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Role of Oral Ranitidine in Children Having Molluscum Contagiosum

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ABSTRACT
Molluscum contagiosum is a common viral skin infection in children, often treated through invasive methods such as cryotherapy or curettage, which can be painful and lead to scarring. This study investigates the efficacy of oral ranitidine, with immunomodulatory properties, as a non-invasive treatment option for pediatric patients with molluscum contagiosum. To assess the effectiveness of oral ranitidine in reducing lesion size and promoting lesion clearance in children diagnosed with molluscum contagiosum over an 8-week treatment period. A cohort of pediatric patients, aged <18 years, received oral ranitidine daily for 8 weeks. The number, size and distribution of lesions were recorded at 2-week intervals. Treatment outcomes were categorized as full resolution, partial reduction, or no improvement. Most patients demonstrated significant lesion reduction, with 60% achieving full resolution by week 8. Younger patients showed quicker improvement, with visible changes noted as early as week 4. However, two patients showed no response to treatment. The treatment was well-tolerated, with no reported side effects or complications. Oral ranitidine appears to be a safe, effective and non-invasive alternative for treating molluscum contagiosum in children, offering a less distressing option compared to traditional therapies. Further studies with larger sample sizes and long-term follow-ups are needed to confirm its efficacy and explore its potential as a standard treatment.

INTRODUCTION

The Molluscum contagiosum virus (MCV) is a cutaneous condition that affects infants and is caused by the Poxvirus family. This disease may be accompanied by several little bumps, some of which will be fleshor white-coloured and will have indentation cores. There are a lot of parents who place a high premium on having their children checked out because they don't want their children to experience poor self-esteem, social isolation, or the spread of the illness[1]. Even though most diseases that affect children are entirely harmless and go away on their own, parents nevertheless take their sick children to the physicians. There is also an effect that molluscum contagiosum has on one's mental and social well-being[2]. The molluscum contagiosumtreatment program includes several procedures, including curettage, potassium hydroxide, trichloroacetic acid and cryotherapy. Treatments such as cryotherapy and curettage are additional techniques. These therapies can cause various adverse effects, including inflammation, pigmentation problems, scarring and the recurrence of lesions. As a result of these adverse effects, the therapy becomes more difficult for young children, particularly when lesions are given to sensitive parts such as the face. Scarring is an increased danger that is associated with these side effects. This becomes more obvious when the disease is put to the face throughout the treatment process. When there are facial lesions, this characteristic becomes very evident[2]. Consequently, individuals are seeking alternative therapies that are less intrusive, more pleasurable and successful in alleviating symptoms without making them worse. The oral immunomodulatory drugs cimetidine and ranitidine, used to treat acid-related illnesses, are gaining more attention from the public. Cimetidine and ranitidine are two oral immunomodulatory medications that are starting to get some public notice for their use in treating acid-related illnesses. The immune-boosting properties of these medications give them hope for treating viral infections that cause anaemia. These drugs can cure viral diseases such as anaemia by strengthening the immune system[3].

Immunomodulatory treatment is a new area of study that has the potential to cure viral illnesses like Molluscum contagiosum. Certain medications, especially those that enhance T-cell-mediated immunity, have the potential to fortify the immune system. Among these drugs are those that lower gastric acid production. This essential phase is also required for the immune system to defend against viral infections effectively[1]. Cimetidine has been attempted and evaluated for many skin problems, including verruca plana and molluscum contagiosum. However, there is no definitive data that Cimetidine effectively treats these conditions. As a result of the effects that ranitidine has on the immune system, researchers are considering it as a possible non-invasive treatment for molluscum contagiosum in children[4]. The study investigates the use of oral ranitidine as a treatment for children with molluscum contagiosum, aiming to offer a safer, less invasive alternative to conventional therapies. The research evaluates the immuno modulatory effects of ranitidine, aiming to improve treatment outcomes, reduce recurrence rates and enhance patient comfort. The goal is to improve disease management and overall quality of life for affected children.

Aim of the Study: To assess ed the effectiveness and safety of oral ranitidine as a non-invasive treatment for molluscum contagiosum in children, focusing on improving patient outcomes and reducing side effects associated with traditional therapies.

Objectives: To evaluate the immunomodulatory effects of oral ranitidine in promoting lesion clearance and minimizing recurrence in pediatric patients with molluscum contagiosum.

MATERIALS AND METHODS

This multicentre longitudinal study was conducted in Saraswati Institute of Medical College Hapur UP , India involving 24 children with MC were screened. Participants meeting the criteria were treated with oral ranitidine syrup for 8 weeks, with follow-up every 15 days and no adjunctive therapy.

Inclusion Criteria: The study involved participants who had been diagnosed with molluscum contagiosum (MC) and were under 18 years of age. Written informed consent was obtained from parents or guardians prior to enrolment. Additionally, participants were required to have had no prior contraindications to oral ranitidine treatment, ensuring that the therapeutic approach could be safely administered throughout the study period.

Exclusion Criteria: The following criteria were used to exclude patients from the study:

- Children with underlying systemic diseases.
- Children with malnutrition.
- Children receiving other treatments for MC or those using adjunctive therapies.
- Children with conditions that could interfere with the evaluation of MC lesions (e.g., severe skin disorders).

Data Collection: Molluscum contagiosum (MC) was the condition most frequently observed in children. To encourage willing participation in the research and allow for photographs to be taken, parents or guardians were required to provide written informed

consent. Important details, including the patient's gender, age at the onset of the disease, duration of illness, risk factors and previous treatments, were meticulously documented in the medical history. Clinical examinations were performed to record the distribution, number and average size of the lesions, along with any accompanying features such as inflammation or eczematisation. Additionally, a thorough physical examination was conducted by a physician to rule out any serious health issues. Individuals with systemic illnesses or severe malnutrition were excluded to ensure a more accurate assessment of the treatment's efficacy. Over an eight-week period, the selected patients received oral treatment with ranitidine syrup at a dosage of 5 mg/kg/day, divided into two doses. Following this, patients were scheduled for follow-up appointments every fifteen days to monitor whether the lesions were increasing or decreasing in number.

Data Analysis: A descriptive analysis was conducted on the dataset, which encompassed both demographic information (such as age and gender) and clinical details (such as the onset date of the disease and its duration). Variability was observed in the number and sizes of the lesions at the beginning of the trial. The primary outcome measured was the difference in the number and size of lesions recorded at the start of treatment compared to those noted during follow-up visits. A decrease in either the size or number of lesions, or their complete resolution, was classified as an improvement.

RESULTS AND DISCUSSIONS

At the study's onset, the number of lesions varied considerably among patients. Most exhibited moderate to high lesion counts, with a range from 5 to 40 lesions. (Table 1) presented the clinical profiles of 24 patients diagnosed with molluscum contagiosum, tracking the progression of lesion counts over an 8-week period. The cohort included 13 males and 11 females, with age<18 years. Lesion counts were recorded at start of treatment, as well as at the 2nd, 4th, 6th and 8th weeks. There were instances where patients were lost to follow-up, as indicated in the respective columns. By the 2nd week, many patients showed a noticeable reduction in lesions. For example, patient 1 (9 years old, male) experienced a decrease from 24 to 6 lesions. Other patients, such as patient 10 (7 years old, female) and patient 15 (10 years old, male), demonstrated moderate reductions, dropping from 17-16 and 23-19 lesions, respectively. However, the follow ups of five patients were not completed during this period. By the 4th week, most patients exhibited a significant reduction in lesion counts, with some having only a few lesions remaining. For instance, patient 2 (12 years old, male) decreased from 21 lesions initially to 12 by the 4th week. Patient 6 (5 years old, female) and patient 7 (2 years old, male) experienced even greater reductions, with lesion counts falling from 15-8 and 32-15, respectively. Follow ups of two more patients were also not completed during this time. Continued improvements were noted by the 6th week, as lesion counts dropped to single digits or were eliminated in many cases. For example, patient 8 (6 years old, male) saw a decrease from 40 lesions to 10, while patient 21 (5 years old, male) was left with only 4 lesions from an initial count of 11. A few patients, such as patient 12 (6 years old, male) and patient 10 (7 years old, female), showed a slower reduction, with some residual lesions noted but significantly decreased in size. By the 8th week, most patients were either lesion-free or had significantly reduced lesions. Patients such as patient 1 (9 years old, male), patient 6 (5 years old, female) and patient 9 (9 years old, female) were completely lesion-free. Other patients, like patient 12 (6 years old, male), still had a few remaining lesions, though these had considerably decreased in size. Overall, only 4 patients continued to show any lesions by the end of the study and the remaining lesions had generally reduced in size.

(Table 1) demonstrated that most patients experienced significant improvement by the 8th week, with many becoming lesion-free by this time. However, some patients showed a slower rate of improvement or there follow ups were not completed during the study, highlighting the importance of consistent monitoring in the treatment of molluscum contagiosum. This clinical data suggests that with adequate care and follow-up, molluscum contagiosum lesions can be successfully reduced or eradicated in pediatric patients.

(Table 2) presented the clinical responses of 24 patients diagnosed with molluscum contagiosum over an 8-week treatment period. The data reveals a diverse range of outcomes based on individual responses to the treatment administered.

Complete elimination of lesions in 2 weeks was not observed in any of the patients, indicating that the treatment did not yield immediate results within the first two weeks. This lack of early resolution may suggest that the lesions were resistant to the initial therapeutic approach or that the chosen treatment required more time to become effective. By the 4th week, two patients achieved complete elimination of lesions. This finding reflects a delayed response to the treatment, indicating that while some patients may take longer to respond, the treatment can still be effective. Notably, these two patients exhibited significant reductions in their lesion counts during the preceding weeks, paving the way for eventual resolution. As the treatment continued, the 6th week showed improved results, with five patients achieving complete clearance of their lesions. This indicates a positive trend in treatment efficacy as more patients

Table 1: Clinical Profile of Patients with Molluscum Contagiosum and Lesion Progression Over 8 Weeks

n	Age (years)	Sex	Lesions count at beginning	Lesions count at 2nd week	Lesions count at 4th week	Lesions count at 6th week	Lesions count at 8th week
1	9	Male	24	6	0	0	0
2	12	Male	23	21	follow-up not completed	follow-up not completed	follow-up not completed
3	7	Male	15	14	follow-up not completed	follow-up not completed	follow-up not completed
4	5	Male	20	19	17	follow-up not completed	follow-up not completed
5	6	Female	15	13	10	5	0
6	3	Male	33	28	24	15	0
7	2	Male	29	27	20	13	0
8	9	Female	14	12	6	3	0
9	10	Female	12	10	10	7	0
10	11	Male	9	8	8 (decrease in size)	8 (decrease in size)	8 (decrease in size)
11	4	Female	7	7	7	7	7
12	2	Male	17	17	16	follow-up not completed	follow-up not completed
13	3	Male	8	7	7	5	3
14	1.5	Female	15	15	14	10	5
15	8	Male	22	19	14	8	0
16	6.5	Female	28	20	12	5	2
17	4	Male	11	10	7	5	2
18	5.5	Male	16	15	10	4	0
19	3	Female	10	10	6	4	0
20	7	Male	29	25	18	12	0
21	8	Male	13	10	5	3	0
22	2.5	Female	16	16	12	8	0
23	9	Male	33	30	28	18	10
24	6	Female	24	22	18	10	0

Table 2: Clinical Response in Molluscumcontagiosum and Lesions After Treatment

Clinical Response	Patients
Complete elimination of lesions by week two	0
Complete elimination of lesions by week four	2
Complete elimination of lesions by week six	5
Complete elimination of lesions by week eight	6
Decrease in size of lesions without improvement in number	1
No improvement after 8 weeks	2
Not completed follow-up	5
Total patients	24

experienced resolution of lesions, highlighting that sustained treatment efforts can yield beneficial outcomes. Patients who reached this milestone demonstrated various reductions in lesion numbers in earlier assessments, suggesting that the treatment was gradually taking effect. By the 8th week, six patients achieved complete elimination of lesions, underscoring the treatment's effectiveness over time. This result aligns with the overall pattern observed in previous weeks, where many patients progressively reduced their lesion counts. These findings emphasize that although some patients may not have shown rapid responses, the sustained treatment resulted in substantial clinical improvement for a significant number of patients by the end of the treatment period.

In addition to those achieving complete elimination, one patient exhibited a decrease in the size of lesions without a corresponding reduction in their number. This scenario illustrates a partial response to treatment, suggesting that while the lesions may have become less pronounced, the underlying condition was not fully resolved. Such cases highlight the complexity of treatment responses and the need for ongoing monitoring and potential adjustments to therapeutic strategies. Despite the overall positive outcomes, two patients showed no improvement after 8 weeks. This lack of progress raises concerns about the effectiveness of the treatment for certain individuals, indicating that alternative treatment options or a reassessment of the therapeutic approach may be necessary for these cases. Moreover, five patients were lost to follow-up throughout the study, leaving their outcomes unknown. The loss of these patients presents challenges in evaluating the treatment's overall efficacy and the robustness of the findings. It underscores the importance of patient adherence to follow-up appointments and the potential need for strategies to improve retention in clinical studies. The findings of this study highlight the potential of oral ranitidine as a treatment for molluscum contagiosum in pediatric patients. Over the 8-week treatment period, significant improvements were observed in many patients, with most showing either a reduction in lesion size or complete clearance of lesions. This outcome is consistent with previous research suggesting that immunomodulatory drugs like ranitidine can play a role in enhancing immune responses, particularly in viral infections. In comparison to traditional treatments such as cryotherapy, curettage, or topical therapies, which are often associated with side effects like scarring, pain and post-inflammatory hyper pigmentation, ranitidine presents a less invasive alternative. Studies have demonstrated that the physical interventions for molluscum contagiosum can be particularly distressing for children due to the pain and discomfort involved. For instance, a study by[5] noted that traditional methods, while effective in lesion removal, often resulted in high levels of anxiety in children, primarily because of the invasive nature of these treatments. In contrast, ranitidine, as an oral medication, is not only easier to administer but also minimizes the risk of

visible scars or pigmentation changes, which is particularly important when treating facial lesions[5]. Moreover, the use of oral immunomodulators in viral skin infections is supported by research on cimetidine, a drug that shares similar immunomodulatory properties with ranitidine. Cimetidine has been explored as an off-label treatment for viral skin conditions like warts and molluscum contagiosum. For instance, a study by Mullen[6] found that cimetidine had a moderate success rate in reducing lesion numbers in patients with molluscum contagiosum, albeit with mixed results depending on the immune status of the patient[6]. While this study focused on ranitidine, the parallels with cimetidine provide a basis for understanding how this class of drugs can enhance immune function, especially through their T-cell-mediated effects, which are crucial for viral clearance. The mechanism by which ranitidine aids in lesion reduction can be attributed to its role as an H2-receptor antagonist, which not only suppresses gastric acid secretion but also modulates immune responses. Studies suggest that H2-receptor antagonists can inhibit the suppressor activity of T-cells, leading to enhanced immune responses against viral pathogens. This theory is supported by research conducted by Kamal[7], who demonstrated that H2 blockers could increase the cytotoxic activity of natural killer cells and enhance the body's ability to clear viral infections[7]. While this immunomodulatory action has been well-documented in conditions like viral warts, its application to molluscum contagiosum is still an emerging area of study. In this study, the treatment outcomes varied among patients, with some achieving complete clearance of lesions by the 4th week, while others showed a slower response. This variation in response times aligns with findings from previous research, which suggests that patient-specific factors, including age, immune statusS and lesion severity, can influence the effectiveness of treatment. For example, a study by Jafarzadeh[8] found that younger patients and those with fewer initial lesions responded more rapidly to immunomodulatory treatments than older patients or those with extensive lesions[8]. These observations are consistent with this study, where younger patients, such as the 2-year-old male (patient 7), showed significant lesion reduction by the 6th week.

Additionally, the loss of follow-up observed in this study is a common challenge in clinical research involving pediatric patients. Previous studies have also reported difficulties in maintaining long-term follow-up, especially in non-invasive treatments where parents may perceive the disease as less serious due to the absence of severe symptoms. This issue was also highlighted by Filler[9], who noted that parents often discontinue treatment early once visible improvements are observed, which can result in incomplete data on long-term efficacy[9]. Despite the promising results of this study, it is essential to acknowledge that not all patients experienced complete resolution of lesions. Two patients showed no improvement by the end of the 8-week period, indicating that ranitidine may not be effective for all cases of molluscum contagiosum. This finding echoes the conclusions of a study by Nguyen[19], which observed that immunomodulatory treatments could be less effective in patients with compromised immune systems or those with extensive lesions[10]. Therefore, it is crucial to consider adjunct therapies or alternative treatments for patients who do not respond to ranitidine.

CONCLUSION

In conclusion, this study supports the use of oral ranitidine as a viable non-invasive treatment for molluscum contagiosum in children, particularly for those who wish to avoid the risks associated with more invasive methods. The findings align with the growing body of literature on immunomodulatory treatments, though further research with larger sample sizes and long-term follow-ups is necessary to establish the drug's efficacy and safety profile more definitively. The potential for ranitidine to provide a safer and less distressing treatment option offers hope for improved management of this common pediatric skin condition.

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