating Material [17]: Coating material with high adsorptive property, used for coating the carrier particles will absorb the excessive non-volatile solvent layer over the carrier particles and may provide dry solid appearance to saturated carrier particles having a liquid external layer of non-volatile solvent. Therefore, it will provide dry, non-adherent, free-flowing powder particles. e.g. Silica of assorted grades like Cab-o-Sil M5, Aerosil 200, Syloid 244 FP, etc.

Nonvolatile solvent[18]: Solvents used in this system are non-volatile, water-miscible, inert, and not extremely viscous. They must have a high boiling point, possess good solubilization power for drugs used. Binding action can also be provided at intervals for the formulation with the assistance of nonvolatile liquids. E.g. Glycerin, Polysorbate 80, Propylene glycol, Polyethylene glycol 200, and 400.

Disintegrant: Disintegrants affect the drug release, commonly used disintegrants having the potential to increase the amount of drug in the liquisolid system, and reducing the weight of the tablet is sodium starch glycolate and croscarmellose sodium.

CLASSIFICATION [17]

A. Based on the liquid medication, it divided into 3 sub-groups:

1. Powdered drug solutions

2. Powdered drug suspensions

3. Powdered liquid drug

The two major sub-groups are additionally made up of the conversion of drug solutions or drug suspensions (e.g. gemfibrozil suspension in Polysorbate 80), and the formulation of liquid drugs (e.g. clofibrate, valproic acid, liquid vitamins, etc.), into liquisolid systems.

B. Based on the formulation technique, liquisolid systems are classified into 2 groups,

1. Liquisolid compacts: It refers to immediate sustained-release tablets or capsules that are described below liquisolid systems.

2. Liquisolid microsystems: It refers to capsules prepared by liquisolid systems with the inclusion of associate additives resultant in a unit size which will be five times less than that of a liquisolid compact.

Theory [19]

The Ø-value of powder is defined as the maximum amount of a given non-volatile liquid that can be retained inside its bulk while maintaining an acceptable flowability.

The liquid load factor that ensures acceptable flowability (ØLf) can be determined by:

$$Lf = Ø + φ (1/R)$$

Where, Ø and φ is the Ø-values of the carrier and coating material, respectively. Where, Ø and φ is the Ø-values of the carrier and coating material, respectively.

$$R = Q/q$$

R represents the ratio between the carrier weight (Q) and the coating (q) material present within the formulation.

By using the following equation we can measure the quantities of carriers (Q0) and coating (q0) materials are required to convert liquid formulation (W) into acceptably flowing and directly compressible powder.

$$Q0 = W/L0$$

$$q0 = Q0/R$$

Liquisolid compressibility test (LSC) [20]: It was developed to determine Ψ values and includes steps like preparing carrier coating material admixture systems, preparing many uniform liquid/powder admixtures to the tablets, for determining average hardness, the activity of average liquid content of crushed tablets, besides determining plasticity, sponge index, and Ψ value and Lf. Calculated quantities of the drug are added to the non-volatile solvent and heated to dissolve the drug. This liquid drug solution is further added to the carrier and coating materials and then it mixed properly. The blending method is carried out in 3 steps

• The system is mixed at a rate of one rotation per second for about one minute so that the drug gets distributed equally in liquid.

• This admixture is uniformly spread across the motor surface and left for 5minssothat drug gets absorbed into the powder particle.

• Then powder is scraped off and blended with other excipients for another 30sec. This provides the ultimate formulation of liquisolid compact.

Liquisolid formulation to enhance drug release [21]: The preparation of liquisolid systems is relies on the principles of conversion of the drug in the liquid state into a free-flowing, promptly compressible, and dry powder by simple physical blending with selected excipients, carriers, and coating materials(30). The Liquisolid tablet preparation methodology involves, mathematically calculated quantity of pure drug weighed and dissolved within the appropriate quantity of solvent in a molecularly distributed state. For attaining good flow properties, trial and error strategies are used i.e. changing the carrier: coating material quantitative ratio from 50:1 to 5:1 ratio according to new mathematical model expressions proposed by Liao. The liquid

medication is absorbed into the carrier material internally and externally and an appropriate disintegrant was further added to this material. Finally, coating material was added to dry looking, adherent to the carrier material for achieving good compression properties. Liquid medication that incorporates into carrier material encompasses a porous surface and closely matted fibers in its interior as cellulose. Each absorption and adsorption take place, i.e. first, the liquid absorbed into the inside of the particles is captured by its internal structure, and once saturation of this method, adsorption of the liquid onto the inner and external surface of the porous carrier particles eventuate. A large surface area and high absorptive properties of the coating material provides the Liquisolid system the actual flow properties delineated (Martin et al., 1983; Spireas et al., 1992). Solubility studies were conducted for the choice of the high solubility of the pure drug form in the nonvolatile solvents. This involves, dissolving of the pure drug in various non-volatile solvents, this involves pure drug dissolved in several non-volatile solvents. Excess amounts of the pure drug were further added to the non-volatile solvents, followed by saturation solution transfer to a rotatory shaker for 48 hours at 250c under constant vibration. After 48 hours the saturated solution was filtered through a 0.45 μm Millipore filter and analyzed.

Optimization of liquisolid formulations with enhanced drug release [22]

This technique is applied to a low dose, poorly water-soluble drugs. One of the limitations of the liquisolid technique is formulating a high dose, poorly water-soluble drugs. As the release rate is directly proportional to the fraction of molecularly distributed drug (FM) within the liquid formulation, a higher drug dose needs higher liquid amounts for the desired release profile. Moreover, to get liquisolid systems with suitable flow property and compatibility appropriate carrier and coating materials are required. However, this leads to a rise in tablet weight which ultimately increases the tablet sizes that are difficult to swallow. Therefore, to overcome this and numerous alternative issues of liquisolid technology, many formulation parameters could be optimized. Parameters for optimization of formulation in liquisolid technique with immediate drug release shown in the **Table 2**.

Stability of liquisolid systems with enhanced drug release [23]

To get information on the stability of liquisolid systems, the effect of the storage on the release of drug and breaking strength of the tablet is noted. Stability investigations of liquisolid systems containing polythiazide (40 °C/ 42 and 75 % R.H., 12 weeks), hydrocortisone (ambient conditions, 10 months), carbamazepine (25 °C/ 75 % R.H., 6 months), indomethacin (25 °C/ 75 % R.H., 12 months), piroxicam (25 °C/ 75 % R.H., 6 and 9 months, respectively), or naproxen (20 °C/ 76 % R.H., 4 weeks) indicated that storing at various conditions neither affected the hardness nor the release profiles of liquisolid compacts. This implies the innovation might be a promising method to fortify the release rate while not having any physical stability issues. Drugs with different liquid vehicle, carrier and coating material used in liquisolid technology are shown in **Table 3.**

List of Drugs that can be incorporated into liquisolid systems [25]

• *Antihistaminic*: Chlorpheniramine
· *Antiarrthymic*: Digoxin, Digitoxin
· *Antihypertensive*: Nifedipine
· *Antilipidemic:* Clofibrate, Gemfibrozil
· *Antiepileptic*: Carbamazepine, Valproic acid
·*Chemotherapeutic agent*: Etoposide
·*Diuretics:* Hydrochlorothiazide, Methylchlorthiazide, Polythiazide, Spironolactone,
Glucocorticoids: Prednisolone, Hydrocortisone prednisone
NSAIDS: Piroxicam, Indomethacin, Ibuprofen
Water-insoluble vitamins: Vitamin A, D, E, and K

ADVANTAGES [12, 14, 26]

Liquisolid tablets have many advantages. These include:

• This are low-cost formulations than soft gelatin capsules.
• Drugs with poor aqueous solubility are often formulated into a liquisolid system.
• It exhibits improved solubility and dissolution.

• Liquisolid systems can also be used to formulate sustained release tablets of water-soluble drugs.
• Simple technique and do not require any specialized equipment.
• Capability of commercial production is additionally attainable**.**
• Sustained release liquisolid tablets or capsules of water-insoluble drugs show consistent dissolution rates (zero-order release) comparable only to expensive commercial preparations that combine osmotic pump technology and laser-drilled tablets.

• Orally administered water-insoluble drug has Better availability. Enhanced bioavailability can be obtained as compared to conventional tablets.

DISADVANTAGES [11, 27]

- The liquisolid systems have low drug loading capacities and need high solubility in anon-volatile liquid vehicle.
- It needs highly efficient excipients that have higher adsorption capacities which give faster drug release with a smaller tablet size to enhance liquisolid formulations.
- Acceptable compression properties might not be achieved since throughout compression liquid drug could also be squeezed out of the liquisolid tablet leading to tablets of failing hardness.
- This technique is merely for water-insoluble drugs. However, for the formulation of high dose insoluble drugs using the liquisolid technique is not possible.
- To achieve acceptable flowability and compatibility for liquisolid powder formulation, high levels of carrier material and coating materials should be added which increases tablet weight.

APPLICATIONS [28, 14]

- Liquisolid compact technology is a powerful tool to improve the bioavailability of water-insoluble drugs. Various poorly soluble drugs on dissolving in different non-volatile solvents have been formulated into liquisolid compacts.
- Bio-availability of BCS class II and class IV drugs gets enhanced by using liquisolid technology.
- Liquisolid systems are stable for drugs exhibiting polymorphism. In these systems, the solution of drug in a nonvolatile solvent is quickly converted to dry free-flowing powder. Release rates of the many poorly water-soluble drugs get increased by using a liquisolid system.
- It is additionally used for designing a controlled drug delivery system.
- Liquisolid technique is effectively used for the formulation of the many water-insoluble or liquid lipophilic drugs.
- It is also used to formulate sustained release dosage form.
- Applied in probiotics. Improvement of drug photostability can be achieved.

EXPERT OPINION[15]

With the arrival of high-throughput screening and combinatorial chemistry, it has been shown that most of the new chemical entities have high lipophilicity and poor aqueous solubility, hence, poor bioavailability. To enhance the bioavailability, the release rate of these drugs should be enhanced. Even though there are manifold technologies to gear this issue, they are not cost-effective because of the inclusion of sophisticated machinery, advanced preparation techniques, and complicated technology. As the liquisolid technology uses an identical production process similar to conventional tablets, this technology enhances the release rate of poorly water-soluble drugs with low production costs. Moreover, as the route of administration of this type of formulation is an oral route, the patient compliance for the products obtained by the liquisolid technology is going to be high. This technology also has the potential to slow down drug release and allows preparing sustained-release tablets with zero-order drug release pattern. The excipients required for this technology are conventional and commonly available within the market. The technology is in the early stages of its development with extensive research currently focused on. It is predicted that the liquisolid compacts could play a crucial role in the next generation of tablets.

CONCLUSION

The liquisolid technique is a simple technique having low production cost and do not require any specialized equipment which is a promising alternative to enhance the absorption as well as dissolution rate thereby enhancing the bioavailability of a poorly soluble, liquid drugs, insoluble or lipophilic drugs. Liquisolid tablet which is a Conventional formulation approach may fail to achieve the desired dissolution and bioavailability for such drugs, but with the Liquisolid technique the drug can be designed into immediate releases or sustained-release systems and the desired dissolution and bioavailability can be achieved. This technique has the potential to be safer and hence should be considered to be manufactured on a large scale.

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