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Original Research Article

Efficacy of intralesional immunotherapy with measles, mumps and rubella virus vaccine for the treatment of warts

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ABSTRACT

Background: The human papillomavirus (HPV) is the cause of warts, which are benign epithelial proliferations. Traditional therapies, such as salicylic acid and cryotherapy, frequently have poor results and a high rate of recurrence. A viable substitute is intralesional immunotherapy using the MMR vaccine, which boosts the host immune system to eradicate HPV-infected cells. The purpose of this study was to assess the intralesional MMR vaccine's effectiveness and safety in treating warts.
Methods: Fifty-two patients with warts participated in a randomized clinical trial. Five intralesional MMR vaccination sessions were given to the participants at two-week intervals. At baseline and following five sessions, wart size and resolution were measured. Throughout the course of the study, adverse effects were observed.
Results: After five sessions, 73.1% of patients had completely cleared their warts. There were no notable systemic side effects, and the most frequently reported adverse effect was mild erythema at the injection site.
Conclusions: The intralesional MMR vaccine is a safe and efficient way to treat warts. It is less expensive than traditional treatments and has a lower chance of recurrence. To verify its long-term effectiveness, more research with bigger sample sizes and longer follow-up times is required.

Keywords: Warts, Human papillomavirus, MMR vaccine, Intralesional immunotherapy, Wart treatment, Immunotherapy

INTRODUCTION

A DNA virus that belongs to the Papillomaviridae family, the human papillomavirus (HPV) is the cause of warts, a common dermatological disorder. When HPV infects keratinocytes in the skin and mucous membranes, it results in hyperproliferation and the formation of benign epithelial tumors. There are over 100 different variants of HPV; HPV-6 and 11 are associated with genital warts, however HPV-1, 2, 4, 27, and 57 subtypes are the main causes of common warts.[1-5] Direct skin contact, autoinoculation, and fomites are the three means by which HPV is spread. Immunosuppression, minor skin damage, and occupational exposure (e.g., in healthcare workers or butchers) are predisposing factors.[6] Based on the clinical manifestation, warts can be classified into verruca vulgaris or common warts, verruca plantaris or plantar warts, verruca plana or flat warts, filiform warts and genital warts (*Condyloma acuminata*). There are numerous treatment options, such as immunotherapy, laser therapy, electrocautery, cryotherapy, and salicylic acid.[6,7]

The search for more efficient and patient-friendly methods is necessary as these treatments are frequently linked to pain, recurrence and incomplete clearance. It has been suggested that the MMR vaccine is a new therapeutic option due to its ability to generate a robust

immune response. Injecting the MMR vaccine intralesionally has been demonstrated to trigger an immune-mediated response that leads to wart regression through enhanced antigen presentation and cytotoxic T cell activation.[8-10] The cost-effectiveness and high response rates of MMR immunotherapy have also been shown by Indian research when compared to traditional methods.[11]

The objective of this study is to evaluate the efficacy and safety of intralesional MMR injections for treating warts.

METHODS

Study design

A randomized clinical trial was conducted for a year in the dermatology outpatient department (OPD) of SS Institute of Medical Sciences and Research Centre, Davangere following approval by the institutional ethics committee. The study included 52 patients with warts.

Inclusion criteria

Age: 18-65 years, presence of warts at any anatomical site, no significant comorbidities, willingness to participate and adhere to the treatment protocol.

Exclusion criteria

Pregnancy or lactation, History of allergic reactions to the MMR vaccine, Immunocompromised conditions (HIV, transplant recipients, immunosuppressive therapy), History of keloid formation or hypertrophic scarrin. Active viral, bacterial, or fungal skin infections. Concurrent treatment with other wart therapies

After explaining about the study, informed consent was taken from the participants. A detailed history of age, gender, occupation, duration and examination was carried out in all the patients. This randomized controlled trial involved 30 patients with all types of warts. The MMR vaccine was injected intradermally at the base of the largest wart (the "mother wart").

Participants received 0.3 ml of MMR vaccine every two weeks for a total of five sessions, administered at 0 weeks, 2 weeks, 4 weeks, 6 weeks, and 8 weeks.

Adverse effects, including local and systemic reactions were monitored and documented throughout the study.

The data were analyzed using SPSS software. Institutional Ethical Clearance was obtained for the study.

RESULTS

Of the 52 patients in the study, 22 (42.3%) were female and 30 (57.7%) were male, with a mean age of 42 years and a range of 20 to 65. After completing five sessions of intralesional MMR vaccine, majority of the patients showed a complete response which include 38 cases (73.1%) out of total 52 patients. Only 6 patients (11.5%) showed a partial response and 8 cases (15.4%) showed no response.

The treatment was generally well tolerated, with the most common side effect being mild erythema at the injection site. Additionally, four images are included to demonstrate the treatment's effects.

These findings further support the role of MMR vaccine immunotherapy as an effective and well-tolerated therapeutic option, demonstrating high clearance rates and minimal side effects.

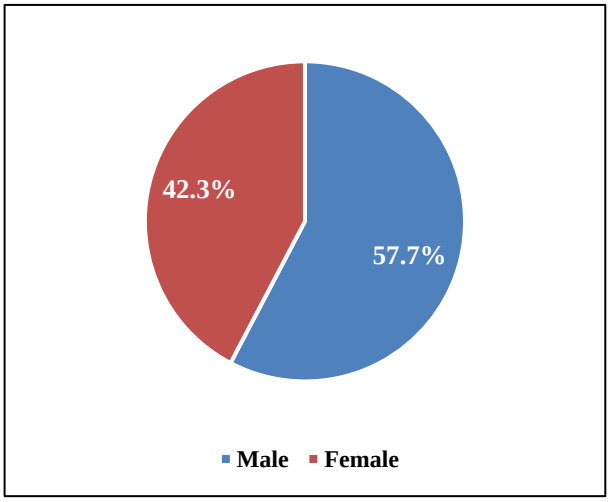

Figure 1: Gender distribution among study participants.

Figure 2 (A and B): Verucca vulgaris over hand showing complete resolution after three sessions.

Figure 3 (A and B): Verucca vulgaris over foot showing complete resolution after three sessions.

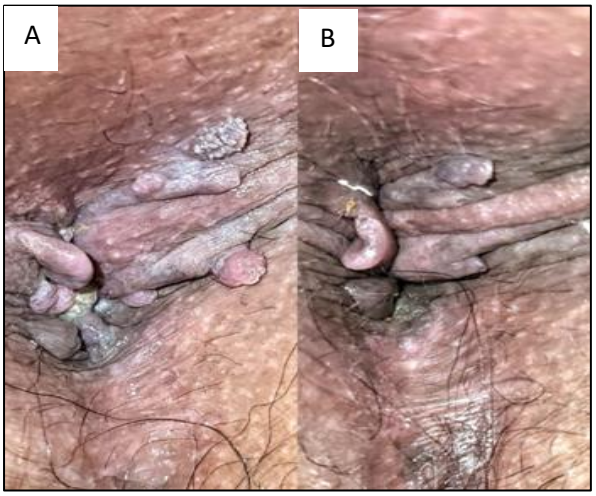

Figure 4 (A and B): Perianal wart showing 80% resolution.

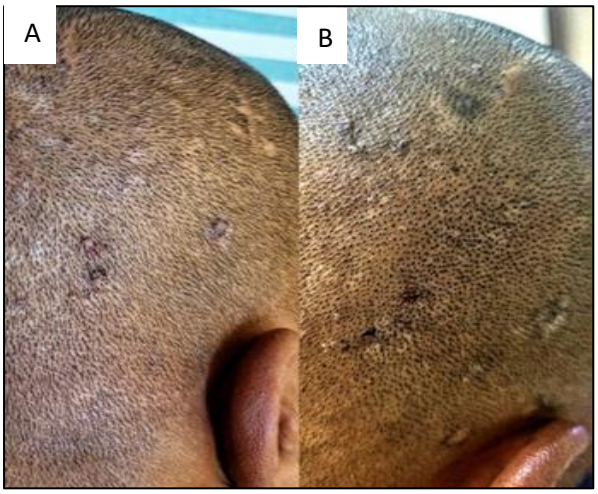

Figure 5 (A and B): Verucca vulgaris over scalp showing 70% resolution.

DISCUSSION

This study validates prior research showing that the MMR vaccine benefits to treat warts by enhancing the immune system. The immune response generated by the MMR vaccine likely contributes to HPV clearance, as does the case with other immunotherapeutic approaches such as injections of Candida antigen and tuberculin purified protein derivative (PPD).[9,13,14]

One major benefit of MMR immunotherapy over cryotherapy and topical therapies is its ability to produce systemic immunity, which reduces recurrence rates. In our study majority of the subjects were males which included 30 (57.7%) patients and females were 22 (42.3%). A study conducted by Nofal et al also showed a male predominance in their study which was similar to our study.[2] This male predominance may be due to increased environmental exposure and occupational factor.

The response rate in this study was 73.1% after five sessions which was higher than the study conducted by Kus et al (29.4%) and Rezai et al (65.2%) .[3,15] According to Indian studies, 70–80% of cases treated with the MMR vaccine experience long-term remission (4,5). The majority of side effects, including localized erythema and swelling, are mild and temporary, and the treatment is also well tolerated. Its convenience is increased by the fact that it can treat several warts by focusing on a single lesion. Comparative research with other immunotherapeutic drugs, such as the Candida antigen or Bacillus Calmette-Guerin (BCG) vaccine, may also shed more light on the most effective way to treat warts.

CONCLUSION

Our findings reinforce the fact that intralesional MMR vaccine therapy is effective, safe, and tolerable modality for treatment of warts. MMR vaccine seems to be less painful and associated with minimal side effects compared to other destructive methods like electrocautery, radiofrequency ablation and cryotherapy. Furthermore, MMR vaccine therapy is less expensive than other immunotherapeutic agents, which makes it a good choice in environments with limited resources.

The short follow-up duration and limited sample size are disadvantages of the study.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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