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FORMULATION AND EVALUATION OF ORAL MEDICATED JELLIES: A COMPARATIVE REVIEW OF SELECTED DRUGS

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ABSTRACT

Oral medicated jellies have emerged as a patient-friendly, palatable, and convenient alternative dosage form designed to improve compliance, particularly among pediatric, geriatric, and dysphagic populations. This review comprehensively discusses the formulation principles, polymers, gelling agents, sweeteners, preservatives, and evaluation parameters associated with medicated jellies, along with their advantages over conventional oral solid and liquid dosage forms. Key formulation components—including natural and synthetic polymers such as pectin, gelatin, Carbopol, and sodium alginate—are examined with respect to their gel-forming ability, stability, and compatibility with active pharmaceutical ingredients. The article highlights critical evaluation parameters such as organoleptic properties, pH, viscosity, gel strength, syneresis, drug content uniformity, and in-vitro release behaviour. Recent studies demonstrating improved bioavailability, rapid disintegration, ease of administration, and enhanced therapeutic outcomes with various drug categories are also summarized. Overall, oral medicated jellies represent a versatile and effective platform for delivering drugs that require improved palatability, faster onset of action, or alternative administration routes, with promising potential for future pharmaceutical innovation.

KEYWORDS: Medicated jellies, organoleptic properties, bioavailability, dysphagic, pediatric, geriatric.

INTRODUCTION

Despite great advances in drug delivery, the oral route remains the most popular method for the administration of medicinal agents because it is cost-effective, easy to use for providing therapeutic agents, and promotes patient compliance. Furthermore, it is considered the most cost-effective and safest method of medication administration.

Patients are often comfortable with orally administered medications because they are less invasive than parenteral distribution of medication. Approximately 80% of all therapeutic/medicinal drugs are administered orally. Tablets, capsules, and granules continue to be the most popular dose forms. As a result, advancements in oral medication delivery technology are critical in meeting people's requirements and providing patients with safe and effective treatment. Oral dosage forms account for the bulk of the drug distribution market due to their numerous benefits, including safety, efficacy, cost-effectiveness, and patient compliance when compared to other modes of delivery. Among the different pharmaceutical dosage forms, oral dosage forms have the most optimal characteristics.[1]

On the other hand, dysphagia is one of the barriers to oral medication delivery that many patients, especially those in the pediatric and elderly populations, face. Dysphagia increases the danger of choking on liquid preparations and makes it harder to swallow traditional solid oral medications. To make them easier to swallow, patients typically attempt to shatter hard tablets or open capsules and combine them with food or water. Inaccurate dosage altered medication release and absorption, and unfavorable drug taste and palatability can all arise from such conduct.[2]

Like gelatinous foods and confections, jelly is one of the suitable alternative oral dose forms available today. In addition to ensuring patient safety and convenience of handling, the jellies can help with swallowing issues and be eaten without water. As a result, jellies can enhance patient compliance in addition to their delicious flavour and attractive look. Both liquid and solid treatments have benefits for jellies.[3]

Jellies history

Oral medicated jellies have been used for therapeutic purposes since ancient times.

In Ancient Greece and Rome (500 BCE - 500 CE): Medicinal jellies were created using honey, fruit, and herbs to treat various diseases.

During Medieval Europe (500 - 1500 CE): Apothecaries made medicinal jellies with sugar, honey, and fruit to give medications.

In the 1800s: The invention of gelatin and pectin led to more stable and reliable medical jellies.

In 1867: Japanese pharmacists invented jellies to give traditional Chinese remedies.

In the 1900s: Drug manufacturers began mass-producing medicinal jelly with sophisticated production techniques.[4]

In 1925: The 4th edition of the Japanese Pharmacopeia established a new standard for medicinal jelly, specifying the base, active substances, and packaging.

In the mid-20th century (1950s-1960s): New gelling ingredients like carrageenan and xanthan gum increased the variety of medical jellies.

In 1961: The 7th edition of the Japanese Pharmacopeia included a monograph on medicated jelly preparation, quality control, and labeling guidelines.

In 1996: The 13th edition of the Japanese Pharmacopeia adopted a new standard for medicated jelly, requiring the use of preservatives, antioxidants, and other ingredients.[5]

Role of Medicated Jellies

The 17th edition of the Japanese Pharmacopeia[6] defines jellies for oral administration as non-flowable gelatinous preparations of a specific size and shape. Jellies are semisolid preparations that are clear, translucent, or nongreasy and can be applied internally or externally. Jellies can be made from natural gums such as tragacanth, pectin, and sodium alginates, as well as synthetic derivatives such as methyl cellulose and sodium carboxymethyl cellulose. Everyone likes jelly to oral liquids or tablets because of its appealing appearance, pleasant taste, and ease of use. Medicated jelly can be used to treat both local oral cavity ailments and systemic conditions. Oral medicated jellies are palatable solid dose forms that are administered in the oral cavity and dissolve in the mouth or pharynx to produce a local or systemic impact.

Drug delivery can be achieved via the buccal, labial, gingival, and sublingual pathways by employing pharmaceutical jellies as a dose form. Multiple medications can be used to treat chronic illnesses. Pharmaceutical jellies are currently available as over-the-counter medications in a variety of flavors, containing pharmaceuticals for anaesthesia, erectile dysfunction, arthritis, hypertension, and sore throat. Jellies can be used to treat psychiatric and neurological conditions such as stroke, thyroid illness, Parkinson's disease, multiple sclerosis, nausea, vomiting, and motion sickness. Patients who have difficulty chewing, are sore, or have a paralyzed lower jaw can readily use medicinal jellies. Jellies are easily employed in youngsters who have lost their primary teeth but still have partial use of their permanent teeth. Medicated jellies can release drugs in the mouth, which are then absorbed through local oromucosal tissues as well as pre-gastric, gastric, and post-gastric portions of the gastrointestinal tract.

The European Medicines Agency considers the following requirements for an optimum paediatric formulation[7]

- The dosage frequency must be minimum
- One dosage form suits everyone or a complete range.
- Minimal influence on lifestyle.
- Excipients should be minimal and non-toxic.
- Convenient, easy, and reliable administration.
- Easily manufactured, attractive, and stable.
- Costs and commercial viability.

Characteristics of medicated jellies

- The orally disintegrating tablet should be unaffected by the properties of the medication and excipients.
- Adaptable and compatible with typical processing and packaging equipment at a low cost.
- Allow for higher medication loading.
- Variations due to changes in environmental conditions should be fewer.
- After oral administration, there should be little or no residue left in the mouth.
- Be portable without any fragility concerns.
- Effective taste masking technology should be used for bitter-tasting medications.
- It should leave little or no residue in the mouth following oral delivery, which is consistent with a pleasant mouthfeel.

Unique features of medically designed oral jellies

Medicated oral jellies provide a variety of unique medication delivery features. Palatability is a fundamental feature of these jellies, which are prepared with flavouring ingredients for a pleasant taste. This

makes them especially appealing to children and the elderly who may struggle to take traditional drugs. Oral jellies are a suitable option for individuals with swallowing issues or who cannot ingest liquids due to their ease of administration and lack of need for water. The combination of superior taste and ease of usage improves patient compliance, leading to greater therapeutic effects. Additionally, oral jellies can be formulated for controlled release, which enables long-term medication administration and lessens the need for regular dosage. Finally, the jelly matrix protects delicate medications from deterioration and guarantees their stability and effectiveness during the course of treatment.[8]

Jellies' classification[9]

Jellies are classified as

i. Medicated jellies

These jellies are primarily applied to the skin and mucous membranes and have spermicidal, local anaesthetic, and antibacterial properties. They retain enough water to provide a local cooling effect after evaporation, and the residual film offers protection. In addition, ephedrine sulphate jelly is a vasoconstrictor, it is used to stop nose bleeding.

ii. Lubricating jellies

These jellies are designed to lubricate diagnostic tools such as catheters, cystoscopes, and surgical gloves.

iii. Miscellaneous jellies

These are designed for a variety of uses, such as patch testing and electrocardiography.

ADVANTAGES OF ORAL MEDICATION JELLIES

- To improve patient compliance, pharmaceutical jellies can be given to patients who are unable to swallow tablets or capsules, such as the elderly, stroke victims, bedridden patients, patients with oesophageal issues, and patients who refuse to swallow, such as pediatric, geriatric, and psychiatric patients.
- Because it is simple to handle and doesn't require water, it can be administered anywhere, at any time.
- Additionally, it can be applied to the systemic distribution of medications that are susceptible to liver or intestinal metabolism.
- Additionally, the medications that are released and ingested from medicated jelly will enter the digestive system either dissolved or suspended in saliva, making them readily accessible.
- Drug release and retention time differences can be addressed by delivering the therapeutic agent to the systemic circulation via the oral mucosa.
- For patients with dysphasia, it is the best way to administer medication since it lowers the danger of aspiration.
- Saliva enhances bioavailability and speeds up the pre-gastric absorption of medications from the mouth, pharynx, and oesophagus.
- Jelly is especially useful for those with disabilities, bedridden patients, travellers, and busy people who don't always have access to water.
- There is a risk of choking while using traditional oral dosage forms, yet use of jellies ensures safety.
- Quick relief: The effects of medicated jellies start working quickly.[10]
- Permit a high drug loading.
- Flexible and compatible with current packaging and processing equipment
- It doesn't require water and can be administered anytime, anywhere.
- It might be especially useful for the systemic distribution of medications that are metabolized in the liver or intestinal wall.

Difficulties in formulating oral medicated jellies[11]

a) Palatability

Improving taste and masking the taste of bitter medications are closely linked to patient compliance.

b) Hygroscopicity[12]

Certain oral jelly dose forms require specific product packaging because they are hygroscopic and require protection from humidity.

c) Dose/Amount of drug

More excipients should be added when a medication has a bitter taste in order to cover it up, which ultimately results in increasing in the dosage form.

d) Aqueous solubility[13]

Various excipients in jelly imparts crystallinity and rigidity for water soluble drugs which forms eutectic mixtures.

e) Size of jelly

The size of a jelly determines how easy it is to consume. According to reports, jelly that is 78 mm in size is the simplest to swallow, while jelly that is larger than 8 mm is the easiest to manage. As a result, it is challenging to get the jelly size that is both manageable and easy to swallow.

f) Limited Shelf Life

Medicated oral jellies may not be as stable as they could be, particularly if they include sensitive medications or are stored in an unsuitable environment.[14]

g) Drug property

A drug's solubility, bulk density, crystal shape, and particle size have an impact the final jelly property.

Disadvantages of oral medication jellies

- Since it is an aqueous-based preparation, the right packaging is necessary to keep the medications stable in different environments.

- If not properly formulated, it could result in a disagreeable flavour.

Excipients used in oral medicated jellies

I. Solidifying agent

These are hydrocolloids, which form gel like matrix. In the liquid phase, it dissolves and forms a weakly cohesive internal structure. Gelling agent examples include:

a) Gelatin

In pharmaceutical preparation, vitamin capsules, cosmetic technology, and photographic emulsions, gelatin is typically utilized as a gelling agent. utilized to administer medication suspended in a biodegradable matrix in implanted delivery systems.

b) Sodium Alginate

The cell walls of brown algae are used to make alginate. Thick gum is created when alginates bind with water. Numerous topical and oral medication formulations contain it. Typically, it serves as a thickening and suspending ingredient in a variety of topical formulations, including gels, creams, and pastes.

c) Pectin

It is a heteropolysaccharide that is extracted from terrestrial plant cell walls. It increases the volume and viscosity of stool and is used to treat diarrhea and constipation. Owing to its lower cost, it is utilized in a number of delivery techniques, including colon-specific drug delivery systems, mucoadhesive, gastroretentive, and controlled release. utilized as a stabilizer in cosmetics as well.

d) Tragacanth

In a variety of pharmaceutical formulations, including emulsions, gels, and creams, tragacanth gum serves as an emulsifying and suspending ingredient. utilized in foods and medications as a thickening, stabilizer, and texturant ingredient.

e) Agar

Agar-agar is a vegetarian substance that can be used in place of gelatin. It is white and semitranslucent, and it comes from algae. It is used in pharmaceuticals and food items as a thickening, gelling agent, texturizer, moisturizer, emulsifier, flavour enhancer, and absorbent.

f) Xanthan Gum

It is frequently utilized in culinary, cosmetic, oral, and topical pharmaceutical formulations as a thickening, emulsifying, suspending, and stabilizing ingredient. used as a binder in toothpaste to maintain consistency. utilized as a thickening agent in shampoos and as a hydrocolloid in food preparations.

g) Carrageenan

It is made from linear sulphated polysaccharides extracted from edible red seaweeds. The food and pharmaceutical industries primarily use them as gelling, thickening, and stabilizing agents. In confections, carrageenan—which is vegetarian—replaces gelatine.

h) Cellulose derivatives

used as a thickening and emulsifier in food and cosmetic preparations. Moreover, it relieves constipation.

II. Sweetening Agent

a) Dextrose

There are two forms of dextrose: anhydrous and monohydrate. The anhydrous form is hygroscopic in nature.

b) Sucrose

Sucrose was most preferred sweetening agent because it is soluble in water, it is economical i.e., its highest purified form can be obtained at reasonable price, physically and chemically stable in different pH. It is widely used in combination with sorbitol, glycerine and other polyols to prevent crystallization of sucrose.

Table 1: Stages of sugar at different temperatures.

Temperature	Stage
~100-110˚C	N/A
~110-113˚C	Thread
~113-118˚C	Soft Ball
~118-121˚C	Firm Ball
~121-132˚C	Hard Ball
~132-149˚C	Soft Crack
~149-155˚C	Hard Crack
~160˚C	Caramelization

Fructose is hydrogenated to produce mannitol, a white, crystalline polyol. Because of its negative heat of solution, it provides a slight cooling effect when chewed or dissolved in the mouth. Due to its poor water binding, it is utilized as a dusting powder on chewing gums. It can be utilized in confections and is thermostable.

c) Sorbitol

Sorbitol is an isomer of mannitol and a sugar alcohol. It has roughly 60% of sucrose's sweetness. It is produced by reducing glucose or using corn syrup. It is used in the manufacture of soft gel capsules, as a laxative, as a humectant and thickening in cosmetics, and to treat hyperkalaemia.

d) Sucralose

It is an artificial sweetener. It is thermostable and also remains stable in wide pH range. Hence it can be used in products that need a longer shelf life. Compared to sucrose onset of sweetness occurs slowly but sweetness remains for longer duration of time.

III. Colourants

Colouring agents are used for the following reasons:

a) To make a dosage form a aesthetic appearance
b) To improve patient acceptability.
c) To maintain uniform colour of the dosage form
d) Helps in differentiating and identifying the goods.

The Food Drug and Cosmetic Act of 1938 categorizes colorants as:

1. FD&C Colours: These approved colorants are suitable for use in drug, foods, and cosmetics.
2. D&C Colours: It consists of pigments and dyes used in drug and cosmetics intended for ingestion and mucous membrane application.

IV. External D&C: It contains colorants that can be used in external preparations, however its use in products meant for ingestion is not considered as safe due to their oral toxicity.

Flavorant

Table 2: Flavours and their principal flavouring agents.

Flavours	Principal Flavouring agents
Mint	Menthol
Clove	Eugenol
Pepper	Piperidine
Lemon	Citral
Garlic	Diallyl disulfide
Fruit	Aldehydes
Turmeric	Curcumin

V. Preservatives: Jellies are highly susceptible to microbiological attack. Preservation is essential to maintaining the product's shelf life and preventing any incompatibilities between gelling agents.

Eg: Methyl Paraben, Propyl Paraben, Benzoic Acid, Benzalkonium Chloride, Chlorhexidine acetate.

VI. Stabilizing agents: The purpose of stabilizers is to preserve the product's desired characteristics. It is used to keep jellies from drying out.

Examples are sorbitol and propylene glycol.

VII. PH Modifiers: pH modifiers are essential buffering chemicals that maximize drug stability, enhance solubility, and stop syneresis (water leakage) in medicated jellies. For the best physical integrity and patient tolerance, they usually aim for a pH between 5.00 and 7.00, ensuring the jelly maintains a safe, pleasant microenvironment.

Eg: Citric acid, Sodium Citrate, Fumaric acid & Tartaric acid.

Method of Preparing Oral medicated jellies[15]

1. Oral medication jellies were made with different polymers in various ratios.
2. First, sucrose and water are combined in the necessary ratio to create a sugar syrup.
3. Adding the necessary amount of gelling agent to this syrup and heating it until it gets dissolved
4. Stabilize the solution, add the solubilizer, and stir until it dissolves.
5. A mixture above is mixed with the preservative.
6. After it has fully dissolved and reached room temperature, the drug is added along with color and flavors.
7. This mixture is combined with the necessary size and shape mold and allowed to solidify into a jelly.

Evaluation parameters of oral medicated jellies[16]

a) Physical characteristics

Physical characteristics of the medicated jelly, such as clarity, texture, transparency, and consistency, can be assessed.

b) Stickiness and grittiness

By gently rubbing the medicinal jelly between your fingertips, you can assess its stickiness and grittiness.

c) Viscosity

A Brookfield viscometer was used to measure viscosity. Spindle number 4 can be used because the system is not Newtonian.

d) PH

A digital PH meter can be used to determine the jelly's PH. The PH should be recorded after 0.5 g of the weighed formulation was dissolved in 50 ml of water.

e) Spreadability

2.5g of jelly should be sandwiched between two glass slides and crushed for five minutes using a 1000g weight. The number of seconds required to separate two slides was recorded. Spreadability was improved with a shorter time interval to span the 7.5 cm distance.

W * L/T = S.

S is the spreadability.

W = weight attached to the upper slide L = glass slide length

T is the time needed to divide two slides.

f) Drug Content

After the jellies were chosen and crushed in a mortar, a drug-equivalent mixture was taken and dissolved in a 100 ml volumetric flask with 6.8 PH buffer, and the final volume was adjusted to the required level. After that, the solution was filtered, suitably diluted, and subjected to spectrophotometric analysis using a uv spectrophotometer.

g) Syneresis

The contraction and separation of water from gel during storage is known as syneresis. Using a lower concentration of the gelling agent is one of the main causes. The majority of low acylated guar gum gels are susceptible to syneresis.

h) Stability Study

Aluminium foils were used to package the jelly formulations, which were then kept in polypropylene containers at 0°C and 25°C/60% RH for ninety days.

i) In-Vitro Dissolution study

The USP paddle apparatus was maintained at 37°C +/- 0.5°C and 50 rpm during the in-vitro dissolution investigation using dissolution medium (900ml). After 10, 20, 30, 40, 50, 60, 90, and 120 minutes, 5 ml of the sample should be removed, and fresh media should be added to maintain the sink condition. A UV spectrophotometer was used to evaluate the drug content of the sample. After absorbance was measured, the percentage of drug release was computed.

Future perspective of oral medicated jellies

With many advantages over traditional oral drugs, oral medicated jellies have become a potential dosing option. They improve patient adherence because they are easier to give and more pleasant, especially for pediatric and geriatric patients. Furthermore, its special formulation speeds up the onset of action and improves bioavailability by facilitating quick drug disintegration and absorption.

Additionally, oral medicated jellies can be designed to release medications in particular gastrointestinal tract regions, maximizing therapeutic efficacy while preventing the degradation of sensitive medications. Additionally, they can accept a wide variety of medications, such as those that have stability problems or poor water solubility, making them a desirable choice for a range of therapeutic uses. Oral medicated jellies offer a novel, creative, and easy-to-use way to administer medications. In the future, oral medication jellies have a great deal of potential as a drug delivery strategy.[17]

A COMPARATIVE REVIEW OF DRUGS FORMULATED AS JELLIES

i. Formulation and Evaluation of Ranitidine HCL oral medicated jellies

The creation and assessment of oral medication jellies containing ranitidine hydrochloride with the goal of enhancing patient compliance for elderly and pediatric patients. The study uses a jelly matrix made of sucrose and natural polymers like pectin to cover up the drug's strong bitterness. Thorough preformulation investigations, such as FTIR and DSC analysis, were carried out by researchers to verify that the medication remained stable and compatible with the selected excipients. To guarantee a high-quality formulation, evaluation of the finished product concentrated on crucial factors like pH levels, spreadability, microbiological stability, and syneresis. According to the findings, an optimized batch (F4.3) was able to achieve over 50% dissolve in fifteen minutes while effectively limiting drug release in simulated saliva. In the conclusion, the sources portray these innovative jellies as a consumer-friendly, biodegradable, and successful substitute for conventional oral dose forms in the treatment of peptic ulcers.[18]

ii. Formulation and evaluation of oral Aceclofenac medicated jellies

This study describes the development of oral medication jellies with aceclofenac that are meant to help relieve menstrual cramps. The authors used materials including gelatin, sucrose, and china grass to create a semi-solid delivery system by boiling and congealing the mixture. The goal of this novel form is to offer a more patient-friendly substitute for conventional tablets, which frequently irritate the stomach. Six distinct formulations were evaluated for pH, viscosity, and drug release using a variety of tests; F6 was found to be the most successful. The improved jelly retained its chemical and physical integrity, according to stability tests conducted over a three-month period. The study's overall findings indicate that these jellies provide a dependable and practical way to treat dysmenorrhea-related pain.[19]

iii. Formulation and evaluation of oral medicated jelly of meclizine HCL

This study describes the creation and assessment of oral medicated jellies that include meclizine hydrochloride, an antihistamine used to treat nausea, vomiting, and motion sickness. Using gelling chemicals including gelatin, pectin, and sodium alginate, researchers created a variety of jellies that are soft and easy to swallow in place of conventional tablets or syrups. The study emphasizes the benefits of jelly dosage forms, including improved patient compliance—especially in children—and their capacity to be ingested without water. The product's physicochemical characteristics, such as pH levels, viscosity, and medication content homogeneity, were evaluated by a number of tests. The drug is released efficiently, according to the results of in-vitro dissolution studies, and the majority of formulations exhibit good texture and excellent stability. The authors come to the conclusion that these medicated jellies provide a useful, elegant, and patient-friendly way to provide acute medication.[20]

iv. Formulation and evaluation of oral medicated jelly of salbutamol sulphate

The formulation and evaluation of pediatric-friendly oral jellies with salbutamol sulfate to treat asthma and respiratory conditions is examined in this study. Researchers created these soft-textured substitutes using a variety of gelling agents, such as gelatin, methyl cellulose, and sodium CMC, because youngsters frequently have trouble swallowing solid pills. According to the study, these medicated jellies release the active ingredient quickly for quick relief and are visually clear and non-sticky. The medicine remained stable and effective when combined with these particular jelly bases, according to lab results. Because of their higher dissolve rates and ideal uniformity, the formulations designated F5 and F7 were ultimately found to be the most successful. These results imply that oral jellies are a patient-friendly way to increase young patients' adherence to their treatment plans.[21]

v. Formulation and evaluation of oral brivaracetam medicated jelly

In order to enhance treatment adherence among pediatric epilepsy patients, Brivaracetam-loaded medicated jellies were developed and evaluated. The study uses gelling ingredients such as gelatin, sodium alginate, and pectin to create a palatable, easy-to-swallow oral dose form in order to address the challenges children encounter while ingesting conventional pills. Critical quality parameters, such as pH compatibility with oral mucosa, medication content homogeneity, and physical texture, were assessed by researchers for twelve distinct formulations. According to the results, Batch F11 —a blend of sodium alginate and gelatin—provided optimal viscosity and regulated drug release and was the most successful. This novel jelly shape provides a patient-friendly alternative to traditional antiepileptic medications by hiding the harsh taste of the drug and guaranteeing reliable administration. Overall, the results indicate that these medicated jellies may improve the quality of life and treatment results for young patients with long-term seizure disorders.[22]

vi. Formulation and evaluation of oral Olmesartan medoxamil medicated jelly

The research describes how Olmesartan medoxomil, a medication used to treat hypertension, is made into oral medicated jellies. These cutting-edge jellies are made especially for dysphagic patients—children and the elderly, for example—who have trouble swallowing conventional tablets. In order to create a dosage form that provides improved bioavailability and patient compliance, the study makes use of natural polymers including gelatin and almond gum. Because formulation F5 had the best viscosity, stability, and drug release profile, the researchers found it to be the most effective after thoroughly testing several batches. The source ultimately comes to the conclusion that these jellies offer a practical and affordable substitute for traditional high blood pressure drugs.[23]

vii. Formulation and evaluation of oral glibenclamide medicated jelly

This study investigates the development of a medicated soft jelly as a convenient substitute for conventional tablets in the management of Type-2 diabetes. Glibenclamide, a medication that usually has poor solubility and is challenging for elderly or pediatric patients to swallow, was used by scientists to create these jellies. The researchers combined guar gum and pectin to make a high-viscosity beverage that conceals the disagreeable taste of the drug and reduces the risk of dysphagia. Because of its greater stability, uniformity, and drug release capability, Batch F5 was determined to be the best variant after extensive testing. The study comes to the conclusion that these unit-dose jelly packs offer vulnerable groups a more practical and dependable way to control their blood sugar levels.[24]

viii. Formulation and evaluation of oral domperidone medicated jelly

This study describes the development of an oral medication jelly that contains domperidone and is intended mainly to help elderly and pediatric patients who have trouble swallowing conventional tablets. After experimenting with different formulas using a heating and congealing technique, the scientists found that a mixture of sucrose and gelatin produced the optimum texture and stability. By releasing more than 98% of the medication in less than 25 minutes, the optimized jelly (F5) outperformed conventional soft chew alternatives in terms of drug content and dissolution rates. The preparation retains its chemical and physical integrity for three months under controlled conditions, according to stability studies. In the end, the source presents this innovative dosage form as an efficient, water-free way to quickly alleviate nausea while guaranteeing excellent patient compliance due to its attractive design.[25]

ix. Formulation and evaluation of oral Palonosetron HCL medicated jelly

This study describes the development and testing of an oral medication jelly containing Palonosetron hydrochloride to treat cancer patients' nausea and vomiting. According to the study, people who are elderly or disabled and have trouble swallowing conventional pills are the target audience for this semisolid dosage. Using a variety of gelling agents, researchers tested twelve distinct formulations, evaluating them for medication consistency, viscosity, and pH balance. The results show that because of its better drug release rate and physical characteristics, the F8 batch—which used 3% gelatin—was the most successful. In the end, the authors concluded that these jellies provide an affordable and practical substitute for current drugs, guaranteeing improved patient compliance.[26]

x. Formulation and evaluation of oral sildenafil citrate medicated jelly

This study describes the development and evaluation of an oral jelly containing sildenafil citrate, which is intended to increase medication bioavailability and patient compliance. Five distinct prototypes were created by the researchers, who tested them for important characteristics such drug release rates, viscosity, and pH stability. The study emphasizes that, particularly for patients who have trouble swallowing, oral jellies offer an affordable and convenient substitute for conventional tablets. The F5 formulation, which achieved almost complete drug release in thirty minutes while maintaining high stability, was the most successful, according to the results. The source ultimately concludes that because of its better absorption and simplicity of use without water, this medicated jelly is a good substitute for traditional oral dosage forms.[27]

xi. Formulation and evaluation of oral alendronate medicated jelly

Millions of people in aging societies like Japan suffer from weakening bones and higher fracture risks due to osteoporosis, a serious health concern. Even though alendronate is a very successful medication for increasing bone density, older patients may experience gastrointestinal problems and difficulty ingesting conventional tablets. A unique oral jelly formulation was created and authorized as a safer, more practical solution to these problems. Patients with physical restrictions can simply take this unique jelly without water because it comes in an air-extruded packaging. This once-weekly jelly is bioequivalent to regular tablets and provides the same therapeutic benefits for bone health, according to clinical research. This innovation attempts to enhance treatment adherence and lower the frequency of debilitating fractures among the elderly by offering a more convenient and manageable treatment option.[28]

xii. Formulation and evaluation of oral valsartan medicated jelly

This study describes the development of a valsartan oral jelly intended to assist elderly and pediatric patients with dysphagia, or difficulty swallowing. To create a stable, semi-solid drug that works without water, the researchers experimented with various gelling agents, including xanthan gum, sodium alginate, and gelatin. The study found that the best recipe (F6) used 6% gelatin, which effectively covered up the bitter taste of the medication and guaranteed quick release in less than 30 minutes. Spectral and stability studies verified that there were no chemical interactions and that the components continued to be compatible and effective over time. In the end, the authors draw the conclusion that this novel dosage form offers a highly bioavailable, safe, and palatable substitute for conventional tablets and capsules.[29]

Comparative review of drugs used in oral medicated jelly.

S.No	Drug	Year	Polymer Used	Author
1	Ranitidine HCL	2017	Pectin	Cardoz et. al.,
2	Aceclofenac	2024	Gelatin, Xantham gum, and China grass (Agar Agar)	Mohammad Mustaq et al
3	Meclizine HCL	2023	Gelatin, Pectin, Sodium alginate	Verma et. al.,
4	Salbutamol sulphate	2018	Gelatin, pectin, methyl cellulose, Sodium carboxy methyl cellulose (Sodium CMC)	Arifa Begum et, al.,
5	Brivaracetam	2024	Gelatin, Pectin, Sodium alginate	Supriya Darandale et. al.,
6	Olmesartan medoxamil	2018	Almond gum, Gelatin	Sarojini et, al.,
7	Glibenclamide	2016	Guar gum, pectin	Kanika Nayak et. al.,
8	Domperidone	2018	Xanthum gum, Gelatin	Ruheena Taranum et, al.,
9	Palonosetron hydrochloride	2015	Carbopol 940, carrageenan	Dubey M et. al.,
10	Sildenafil citrate	2023	Sodium CMC	Panda et. al.,
11	Valsartan	2021	Xanthan gum, sodium alginate, Gelatin	Mahdil et. al.,

Scope of oral medicated jellies in the future

A novel dose type that offers many advantages over traditional oral drugs is oral medicated jellies. They improve patient adherence because they are easier to give and more pleasant, especially for elderly and pediatric patients. Moreover, their Rapid drug solubility and absorption are made possible by the special formulation, which increases bioavailability and speeds up the onset of action.

To maximize therapeutic efficacy and protect delicate medications from deterioration, oral medicated jellies can also be designed to release medications in particular gastrointestinal tract regions. Additionally, they can hold a variety of medications, like as those with stability problems or low water solubility, which makes them a desirable choice for a range of therapeutic uses. Oral medicated jellies offer a cutting-edge, creative, and approachable way to administer medications. Oral medication jellies have a great deal of potential to be used as a delivery strategy for the majority of medications in the future.

CONCLUSION

As a pharmaceutical dose form, oral medicated jellies offer numerous of benefits, such as increased patient compliance, convenience, and quick onset of action. Pediatric, elderly, and dysphagic patients are especially well suited for them. But because they are aqueous-based, proper packaging is necessary to preserve drug stability. In this comparative review, the formulation and evaluation of oral medicated jellies including Ranitidine Hydrochloride, aceclofenac, Meclizine Hydrochloride, Salbutamol sulphate, Brivaracetam, Olmesartan medoxamil, Glibenclamide, Domperidone, Palonosetron hydrochloride, Sildenafil citrate and Valsartan. Among the drug review, all formulation shows higher percentage of drug release. All things considered, oral medicated

jellies are a promising development in medication administration, providing a useful substitute for traditional dose forms.

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