DEVELOPMENT OF A TABLET FORMULATION FOR THE TREATMENT OF EDEMA SYNDROME

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Introduction. Edema syndrome is a common condition associated with fluid retention, often arising from heart failure, kidney dysfunction, or other systemic diseases. Diuretic therapy plays a crucial role in managing edema by promoting the excretion of excess fluid from the body. In traditional and herbal medicine, horsetail extracts (Equisetum arvense) and orthosiphon (Orthosiphon stamineus) have long been used for their diuretic properties. These plant extracts are believed to help reduce swelling and alleviate fluid retention without the harsh side effects often associated with synthetic diuretics. In addition to their diuretic effects, these herbs are known to have antioxidant properties, further supporting their use in chronic conditions like heart failure. This study focuses on developing a tablet formulation containing these herbal extracts to treat edema syndrome, particularly in cases related to heart failure. The introduction of a tablet form aims to improve patient compliance compared to liquid herbal preparations, making the treatment more convenient for everyday use.

The aim of the study. The main objective of this research is to develop an effective and stable tablet formulation using horsetail and orthosiphon extracts to treat edema. The study aims to evaluate the diuretic properties of the herbal extracts in tablet form, ensuring that the formulation promotes fluid elimination without causing electrolyte imbalance or other adverse effects. Additionally, the research seeks to optimize the composition of the tablets by incorporating excipients that enhance tablet stability, disintegration, and patient acceptability. Special attention will be given to ensuring that the herbal extracts maintain their bioactivity during manufacturing, as high processing temperatures and compression forces may degrade some active compounds.

The formulation also aims to ensure consistent dosing of the active herbal ingredients, providing a reliable therapeutic effect with minimal variability between batches. The excipients selected for this formulation include potato starch, microcrystalline cellulose (MCC), sodium glycolate, aerosil, and calcium stearate, which play a key role in maintaining the physical properties of the tablets.

Methods of research. The excipients used - potato starch as a filler, microcrystalline cellulose (MCC) as a binder, sodium glycolate as a disintegrant, aerosil as a flow regulator, and calcium stearate as a lubricant - were incorporated into the formulation to ensure uniformity, ease of manufacturing, and appropriate disintegration time. Technological tests were performed to evaluate tablet hardness, friability, disintegration time, and dissolution profile. These tests were essential in determining the ideal ratio of active ingredients to excipients, ensuring the tablet's effectiveness and patient acceptability. Stability testing was also carried out, with tablets stored under various conditions to assess their durability and shelf life.

Main results. The formulation developed a stable tablet that met the desired physical and chemical properties. Using potato starch and MCC ensured good tablet compressibility, while sodium glycolate significantly improved the disintegration time, allowing the tablets to dissolve rapidly in under 15 minutes. The fast disintegration ensures that the active ingredients are released quickly into the body, maximizing therapeutic effects. The aerosil and calcium stearate used in the formulation helped improve the flow properties and prevent sticking during tablet manufacturing, which is critical for large-scale production. Stability testing confirmed that the tablets maintained their integrity and potency over an extended period, making them suitable for commercial use.

Conclusions. Natural diuretics offer a gentler alternative to synthetic diuretics, reducing the risk of adverse effects while still providing therapeutic efficacy. The development of a tablet formulation containing horsetail and orthosiphon extracts for treating edema syndrome has shown promising results. The tablets demonstrated rapid disintegration and stability, making them a viable option for managing fluid retention, particularly in patients with heart failure. This formulation presents a natural, safe, and patient-friendly approach to treating edema, potentially improving the quality of life for individuals suffering from fluid retention and related conditions.