Quest Journals
Quest Journals Journal of Research in Pharmaceutical Science
Volume 12 ~ Issue 3 (May- June 2026) pp: 104-111
ISSN(Online): 2347-2995
www.questjournals.org

Research Paper

"Formulation and Evaluation of Mouth Dissolving Tablets of Losartan Potassium: A Comprehensive Review"

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Abstract
Losartanpotassium,anantagonistofangiotensinIIreceptors,isextensivelyutilizedintreating hypertensionandassociatedcardiovascularconditions.Nevertheless,itstherapeuticefficacyis constrained by low oral bioavailability resulting from significant first-pass metabolism and moderatesolubilityinwater.Traditionaloraldosageformsalsoposechallenges,includingthe necessity for water during administration and difficulties in swallowing, especially among pediatric and geriatric populations.
Mouth dissolving tablets (MDTs) have been developed as a sophisticated oral drug delivery system aimed at addressing these issues by quickly disintegrating in the oral cavity without requiringwater.Thisreviewoffersathoroughexaminationoftheformulationandassessment of MDTs containing losartan potassium, focusing on enhancing bioavailability, improving patient adherence, and achieving a swift onset of action.
Thearticle exploresvariousformulationstrategies,suchasdirectcompression,freeze-drying, sublimation, and spray drying methods, as well as the significance of essential excipients like superdisintegrants, binders, and taste-masking agents. Particular emphasis is placed on both synthetic and natural superdisintegrants, which are crucial in influencing disintegration behavior and drug release profiles.
Furthermore, commonly used evaluation metrics, including pre-compression and post-compressionanalyses,disintegrationtime,andinvitrodrugrelease,arediscussed.Theresults from multiple studies suggest that MDTs of losartan potassium provide superior dissolution characteristics and greater patient acceptability compared to traditional dosage forms. In summary, MDTs represent a promising strategy for optimizing the delivery of losartan potassium and enhancing therapeutic results in the management of hypertension.

***Keywords**:*
Losartan potassium, Orodispersible tablets, Fast dissolving drug delivery system, Tablet formulation, Rapid drug release, Patient compliance

Received 06 June., 2026; Revised 15 June., 2026; Accepted 17 June., 2026 © The author(s) 2026. Published with open access at ***www.questjournals.org***

I. Introduction

Oral drug delivery continues to be the most widely accepted and preferred method of administrationduetoitsconvenience,cost-effectiveness,andhighlevelofpatientcompliance [1]. However, despite these benefits, traditional solid dosage forms like tablets and capsules are frequently linked to challenges in swallowing, especially among paediatric, geriatric, and dysphagic patients [2,3].

This issue can result in poor adherence to medication regimens and diminished therapeutic efficacy [3]. To tackle these obstacles, mouth dissolving tablets (MDTs), also referred to as orodispersible or fast disintegrating tablets, have been introduced as an innovative drug delivery system [4,5].

MDTs are engineered to disintegrate swiftly in the oral cavity, typically within seconds to a fewminutes,withoutrequiringwater[5].Thisfeaturerendersthemparticularlyadvantageous for patients who struggle with swallowing or lack immediate access to water [4].Furthermore, MDTs may improve drug absorption via the oral mucosa, thus mitigating the effects of first-pass metabolism and enhancing bioavailability [6].Losartan potassium is a non-peptide angiotensin II type 1 (AT_1) receptor antagonist that is extensively utilized in the management of hypertension, diabetic nephropathy, and cardiovascular complications [7,8].

While it is effective in reducing blood pressure, its oral bioavailability is relatively low (approximately 25–35%) due to considerable first-pass metabolism in the liver [7]. These pharmacokinetic constraints

renderlosartan potassium afitting candidate forformulation into mouth-dissolving tablets, which could potentially improve its therapeutic efficacy [9,10].

TheformulationofMDTsnecessitatestheincorporationofspecializedexcipients,particularly superdisintegrants, which promoterapid disintegration through mechanisms such as swelling, wicking, and capillary action [11,12].Both synthetic superdisintegrants (like crospovidone) and natural substances (such as banana powder and apple pectin) have been investigated for their efficacy in enhancing tablet performance [13]. Furthermore, other excipients, which include diluents, binders, lubricants, and flavoring agents, are crucial in maintaining the mechanical strength, stability, and palatability of the formulation [5].Various methods have been utilized forthe preparation of MDTs, such as direct compression, freeze-drying(lyophilization),sublimation,andspraydrying[14,15].Amongthesetechniques, direct compression is the most frequently employed method due to its simplicity, cost- effectiveness,andappropriatenessforlarge-scaleproduction[12].Theselectionofformulation method and excipients has a significant impact on essential evaluation parameters, including hardness, friability, wetting time, disintegration time, and dissolution behavior [16].

This review seeks to deliver a thorough overview of the formulation strategies and evaluation parameters pertinent to the development of mouth dissolving tablets containing losartan potassium.

LIMITATIONS OF LOSARTAN POTASSIUM

Losartan potassium is commonly utilized as an antihypertensive medication; however, it presents several pharmacokinetic and biopharmaceutical challenges that may influence its therapeutic efficacy.

One significant challenge associated with losartan potassium is its low oral bioavailability, estimated to be around 25–35%. This limitation is primarily attributed to extensive first-pass hepaticmetabolism, wherea considerable amount ofthe drugis metabolized prior to entering systemic circulation [17,18]. Consequently, only a small fraction of the administered dose becomes pharmacologically active.Anothercriticallimitationisitsshortbiologicalhalf-life, whichtypicallyrangesfrom1.5to 2 hours for the parent compound. While its active metabolite has a longer half-life, the rapid clearance of losartan necessitates frequent dosing, potentially diminishingpatient compliance [17,19].Additionally,losartanpotassiumdemonstratesmoderateaqueoussolubility,whichmayrestrict its dissolution rate and subsequently impact drug absorption within the gastrointestinal tract [20]. Poor dissolution characteristics can result in variability in drug release and inconsistent therapeutic results.Moreover, losartan experiences variable metabolism among different individuals, primarily mediated by cytochrome P450 enzymes (CYP2C9 and CYP3A4).This variability can lead to differences in drug response and efficacy among patients [19,21].Anotherchallengeisitsrelianceongastrointestinalconditionsforeffectiveabsorption.Factors suchasgastricpH,foodpresence,andgastrointestinalmotilitycanaffecttheextentandrateof drug absorption, resulting in variability in plasma drug concentrations [18].Furthermore, losartan potassium may induce certain adverse effects, including dizziness, hypotension,fatigue,andgastrointestinaldisturbances,whichcanimpactpatientadherenceto the treatment regimen [17].Given these constraints, it is essential to explore alternative drug delivery methods, including mouthdissolvingtablets,whichmayimprovebioavailability,facilitateaswiftonsetofaction, and enhance overall therapeutic efficacy.

CONCEPTOFMOUTHDISSOLVING TABLETS

Mouth dissolving tablets (MDTs), also referred to as orodispersible or fast disintegrating tablets, are solid dosage forms specifically designed to disintegrate swiftly in the oral cavity withoutrequiringwater,typicallywithinafewsecondstominutes[17,18].Theprimaryaimof MDTsistoimprovepatientconvenienceandadherencewhileensuringrapiddrugreleaseand onset of action.

In contrast to traditional tablets, MDTs are formulated with superdisintegrants and highly water-soluble excipients, which facilitate quick disintegration upon contact with saliva [19]. This mechanism allows the drug to be released in the oral cavity, where it can be partially absorbed through the buccal and sublingual mucosa or swallowed with saliva for gastrointestinal absorption [20].TheconceptofMDTsisespeciallyadvantageousforpatientswhohavedifficultyswallowing, includingpediatric,geriatric,anddysphagicindividuals.Furthermore,MDTsarebeneficialin scenarioswherewaterisnotreadilyaccessible,suchasduringtravelorinemergencysituations [17].Anothersignificant featureofMDTsis theirabilityto circumventfirst-pass metabolism, resulting in enhanced bioavailability for certain medications [21].Overall, MDTs embody a patient-focused approach to drug delivery that merges the stability of solid dosage forms with the practicality of liquid formulations.

MECHANISMOFMOUTHDISSOLVINGTABLETS

The swift disintegration of MDTs is mainly due to the function of superdisintegrants, which

promotetabletbreakdownthroughvariousmechanisms.Theprimarymechanismsinvolvedare as follows:
Swelling Mechanism: Superdisintegrantsquicklyabsorbsalivaandswell,creatinginternal pressurewithinthetabletmatrix.Thispressureresultsintheruptureofthetabletstructure, leadingtorapiddisintegration [22].

Wicking(CapillaryAction): In this mechanism, water is drawn into the tablet via capillary action, displacing the air contained in the pores. This diminishes intermolecular forces and compromises the tablet structure, causing it to fragment into smaller particles [23].

DeformationRecovery: During the compression of tablets, certain particles experience deformation. When these particlescomeintocontactwithsaliva,theyreverttotheiroriginalshape,resultinginstructural stress and the disintegration of the tablet [22].

Repulsion Forces: Particles contained within the tablet may display electrostatic repulsive forces when they are wetted, which aids in the breakdown of the tablet matrix and promotes disintegration [19].
EnzymaticAction: In certain instances, enzymes found in saliva may facilitate the breakdown of specific excipients, thus encouraging tablet disintegration [24].

COMPOSITIONOFMOUTH DISSOLVINGTABLETSOFLOSARTANPOTASSIUM

Theformulationofmouthdissolvingtablets(MDTs)containinglosartanpotassiumconsistsof a blend of the active pharmaceutical ingredient and chosen excipients that enable rapid disintegration,adequatemechanical strength, andenhancedpatient compliance.Theselection of excipients is vital in influencing the overall efficacy of the formulation.

Losartan potassium acts as the active pharmaceutical ingredient (API), primarily utilized for the treatment of hypertension. Given its moderate solubility and low bioavailability, it necessitates appropriate formulation strategies to improve its dissolution and therapeutic effectiveness [25].Superdisintegrants, including crosspovidone and croscarmellose sodium, are essential elements in MDT formulations. They facilitate rapid disintegration of tablets through mechanisms like swelling and wicking, whichin turnimproves drug release and accelerates theonset ofaction [26,27].Diluents (fillers) such as mannitol, microcrystalline cellulose, and lactose are utilized to add bulktothetabletandenhancecompressibility.MannitolisespeciallyfavoredinMDTsdueto its agreeable mouth feel and cooling effect, which increases patient acceptability [28].Binders like polyvinylpyrrolidone (PVP) or hydroxypropyl methylcellulose (HPMC) are employed to provide mechanical strength to the tablets.They ensure that the tablets maintain their integrity during handling while still permitting rapid disintegration [29].

Lubricantsandglidants,suchasmagnesiumstearateandtalc,areincludedtoenhancepowder flow and prevent adhesion during compression. These excipients play a crucial role in facilitating smooth manufacturing processes [26].Sweetening agents and flavoring agents are vital in MDT formulations to disguise the unpleasant taste of the drug and improve palatability.Common sweeteners include aspartame and saccharin sodium, while flavors like mint or orange are often utilized [30].Saliva-stimulatingagents,includingcitricacid,canbeincorporatedtoboostsalivaproduction, thus promoting quicker tablet disintegration within the oral cavity [28].Overall,theformulationofMDTsismeticulouslyoptimizedtostrikeabalancebetweenswift disintegration,sufficient mechanicalstrength,and patientacceptability,renderingthemaviable alternative to traditional oral dosage forms.

FORMULATIONTECHNIQUESFORMOUTHDISSOLVINGTABLETS(MDTS)

The formulation of mouth dissolving tablets (MDTs) encompasses various methods aimed at achievingrapiddisintegration,enhanceddissolution,andsatisfactorymechanicalstrength.The choiceofmethod is influenced by the physicochemical characteristics of thedrug, thetype of excipients used, and the desired properties of the tablet.

DirectCompressionTechnique

Directcompressionisthemoststraightforwardandcommonlyemployedmethodforproducing MDTs,owingtoitscostefficiencyandsimplicityinmanufacturing[31].Inthisapproach,the drugismixedwithsuperdisintegrants,diluents,andotherexcipients,andthencompressedinto tablets.Superdisintegrantssuchascrospovidone,croscarmellosesodium,andsodiumstarchglycolate are essential for enabling rapid tablet disintegration through mechanisms of swelling and wicking [26,32]. The effectiveness of this method relies on the careful selection of suitable excipients that exhibit good flowability and

compressibility.This approach is especially appropriate for large-scale production; nevertheless, finding a balance between mechanical strength and quick disintegration continues to pose a challenge.

Freeze-Drying(Lyophilization)Technique

Freeze-drying is an exceptionally efficient method utilized to create MDTs that disintegrate very rapidly and possess a highly porous structure [33]. In this process, the drug is either dissolvedordispersedinanaqueoussolutionthatincludesmatrix-formingagents,followedby freezing and the sublimation of water under vacuum conditions.The resulting tablets are extremely porous and disintegrate almost immediately upon contact with saliva. However, these tablets exhibit mechanical weakness and fragility, necessitating special packaging such as blister packs [34]. Furthermore, the process is costly and time-consuming, which restricts its application in large-scale manufacturing.

SublimationTechnique

In the sublimation technique, volatile compounds like camphor, menthol, or ammonium bicarbonate are integrated into the tablet formulation and subsequently eliminated through sublimation[35].Thisresultsinaporousmatrixthatenhanceswaterpenetrationandfacilitates rapid disintegration.After compression, the tablets undergo sublimation, leaving a highly porous structure. This method enhances disintegration time but may compromise tablet hardness and stability.

SprayDryingTechnique

Spray drying entails the preparation of a solution or suspension that contains the drug, polymers,andexcipients,whichisthenspray-driedtoyieldhighlyporous,fineparticles[36]. These particles are then compressed into tablets.The resulting MDTs demonstrate rapid disintegration due to their porous characteristics and increased surface area.This technique also allows for improved control over particle size and uniformity. However, it necessitates specialized equipment and meticulous optimization.

MeltGranulationMethod

Melt granulation utilizes meltable binders that become soft or liquid at relatively low temperatures[37].Thedrugiscombinedwiththesebinders,andasitcools,granulesarecreated and pressed into tablets.Thisapproachremovesthenecessityforwaterororganicsolvents,renderingitappropriatefor drugs sensitive to moisture. Additionally, it improves tablet strength while preserving satisfactory disintegration characteristics.

CottonCandyProcess(FlashDoseTechnology)

This method entails creating a floss-like structure (akin to cotton candy) from saccharides, which are subsequently milled and compressed into tablets [33]. The resulting structure is extremely porous, facilitating rapid disintegration.While this technique yields tablets with superb mouth feel and quick disintegration, it necessitates specialized equipment and specific processing conditions.

MassExtrusionTechnique

Inthistechnique,thedrugismixedwithablendofpolymersandsolventstocreateasoftmass, which is then extruded and sliced into uniform pieces [35]. These pieces are dried and compressed into tablets.This method is especially beneficial for taste masking and enhancing the palatability of bitter medications such as losartan potassium.

THEROLEOFSUPERDISINTEGRANTSINLOSARTANPOTASSIUMMDTS

Superdisintegrants are vital in the development of mouth dissolving tablets (MDTs) as they facilitate the rapid disintegration of the tablet matrix upon exposure to saliva, thus improving drug release and the speed of action [38,39]. For losartan potassium, which has moderate solubility and low bioavailability, the use of effective superdisintegrants is crucial for enhancing dissolution and therapeutic efficacy.Inthecurrentformulation,superdisintegrantslikecrospovidoneandcroscarmellosesodiumare commonly utilized due to their excellent disintegration efficiency and compatibility with various drugs [26]. These substances promote tablet disintegration through distinct yet complementary mechanisms.Crospovidone primarily functions through wicking (capillary action) and deformation recovery.Itswiftlydrawssalivaintothetabletmatrixwithoutsignificantswelling,resultingin rapid disintegration while preserving tablet integrity [40]. Thanks to its porous structure and high hydration capacity, crospovidone is particularly adept at achieving quick disintegration with minimal effect on tablet hardness.Conversely, croscarmellose sodium mainly operates through swelling and wicking mechanisms.Whenitcomesintocontactwithsaliva,itabsorbswaterandswellsconsiderably,creating internal pressure that causes the tablet structure to rupture [41]. This swelling effect greatly decreases disintegration time and

improves drug release.

The combined or individual application of these superdisintegrants can greatly affect key formulation parameters such as wetting time, disintegration time, and dissolution rate [39]. It is essential to optimize their concentration, as inadequate amounts may result in delayed disintegration,whileexcessiveamountscanweakenmechanicalstrengthandjeopardizetablet stability [42].In losartan potassium MDTs, the incorporation of crospovidone and croscarmellose sodium addresses challenges such as slow dissolution and first-pass metabolism by facilitating rapid disintegration and enhancing drug availability. Their combined effect can further improve tablet performance, rendering them excellent candidates for MDT formulations.Overall, the careful selection and optimization of superdisintegrants, especially crospovidone and croscarmellose sodium, are crucial elements in the successful creation of effective mouth dissolving tablets for losartan potassium.

ADVANTAGESOFMOUTHDISSOLVINGTABLETS(MDTS)

Mouth dissolving tablets (MDTs) present numerous benefits compared to traditional oral dosage forms, making them a compelling choice in contemporary drug delivery systems.

One of the primary benefits of MDTs is enhanced patient compliance, particularly among pediatric,geriatric,anddysphagicpatientswhofinditchallengingtoswallowstandardtablets and capsules [43,44]. The capacity of MDTs to disintegrate swiftly in the oral cavity without requiring water increases convenience and acceptability.Another significant advantage is the rapid onset of action. MDTs dissolve quickly in saliva, resulting in faster drug dissolution and absorption, which is particularly advantageous in situations that necessitate an immediate therapeutic effect [45]. In certain instances, partial absorption of the drug through the oral mucosa may take place, thus circumventing first-pass metabolism and enhancing bioavailability [21].MDTs are also beneficial for patients with limited access to water, such as travelers or individuals in emergency scenarios. Their ease of administration makes them appropriate for use at any time and in any location [43].Moreover, MDTs enhance bioavailability, especially for medications that experience considerable hepatic first-pass metabolism. The swift disintegration and potential for pre- gastric absorption lead to improved plasma drug levels [38].Anothersignificantbenefitisthediminishedriskofchokingorsuffocation,whichisfrequently linked to traditional tablets, particularly among elderly and pediatric patients [17]. This enhances the overall safety profile of the dosage form.MDTsalsoimprovepatientacceptabilityduetoabettermouthfeelandeffectivetastemasking. The addition of flavors and sweeteners can successfully conceal the unpleasant taste of medications, rendering the formulation more enjoyable [30].From a pharmaceutical standpoint, MDTs offer avenues for product differentiation and life cyclemanagement,enablingmanufacturerstocreateinnovativeformulationsofexistingdrugs [45].Ultimately, MDTs merge the benefits of both solid and liquid dosage forms, delivering the stability of solid formulations alongside the rapid action and ease of administration typical of liquids [21].

EVALUATIONPARAMETERSOFMOUTHDISSOLVINGTABLETS(MDTS)

The assessment of mouth dissolving tablets (MDTs) is crucial for ensuring their quality, efficacy, and acceptability among patients. In literature reviews, these aspects are typically examined in accordance with established protocols and pharmacopeial standards, rather than through empirical data.

Pre-CompressionParameters

Pre-compression evaluations are conducted to analyze the flow characteristics of powder mixtures prior to the compression of tablets.The angle of repose is frequently utilized to evaluate the flowability of powders. Reducedvaluessignifysuperiorflow characteristics,whicharevitalforconsistentdie filling [51].Bulk density and tapped density offer insights into the packing and compressibility behaviorofpowders.Thesefactorsareinstrumentalinpredictinghowthepowderwill perform during the compression process [52].Carr's index and Hausner ratio are commonly recognized metrics for assessing flowability and compressibility. Generally, lower values suggest favorable flow properties, which are essential for achieving uniform tablet production [53].

Post-CompressionParameters

Post-compressionparametersplayavitalroleinassessingthefinalpropertiesof tablets.

Hardness is a key factor that determines the mechanical strength of the tablets. MDTs must exhibit adequate hardness to endure handling while still permitting rapid disintegration [12].Friabilityevaluatesthetablet'sabilitytoresistabrasionandshockduringbothhandling andtransportation.Asperpharmacopeialstandards,friabilityshouldtypicallybebelow 1% [1].Weightvariationguaranteestheconsistencyoftabletweightanddosage.Itisassessed according to pharmacopeial guidelines to ensure dose uniformity [11].

WettingtimeisasignificantparameterforMDTs,asitreflectsthedurationrequiredfor saliva to infiltrate the tablet. A shorter wetting time correlates with quicker disintegration [54].Disintegration time is the most crucial parameter for MDTs. These tablets are anticipated to disintegrate swiftly in the oral cavity, generally within a few seconds to under one minute [13].Drugcontentuniformityconfirmsthateachtabletcontainsthecorrectamountofactive pharmaceutical ingredient within acceptable ranges [11].In vitro dissolution studies are conducted to assess the rate and extent of drug release. MDTs are generally expected to exhibit faster dissolution rates compared to conventional tablets [59].Thickness and diameter are measured to ensure consistency in tablet size, which is essential for packaging and patient acceptance [12].

CHALLENGESINFORMULATIONOFMDTSOFLOSARTANPOTASSIUM

Balancinghardnessanddisintegration: Achieving rapid disintegration while ensuring adequate mechanical strength poses a challenge, as tablets with high porosity are often fragile [4,22].

Tastemaskingdifficulty: Losartan potassium may possess an unpleasant flavor, necessitatingthe use of effective taste-masking strategies to enhance patient acceptability [36].

Moisturesensitivity: MDTs exhibit significant hygroscopic properties due to the presence of hydrophilic excipients, resulting in stability concerns and the requirement for specialized packaging [39].

Uniformdistributionof excipients: Achieving uniform mixing of superdisintegrants presents challenges that may influence tablet performance and consistency [22].

Scale-upandmanufacturingissues: Ensuring uniformity and quality during large-scale production can be challenging, particularly when utilizing advanced techniques [4].

LIMITATIONSOFMDTSOFLOSARTANPOTASSIUM

Notappropriateforhigh-dosemedications: Increased drug loading results in larger tablet sizes, adversely impacting mouth feel and disintegration [43].

Insufficientmechanicalstrength:MDTsexhibitgreaterfragilitycomparedtotraditionaltablets,necessitatingcarefulhandling and packaging [4].

Remaininggrittiness: Inadequate formulation may produce a gritty sensation in the mouth, diminishing patient acceptability [36].

Incompleteavoidanceoffirst-passmetabolism: While MDTs can improve absorption, a considerable amount of the drug is still ingested and subjected to hepatic metabolism [20].

Elevatedproductioncosts: Methods such as freeze-drying and spray drying require costly equipment and processing procedures [39].

II. Future Perspectives

The future of MDTs involving losartan potassium is centered on the creation of advanced, patient-focused drug delivery systems. Innovative methods, including the utilization of co- processed excipients and multifunctional superdisintegrants, are anticipated to enhance both mechanical integrity and disintegration efficiency [56].There is an increasing interest in employing natural polymers and plant-derived superdisintegrants, which present benefits such as biocompatibility, affordability, and environmentalsustainability[57].Thesesubstancesholdthepromiseofsubstitutingsynthetic excipients in forthcoming formulations.Cutting-edgetechnologieslikenanotechnology,soliddispersions,andco-amorphoussystems mayfurtherimprovethesolubilityandbioavailabilityoflosartanpotassium,therebyincreasing the efficacy of MDTs [58].Moreover, advancements in 3D printing technology are creating new opportunities for the production of personalized MDTs with accurate drug dosing and customized release profiles [59].Futureinvestigationsshouldalsoprioritizeenhancingtastemasking,stability,andlarge-scale manufacturing processes to support commercialization. The combination of innovative formulationtechniqueswithcontemporarytechnologiesisexpectedtobroadenthetherapeutic capabilities of MDTs [56].

IMPACTOFMOUTHDISSOLVINGTABLETSONBIOAVAILABILITYOFLOSARTAN POTASSIUM

Mouth dissolving tablets (MDTs) significantly influence the bioavailability of medications, especiallythoselikelosartanpotassium,whichhaveloworalbioavailabilityduetosubstantial first-pass metabolism. MDTs primarily enhance bioavailability by facilitating rapid disintegration and dissolution within the oral

cavity. When they come into contact with saliva, MDTs quickly break down into fine particles, which increases the surface area for dissolution, thereby promoting faster drug absorption [7 ,24].Furthermore, MDTs enable pre-gastric absorption of the drug via the buccal and sublingual mucosa. This absorption pathway can partially circumvent hepatic first-pass metabolism, resultinginagreaterquantityofthedrugenteringsystemiccirculation[60].Althoughlosartan potassium is mainly absorbed through the gastrointestinal tract, even a partial absorption through the oral mucosa can enhance bioavailability.Another crucial aspect is the improved dissolution rate of losartan potassium in MDT formulations. The rapid release of the drug in a dissolved or finely dispersed state mitigates dissolution-limitedabsorptionchallengestypicallyencounteredwithconventionaltablets[19].The incorporation of superdisintegrants such as crospovidone and croscarmellose sodium furtherboostsbioavailabilitybyensuringswifttabletdisintegrationandeffectivedrugrelease.
Theseexcipientsimprovethewettinganddispersionofdrugparticles,thusfacilitatingquicker absorption [24].Additionally, MDTs may help minimize the variability linked to gastrointestinal conditions, such as pH levels and gastric emptying time, by initiating drug release in the oral cavity [61].Nevertheless, it is important to recognize that MDTs may not entirely eliminate first-pass metabolism, as a considerable amount of the drug is still ingested and absorbed through the gastrointestinal tract. Consequently, the degree of bioavailability enhancement is contingent upon the drug's physicochemical properties and absorption characteristics [18].
In general, MDTs of losartan potassium can enhance bioavailability by increasing the dissolution rate, facilitating partial pre-gastric absorption, and minimizing the effects of first- pass metabolism, which ultimately leads to improved therapeutic efficacy.

III. Conclusion

Mouth dissolving tablets (MDTs) have surfaced as a promising and patient-friendly drug delivery system, presenting considerable advantages over traditional oral dosage forms.Their capacity to disintegrate swiftly in the oral cavity without requiring water enhances patient adherence, especially among pediatric, geriatric, and dysphagic populations. For losartan potassium,MDTsofferaneffectivesolutiontoaddresschallengessuchaspoorbioavailability and delayed onset of action linked to conventional formulations.The use of effective superdisintegrants, including crospovidone and croscarmellose sodium, is vital for achieving rapid disintegration and enhanced drug release. Various formulation
techniques,suchasdirectcompressionandadvancedmethods,aidinoptimizingtabletperformance.Evaluationparamet ersfurtherguaranteethequality,stability,andefficacyofthe formulation.
Despite the benefits, challenges like taste masking, moisture sensitivity, and mechanical strength must be meticulously managed.Additionally, MDTs may not entirely eliminate first- pass metabolism, which remains a limitation for specific drugs. Nevertheless, ongoing advancements in excipient technology, innovative formulation strategies, and emerging techniques such as nanotechnology and 3D printing present significant potential for further enhancement.
In summary, MDTs of losartan potassium signify a noteworthy advancement in oral drug delivery, merging convenience, rapid action, and enhanced therapeutic performance. With ongoingresearchandtechnologicalprogress,MDTsareanticipatedtoassumeanincreasingly vital role in improving patient care and treatment outcomes in the future.

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