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Application of montmorillonite powder in the treatment of acute small intestinal bleeding

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Abstract. This paper discusses the application of montmorillonite powder in the treatment of acute small intestinal bleeding. This paper combines the research results at home and abroad to systematically discusses the mechanism, clinical effect, adverse effects and precautions of montmorillonite powder in the treatment of acute small intestinal bleeding. Combined with the domestic and foreign research methods, the domestic research emphasizes its deep research in pharmacology, clinical application and basic research, providing support for its wide application in the domestic medical field. Foreign studies have highlighted that montmorillonite powder not only has unique advantages in the treatment of acute small intestinal bleeding by regulating the balance of intestinal flora and enhancing immunity, but also provides a new therapeutic idea for its combined application with other drugs. Domestic and foreign research progress shows that montmorillonite powder has achieved some efficacy in the treatment of acute small intestinal bleeding, however, despite the significant progress, its mechanism of action and application method still need to be further studied. In the future, multidisciplinary cooperation should be strengthened to develop safer and more effective treatment options through in-depth research to provide more comprehensive medical services for patients with acute small bowel bleeding.

Keywords: montmorillonite powder; acute small intestinal bleeding; mechanism of action; clinical application effect; international research progress

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1. Foreword

Acute small bowel bleeding refers to an emergency caused by mucosal injury or ulcer of the small intestine, once known as "unexplained bleeding (OGIB)", which accounts for a small proportion of gastrointestinal bleeding clinically. However, this kind of disease not only is life-threatening, but also has a serious impact on the quality of life of patients [1]. In this emergency situation, montmorillonite powder as a widely used gastrointestinal hemostasis drug, because of its good efficacy and safety of the attention [2]. Montmorillonite powder is a natural silicate drug, mainly composed of montmorillonite. Its excellent adsorption performance enables it to effectively absorb the bacteria, toxins and harmful substances in the intestinal tract, so as to reduce the stimulation and damage to the intestinal tract [3]. In addition, montmorillonite also has adhesive and gelation properties, forming a protective membrane in the intestine, which helps to prevent further mucosal damage and bleeding [4]. Therefore, this paper aims to deeply explore the mechanism, clinical application effects and possible adverse reactions of montmorillonite powder in the treatment of acute small intestinal bleeding, so as to provide a more comprehensive reference basis for clinical practice. Through the thorough study of montmorillonite powder, we hope to develop more effective and safe strategies for the treatment of acute small intestinal bleeding to improve the treatment success rate and quality of life of patients.

2. Mechanism of action of montmorillonite powder

Montmorillonite powder, with its main component montmorillonite, is widely used in the treatment of gastrointestinal bleeding, and its unique mechanism of action makes it perform well in digestive system diseases [2]. Montmorillonite has excellent adsorption performance, its molecular structure is layered silicate, so that it can efficiently absorb bacteria, toxins and other harmful substances in the intestinal tract, and quickly reduce the stimulation and damage to the intestinal tract[5]. Moreover, the unique adhesive and gelation properties of montmorillonite enable it to form a protective membrane in the intestine [6], This protective membrane not only helps to prevent further mucosal damage, but also can effectively inhibit the occurrence of bleeding. Therefore, montmorillonite powder in the treatment of acute small intestinal bleeding through multiple mechanisms such as adsorption, adhesion and gelation [7], Show a powerful hemostasis effect. This unique mechanism of action not only makes montmorillonite powder highly respected in its clinical application, but also provides rich research directions for the in-depth study of its therapeutic mechanism. With a deeper understanding of the molecular level mechanism of montmorillonite powder, we may be able to develop more accurate and efficient treatment options to bring better treatment experience and prognostic effects for patients with acute small intestinal bleeding.

3. Clinical application effect of montmorillonite powder

3.1. Efficacy evaluation index

Montmorillonite powder has shown good efficacy in the treatment of acute small intestinal bleeding, and has been widely recognized. According to the results of relevant studies at home and abroad, the effective rate of montmorillonite powder in the treatment of acute small bowel bleeding is higher, reaching 80% to 95% [8]. This high response rate demonstrates the unique advantages of montmorillonite powder in hemostasis, bringing a significant clinical benefit to patients. Besides its

remarkable efficacy, MST has fewer adverse effects [9]. No significant drug side effects or toxic effects were found in clinical trials and practical applications [10]. This makes it a relatively safe drug option, especially suitable for patients who have allergy or intolerance to other hemostatic agents. In addition, montmorillonite powder can also shorten the hospital stay and recovery period, and reduce the pain and burden of patients [11]. Due to their rapid hemostasis and safety, patients are often able to return to normal life and work faster, reducing complications and hospital stay, and improving the quality of life [12]. Therefore, montmorillonite powder is not only an effective gastrointestinal hemostasis agent, but also a beneficial treatment regimen for patients. In conclusion, montmorillonite powder showed a relatively high response efficiency, less adverse effects, and a shorter hospital stay and recovery period in the treatment of acute small bowel bleeding [13]. These advantages make montmorillonite powder a widely used and trusted gastrointestinal hemostasis drug, providing an important treatment option for the treatment of acute small intestinal bleeding.

3.2. Scope of indications

Montmorillonite powder is a commonly used gastrointestinal hemostatic drug, which is suitable for gastrointestinal bleeding caused by various causes. It can be used to treat bleeding diseases such as gastroduodenal ulcers, gastrointestinal tumors and inflammatory bowel diseases [14]. Through adsorption, adhesion and gelation, it forms a protective membrane in the intestinal tract, reduces stimulation and damage, and promotes mucosal repair and regeneration, so as to achieve the effect of hemostasis [15]. However, more active and effective measures should be taken to treat severe cases of massive bleeding. For example, endoscopic hemostasis, vascular intervention, or surgical procedures may be the more suitable options [16][17]. These methods can directly address the bleeding source or repair the ruptured vessels to control the bleeding and save the patient's life. Therefore, when using montmorillonite powder for acute small bowel bleeding, doctors should evaluate and judge according to the specific situation of the patient, and determine the most appropriate treatment plan [18]. For cases of major bleeding, timely referral to a specialist hospital for further management is crucial. At the same time, patients should also follow the doctor's advice and actively cooperate with the treatment to obtain the best treatment effect.

3.3. Use method and dose

The use method and dose of montmorillonite powder are related to the realization of the treatment effect. Therefore, a special attention is needed to strictly follow the medical advice in the application process to ensure safe and effective treatment. Typically, montmorillonite powder is presented as oral dose at 3 to 6 g three times a day [19]. This rationally allocated dose is designed to ensure that patients obtain adequate efficacy during treatment while avoiding excess triggering potential adverse effects. Doctors will tailor their prescriptions according to the specific condition, weight and age to ensure that the use of drugs is more in line with the actual situation of patients [20]. It is worth noting that when using montmorillonite powder, you should stick to the doctor's advice, do not use excessive use or long-term use, so as to avoid potential drug abuse problems. Especially for those patients who need long-term maintenance treatment, doctors should conduct regular monitoring and dynamically adjust the medication regimen according to the progress of the disease to ensure the long-term effectiveness of the treatment [21]. Moreover, the interaction of montmorillonite powder with other drugs is also an

important aspect of attention. During treatment, the patient should report to the doctor on other medications being used, including prescription drugs, over-the-counter drugs, and supplements. This helps doctors to fully understand the patient's medication situation, avoid unnecessary drug interactions, and ensure the maximum efficacy [22]. In conclusion, scientific and reasonable use methods and dosage are important guarantees for montmorillonite powder in the treatment of acute small intestinal bleeding. Under the guidance of doctors, patients will cope with the treatment process with more confidence and security, laying a solid foundation for the final recovery and health [23].

4. Adverse reactions and precautions

4.1. Adverse reactions

Montmorillonite powder may have some mild adverse reactions, such as nausea, vomiting, diarrhea, etc[19]. But these responses are generally transient and do not affect the treatment effect [24]. If you have a severe allergic reaction or other uncomfortable symptoms, please seek medical attention immediately.

4.2. Note

The following points should be paid attention to when using montmorillonite powder [25]: (1) Use drugs by medical advice; (2) do not use in excess or long-term; (3) pay attention to the interaction with other drugs; (4) pregnant women, lactating women and children should be used under the guidance of doctors; (5) reduce the dose or extend the administration interval for patients with renal insufficiency.

5. Progress in clinical research

5.1. Domestic research progress.

Some progress has been made in the domestic treatment of montmorillonite powder for acute small intestinal bleeding. These studies have mainly focused on pharmacology, clinical application and basic research, providing an important scientific basis for the application of this drug. In pharmacology, domestic studies have found that montmorillonite powder has the potential to alleviate intestinal inflammatory responses [26]. By reducing the damage degree of intestinal mucosa, montmorillonite powder helps to improve intestinal barrier function and promote intestinal mucosal repair and regeneration [27]. These findings provide a theoretical basis for the efficacy of montmorillonite powder as a digestive tract hemostasis agent. In terms of clinical application research, domestic studies show that montmorillonite powder has certain efficacy in the treatment of acute small intestinal bleeding, and has few adverse reactions [28]. These studies used a multicenter, randomized controlled approach and included patients with different case types. The results showed that montmorillonite powder can significantly reduce blood loss, shorten hospital stay, and does not increase the incidence of other complications [29]. These results further confirm the potential of MST as a safe and effective digestive hemoagent. In terms of basic research, the domestic scientific research team mainly discussed the action mechanism and application prospect of montmorillonite powder from the perspective of molecular biology and cytology [30]. By analyzing the interaction between montmorillonite powder and intestinal mucosal cells, they gained insight into the regulatory mechanism of mucosal barrier function. Moreover, basic studies have explored the anti-tumor effects

of montmorillonite powder [31], ABA [32] and immune regulation [33]. Such potential, which provides important theoretical support for the further development and application of this drug.

5.2. Progress in foreign research.

Foreign research on the treatment of acute small intestinal bleeding has shown a rich and colorful development landscape, which not only enriches our understanding of its curative effect, but also provides more innovative ideas for clinical treatment. A series of studies have revealed the excellent performance of montmorillonite powder in regulating the balance of intestinal microbiota. By promoting the growth of beneficial bacteria, and inhibiting the reproduction of harmful bacteria [34], Montmorillonite powder showed a potential microecological regulation mechanism in the process of preventing acute small intestinal bleeding. This finding deepens our understanding of the mechanism of action of montmorillonite dispersion, and provides a reference for the design of more accurate microecological conditioning strategies in the future. The study highlights the unique value of montmorillonite powder in enhancing intestinal immunity. By activating the immune response pathway and improving the mucosal barrier function, montmorillonite powder not only plays a direct role in the treatment of acute small intestinal bleeding, but also provides more comprehensive support for the body to fight against external insults by improving the overall ability of the host's immune system [35]. Research on the joint application of montmorillonite powder and other drugs has been conducted extensively. This combinatorial treatment strategy may reduce the potential risks raised by a single agent while improving treatment efficacy. This provides doctors with more options when formulating treatment plans, and is expected to open up a new situation for realizing more personalized and comprehensive treatment plans. Therefore, the in-depth development of foreign research not only promotes the global application of montmorillonite powder, but also provides a more diversified and innovative path for the treatment of acute small intestinal bleeding. The continuous expansion of this field will inject new vitality into the future of medical research and clinical practice.

6. Conclusion and Outlook

In conclusion, as a natural drug, montmorillonite powder has achieved certain efficacy and shown good application prospects in the treatment of acute small intestinal bleeding. However, there are still some shortcomings in the research of the mechanism of action and application methods, which need to further strengthen the research work of interdisciplinary cooperation. Future studies could focus on in-depth exploration of the mechanism of montmorillonite powder, including its regulation of the intestinal mucosal barrier, the reduction of inflammatory responses, and the promotion of intestinal mucosal repair and regeneration [36]. Meanwhile, safer and more effective treatment options also need to be explored to improve the treatment efficacy of acute small bowel bleeding and the quality of life of patients. It is believed that through continuous research and innovation, montmorillonite powder is expected to become one of the important means in the treatment of acute small intestinal bleeding, providing better medical options for patients.

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