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Methods of L-Dopa Extraction by the Method of Analytical Determination for Parkinson's Neurodegenerative Disease

Mrs.E.Elavarasi[1], YuvarajAr[2], J.Jayadurka[3], Puniparthisunitha[4], K.Pooja[4], K.divya[5], S.Harinishree[5], Vanitha Sri.T[6], Madhumitha K[7]

[1,2,3,4,5,6,7]Faculty Of Pharmacy, Bharath Institute Of Higher Education And Research, Chennai,India

ABSTRACT

Levodopa the majority of Parkinson's disease patients eventually require levodopa medication. The chemical dopamine, which is produced when levodopa is absorbed by brain nerve cells, is used for send messages from brain regions,neurons,and synaptic memberane. that regulate movement.this neurodegenerative disease can cause uncontrollable movements, shivering, and problem balancing and muscle control. Only a few plants in the Fabaceae family have substantial amounts of isolated L-dopa; the rest are either chemically synthesized or derived from natural sources.(HPLC) added with mass spectrometry else it can added with UV-visible detection. Most frequently, HPLC is utilized.

KEYWORDS: levodopa,Parkinson'sdisease,HPLC, neurological condition

ARTICLE DETAILS

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INTRODUCTION:

The progressive worsening of symptoms is a result of a portion of the brain gradually degenerating in Parkinson's disease. This disorder can have a large number of many effects on your senses, cognitive abilility, mind problem, and more, even though it is most well-known for its effects on muscle control, balance, and movement.Among age-related neuro brain diseases, Parkinson's disease ranks second in prevalence overall. It's also the most prevalent brain disease pertaining to motor function. According to experts, at least 1% of adults over 60 are affected globally

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BACKGROUND OF LEVODOPA

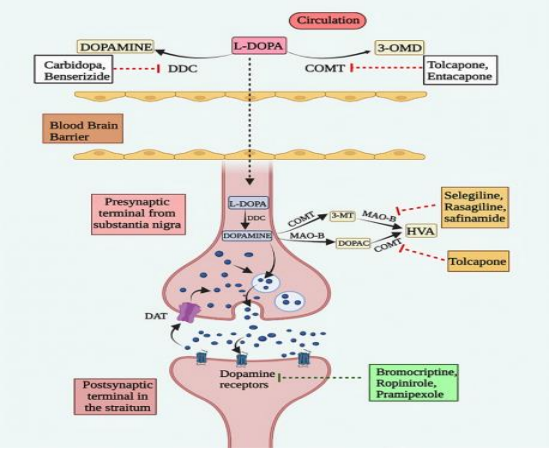
Because levodopa can be produced for both side dopamine the blood-brain barrier, it is typically given with carbidopa drug composition, a dopa decarboxylase inhibitor, to delay anabolism until after the barrier has been crossed. Levodopa is converted to dopamine once it crosses the neuro blood-brain barrier, which is then used to augment the body's low levels of dopamine to treat Parkinson's symptoms. On May 2, 1975, the FDA approved Sinemet, a combination levodopa and carbidopa medication. This was the first developed drug product to receive FDA approval.Levodopa is a dopamine can herald that is used to treat parkinsonism-using disorders such as for this disease and other conditions. It is routinely used in co occurance with carbidopa.

PHARMACODYNAMICS

Dopamine not only levodopa can pass from the BBB. To count the amount of levodopa that crosses the blood-brain barrier,it can inhibit the dopa decarboxylase for inhibitor stops levodopa from converted to dopamine for the system of peripheral. After levodopa crosses the blood-brain barrier, aromatic-L-amino-acid and other decarboxylase enzyme converts it to dopaminefor mechanism

MECHANISM OF ACTION

Levodopa drug enter the blood system and cross to the brain, it is removal of carbon for presynaptic terminals of dopamine contain neuron can bringout dopamine. Following release, it can inculcation by monoamine oxidase enzyme(MAO) or moved back into the dopaminergic terminals by catechol-O-methyltransferase enzyme (COMT).Levodopa enters the brain and aids in the replacement of dopamine that is lost, improving cognitive function. Levodopa helps manage symptoms by boosting dopamine levels in the brain.



LEVODOPA EXTRACTION TECHNIQUES

Method for obtaining LD nowadays is extraction from natural products rather than chemical reaction, which is time taking, costly, and produces a racemic mixture of LD. The creating an produces protocol that guarantees maximum LD of recoveries, eliminates interfering endogenous compounds, and is simple, fast, and affordable is justified by this.

LIQUID –SOLID EXTRACTION

The popular extraction method is liquid-solid extraction (LSE). The extraction process begins with the separation of the liquid sample into the solid of sample. Then, the analytes dissolve into the solution, diffuse out of the solid sample, and are eventually collected. Considerations include the temperature, the extraction time, the solvent-solid ratio, the crystal particle size analysi, the solvent's physical-chemical characteristics, and others. All liquid-solid extraction techniques, as previously mentioned, involve pre-treating the finely ground solid sample and, in certain cases, necessitating the solid and extracting solution to be homogenized.

ULTRA SOUND- ASSISTED SOLVENT EXTRACTION

Waves of the ultra sonic that cause in the liquid stablemedium and permit the distribution the sample of the cells are the basis for ultrasound-assisted extraction, or UAE. This technique enhances the mass transfer of the analyte into the solution and its dissolution.These findings could be explained by the possibility that ultrasonics lead to overheating, which accelerates LD's thermal degradation. Thus, it's best to cut down on the amount of time spent sonicating, or at the very least, take steps to prevent overheating, like moving water around in the ultrasonic bath.

EXTRACTION BY REFLUX METHOD

Reflux liquild extraction is a popular solid combines liquid extraction method that produces on rotating cycles of solvent condensed and evaporation and alyhough condensed in over a predetermined time of taken much. It occurs at a constant temperature. Effective, straightforward, affordable, and widely used in the industrial sector is this process. Few studies have used a reflux extraction protocol with a 25 °C extraction temperature. It is important to take note of the lengthy extraction period used, as it is a drawback of this method (extraction times typically vary from 30 to 300 minutes, plus larger solvent volumes are required in comparison of other methods

LEVODOPA DETECTION METHODS BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

The most popular analytical technique for identifying LD in plant matrices is detection of diode (DAD) at the 280 nanometer in conjunction with HPLC analytical technique. While it can sensitivity of HPLC-UV is limited, it usually requires a higher concentration of analyticalin the sample than liquid chromatography and mass spectrometry. In contrast to LC and mass spectrometry, whichis gives distinct and further identifying, HPLC-UV selectivity is lower because similar molecules may also attract the original value of wavelenght.In this instance, using standards and comparing retention times is more beneficial to verify the identity of the compounds and validate the separation process than relying solely on UV absorption spectrum analysis.removal of the type of negativity, HPLC and UV is still the best of performed method because for the reason less expensive than LC-MS, more robust, efficient, fast (in above types suggested, the high of graph be seen up to 10 minutes into the chromatography), more reliable, also more sensitive than UV-visible spectrophotometry.

HGH PERFORMANCE THIN LAYER CHROMATOGRAPHY(HPTLC)

In quantitative analysis,HPTLC is straightforward, reliable, quick, and effective analytical method. Compared to TLC, HPTLC provides a better separation, and bidimensional HPTLC can enhance the separation even more. In order to ascertain the presence of LD in extracts from M. macrocarpa beans, Aware et al. employed HPTLC. Better resolution and a more visible result are provided by HPTLC, but this technique should only be used as a first step; quantitative analysis still requires a complementary method

ELECTROCHEMICAL METHODS

Since electrochemical methods have many advantages over such as quick answer times, low apparatus requirements, affordability, high susceptibility, and also selectivityalthough sample preliminary treatment they are highly sought after bio compounds of analyzing methods. By significantly enhancing response selectivity, the addition of nanomaterials to conventional electrodes, such as carbon nanotubes, graphene oxide, and metal nanoparticles, allows for the achievement of high precision, accuracy, and confirm the nano level

CONCLUSION

The compound of interest is extracted quantitatively through LD determination. Effective extraction techniques can enhance the application of synthetic nature production containing more concentrations for the functionalized material degenerative Parkinson's disorder.all above can techniques are the mostly can using, although the alternative procedures can invited to produce some comlicated concerning matrices of selective extracting of solutions, time and temperature values. Extraction efficiency typically increases by applying more acidic extraction to the 0conditions. Chromatographic following separations are based to on a primary separation of step also show the limited of selectivity in complex material pf product. In our future generation, the objective of multi dimension technology could consider as a reduce of the matrix on the effects and procedure and this importantly developed the analytical objectives and solutions Regarding observing of techniques, the method of confirm choice for the medium and high of content and the matrices for its high diffusion and flexibility

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