e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:04/April-2024 Impact Factor- 7.868 www.irjmets.com

A REVIEW ON USE OF DRY POWDER INHALERS AS POTENTIAL TREATMENT FOR COVID-19 THROUGH PULMONARY DRUG DELIVERY SYSTEM

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ABSTRACT

The recent outbreak of coronavirus complaint 2019(COVID- 19) in Wuhan, China has spread fleetly around the world, leading to a wide and critical trouble to develop and use comprehensive approaches in the treatment of COVID- 19. While Oral remedy is accepted as an effective and simple system, since the primary point of infection and complaint progression Of COVID- 19 is substantially through the lungs, gobbled medicine delivery directly to the lungs may be the most applicable route In this review composition, pulmonary medicine delivery as a unique treatment option in lung conditions will be compactly Reviewed By pulmonary delivery of the presently approved medicines for COVID- 19, efficacity of the Treatment would be bettered along with reducing systemic side goods. Keywords Dry greasepaint inhalers, pulmonary medicine delivery, Novel Coronavirus, medicines as means of secondary treatment, Antiviral treatment.

I. INTRODUCTION

Emergence and rejuvenescence of viral outbreaks pose a global. Health treat which requires an critical stationing of advanced remedial options because contagious viral conditions can Elevate to the undesirable epidemic conditions. The current Coronavirus(COVID- 19) epidemic also has increased similar Interest and is driving further implicit operations of dry Greasepaint inhalation remedy in vaccines and antivirus medicines. This paper reviews the sold and in- development dry Cream inhaler(DPI) products on the treatment of systemic conditions, their status in clinical trials, as well as the implicit For COVID- 19 treatment. The advancements and unmet Problems on DPI systems are also epitomized. With innumerous attempts ahead and further challenges ahead, it's Believed that the dry cream gobbled remedy for the Treatment of systemic conditions still holds great implicit and Promise.

II. PULMONARY DRUG DELIVERY SYSTEM

Pulmonary drug delivery, compared with other routes, is a promising non-invasive strategy and may be the most appropriate Pulmonary medicine delivery, compared with other routes, is a promising non- invasive strategy and may be the most applicable treatment for cases suffering from lung conditions. The request appeal for gobbled specifics to treat lung conditions could confirm these advantages. Inhalation medicine delivery to the lungs would give rapid-fire- fire- fire action with lower side goods especially in exigency situations similar as asthma and COPD. Although pulmonary medicine delivery systems were first introduced for acute and habitual obstructive and antipathetic lung conditions, the need to locally treat pulmonary infections also bettered development of these capsule forms. For illustration, fluconazole large pervious patches for pulmonary cryptococcosis, gobbled zanamivir for influenza, gobbled ribavirin for respiratory syncytial contagion infection, and pulmonary delivery systems for antituberculosis medicines have been developed Since the symptoms of COVID- 19 are substantially presented in the respiratory system, the main targets of the contagion cycle that could be used for medicine remedy are explained and reports of pulmonary delivery of the medicines are presented.

III. DRY POWDER INHALERS

Dry Greasepaint inhalers are free- flowing powdered phrasings containing pharmacologically active medicine patches along with suitable carrier which should act locally in the upper respiratory tract or into the deep lung. Dry greasepaint inhalation remedy has been shown to be an effective system for treating respiratory conditions like asthma, Chronic Obstructive Pulmonary conditions and Cystic Fibrosis. It has also been extensively accepted and used in clinical practices. Similar success has led to great interest in gobbled remedy on treating systemic conditions in the once two decades. This is particularly effective for delivering APIs which are fluently

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metabolized through oral administration, similar as proteins, vaccines which can directly deposit in deep lungs for quick immersion into the systemic rotation.

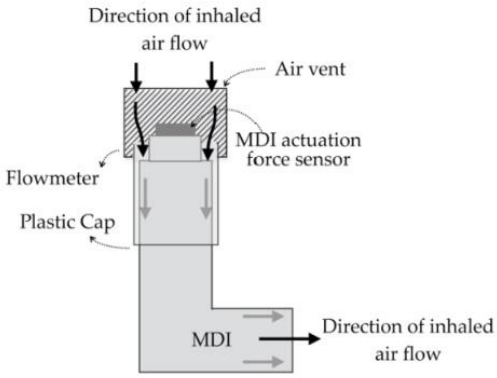

Figure 1: Dry powder inhaler

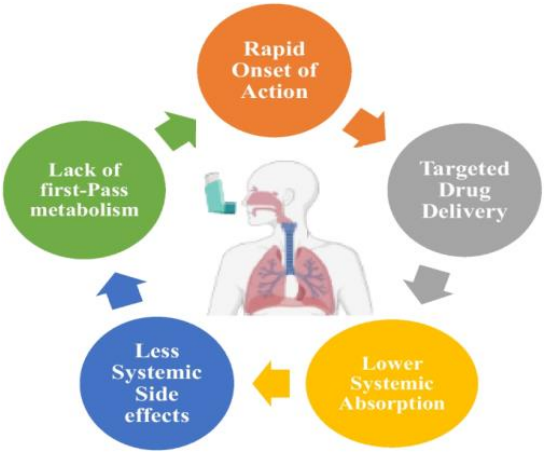

Figure 2: Name of Graph

IV. DEVELOPMENT TECHNIQUES

Development of dry greasepaint inhalers involves greasepaint Recrystallization, expression, dissipation, delivery, and Deposit of the remedial agent in different regions of the airways in prophylaxis/ treatment/ opinion of pulmonary and systemic diseases. Conventional greasepaint product by crystallization and milling has numerous limitations performing into development of indispensable ways to overcome the problems akin as following(I) incorporation of forfeitures of carrier patches to enthrall active spots on the face and use of hydrophobic carriers to greased-aggregation through reduced face energy and flyspeck commerce(ii) reducing aerodynamic compasses through flyspeck engineering and incorporating medicine into previous or low flyspeck viscosity, and/ or(iii) preparing lower cohesive and tenacious patches through corrugated shells, low bulk viscosity, reduced face energy and flyspeck commerce and hydrophobic complements.

V. EVALUATION METHODS

Aerodynamic Particle Size Distribution: Multistage Cascade impactor used to characterize the aerodynamic Particle size distribution of dry powder inhalers.

Sieve analysis: Air jet sieving technique works better For finer lactose grades. Nest of standard sieves shaken on a Sieve shaker was conventional method used to calculate Particle size distribution.

Imaging Techniques: Gamma scintigraphy, single Photon emission computed tomography, position emission Tomography techniques were used for quantification of Drug deposition from dry powder inhalers.

Delivered Dose uniformity: Dosage unit sampling Apparatus used to estimate total quantity of drug emitted From the device. In determining the quality, safety, efficacy Of dry powder inhaler delivered dose uniformity serves as a Critical quality attribute.

Moisture content: Small amounts of moisture present In dry powder inhalation powder effect the solid-state Properties and stability of powder particles. Karl Fisher Method was used to determine the moisture content of Inhalable powders.

Microbial limits: Acceptance criteria for total aerobic Count, total yeast count, mould count, freedom from Designated pathogens must be satisfied. Formulation must Not support the microbial growth and microbial quality Should retain throughout the expiration period.

Drug content: Drug content should be determined Analytically with a stability indicating method .The authors can acknowledge professor, friend or family member who help in research work in this section.

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Table 1. Drugs used in the treatment of COVID – 19

Drug Name	Formulation	Preparation technique
Niclosamide	Dry powder inhaler	Thin-film freezing
Niclosamide-lysozyme composite	Dry powder inhaler, nasalspray	Spray-drying, reconstitution
Tamibarotene	Dry powder inhaler	Spray-freezedrying
Nafamostatmesylate	Inhalable microparticles	Spray-drying
Hydroxychloroquine sulfate	Dry powder inhaler	Air jet milling
Azithromycin	Dry powder inhaler	High pressure homogenisation
Favipiravir	Dry powder inhaler	Spray drying

VI. CONCLUSION

Pulmonary delivery is considered as an effective. Remedial approach for COVID- 19, as it can insure minimal effective medicine attention in the lungs, Target point of infection, for maximum remedial exertion with the minimum cure while minimizing unfavourable goods. Fresh trouble and coffers should Be devoted to pulmonary delivery to lessen the Current utmost urgency. It will also open new Possibilities for treating unborn viral and contagious Respiratory conditions. More importantly, developing Effective pulmonary delivery of specifics will Bear determine the applicable cure and frequency Along with delivery ways. Gobbled blend dry Greasepaint could be a unique approach to treat COVID- 19 Efficiently on with precluding the implicit selection Of medicine-resistant COVID- 19 variants. Of medicine-resistant COVID- 19 variants.

VII. REFERENCE

[1] Suman Omana Soman, A. V. Raveendran, Remdesivir and Favipiravir for Covid- 19 An update, " Annals of clinical Cardiology, Vol. 2,pp. 51- 54, December 2020.

[2] Gobbled remedy for COVID- 19 Considerations of medicines, phrasings and bias, Tushar Saha, a Miguel E. Quiñones- Mateu, and Shyamal C.

[3] Stefanie Ho Yi Chan, Khalid Sheikh, Mohammed Gulrez Zariwala & Satyanarayana Somavarapu(2023) Sot greasepaint expression of azithromycin for COVID- 19 rectifiers, Journal of Microencapsulation, 404, 217- 232, DOI /02652048.2023.217592.

[4] Zhang, N. N. et al. A thermostable mRNA vaccine Against COVID– 19. Cell 182, 1271 – 1283. E1216(2020).

[5] Wang, H. et al. Development of an inactivated Vaccine seeker, BBIBP- CorV, with potent protection against SARS- CoV- 2. Cell 182, 713 – 721. E719(2020).

[6] Dai, L. et al. A universal design of betacoronavirus vaccines against COVID- 19, MERS, and SARS. Cell 182, 722 – 733. E711(2020).

[7] Knowledge and practice of dry cream inhalation among cases with habitual obstructive pulmonary complaint in a indigenous sanitarium, Nepal. Mira Adhikari Baral Int J Gen Med. 2019; 12 31 – 37. Published online 2018 Dec 24. Doi10.2147/IJGM.S165659 PMCID PMC6307686PMID 30636890.

[8] Spray- Dried Inhalable Microparticles Combining Remdesivir and Ebselen against SARS- CoV- 2 Infection Tushar Saha, Conceptualization, Methodology, Formal analysis, Data curation, Writing original draft, Writing – review & editing, 1 Shubhra Sinha, Methodology, Data curation, Rhodri Harfoot, Methodology, Data curation, Miguel E. Quiñones Mateu, Conceptualization, Methodology, Validation, Formal analysis, Writing – review & editing, and Shyamal C. Das, Conceptualization, Methodology, p confirmation, Writing – review & editing, Heidi M. Mansour, Academic Editor and Basanth Babu Edara, Academic Editor)

[9] Greasepaint Inhaler with the specialized and practical obstacles, and forthcoming platform strategies Author links open overlay panel Sachin S. Gaikwad a b, Snehal R. Pathare a, Mayur A. Further a, Nikita

A. Waykhinde a, Umesh D. Laddha b, Kishor S. Salunkhe a, Sanjay J. Kshirsagar b, Sakshi S. Patil a, Kuldeep H. Ramteke.

[10] Alkie cream expression of azithromycin for COVID- 19 cures. Stefanie Ho Yi Chan ORCID Icon, Khalid Sheikh, Mohammed Gulrez Zariwala ORCID Icon & Satyanarayana Somavarapu. Pages 217- 232| entered 30 Nov 2022, Accepted 30 Jan 2023, Published online 27 Mar 2023.

[11] J. Dattatray Patil, A. Kiran Wadkar, S. Manish Kondawar, " expression and Evaluation of Ribavirin Dry cream inhalation for pulmonary delivery by lyophilization, " Journal of Emerging Technologies and Innovative exploration, Vol. 6,pp. 234- 270, June 2019.

[12] Solid dissipations of itraconazole for inhalation with enhanced dissolution, solubility and dissipation parcels Author links open overlay panel Christophe Duret a, Nathalie Wauthoz a, Thami Sebti b, Francis Vanderbist b, Karim Amighi.