International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 4, April 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.4.2025.103

Original Research

To Compare the Effectiveness of the Intralesional MMR Vaccine and Intralesional Vitamin D3 In the Treatment of Extra Genital Verrucas in Adults older than 18 Years

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Received Date: 18 February 2025 Acceptance Date: 14 March 2025

ABSTRACT

Introduction: Warts are common epidermal lesions caused by the Human Papillomavirus (HPV). Treatment options include destructive therapies, antiproliferative agents, antiviral treatments, and immunotherapy. Immunotherapy has gained interest due to its potential to enhance the host immune response, leading to the resolution of warts without recurrence or scarring.

Objectives: This study compares the effectiveness of intralesional MMR (Measles, Mumps, and Rubella) vaccine and intralesional Vitamin D3 in treating extra- genital verrucas in adults.

Methods: A prospective, comparative longitudinal study was conducted on 200 participants (100 in each group) diagnosed with extra-genital warts. Group A received intralesional MMR vaccine injections, while Group B received intralesional Vitamin D3. The treatment response was evaluated based on wart size reduction, clearance, and side effects.

Results: Both treatment modalities showed significant effectiveness in wart clearance. The MMR vaccine demonstrated a higher complete response rate, while Vitamin D3 also showed promising results with fewer side effects. The study found a statistically significant association between treatment efficacy and the type of immunotherapy used (p-value = 0.001).

Conclusion: Intralesional MMR vaccine and Vitamin D3 are both effective for treating extra- genital verrucas, with MMR vaccine showing slightly better results. Immunotherapy remains a promising alternative to traditional wart treatments due to its ability to enhance the immune response.

Key Words: Warts, human pappilomavirus, immunotheraphy, cytokines.

INTRODUCTION

Human papillomavirus (HPV) infection results in warts, which are papulonodular epidermal lesions with a horny or papillomatous surface[1].

Around the world, warts are a most prevalent skin condition, Although it can happen at any age (most frequent in children). Extra-genital wart prevalence is believed to be between 5 and 10% in the general adult population, but it may be higher in persons with weakened immune systems (e.g., HIV)[1]. Within a few months to a few years, warts may spontaneously clear at any time[2,3].

Type of virus, the host's immune status, and the size and duration of the warts all affect the rate of clearance[4].

Salicylic acid, trichloroacetic acid, cryotherapy, silver nitrate, phenol, cantharidin, surgery, and lasers are examples of destructive therapies used to treat warts; bleomycin, vitamin D analogs, podophyllin, podophyllotoxin, and 5-fluorouracil are examples of antiproliferative agents; cidofovir and retinoids are examples of antiviral agents[2]. Other techniques include acupuncture, therapeutic vaccination, local hyperthermia, and combinations of the above mentioned treatments[5].

Therapies involving destructive methods are typically uneasy, require several sessions and treat each wart separately[6].

Immunotherapy is a effective treatment for recurrent or resistant warts. It may resolve the condition without causing any physical changes or scarring, and it may

DOI: 10.69605/ijlbpr_14.4.2025.103

also strengthen the host's defenses against the causing agent, due to which recurrence of warts is decreased[7].

MATERIALS AND METHODOLOGY

A Prospective comparative longitudinal study was carried out among 200 wart patients attending Dermatology outpatient department of Rajshree medical research institute, Bareilly for a period of 1 year. The study subjects were divided into two groups with 100 participants in each group. Group 1 received intralesional injection of up to 0.5 ml of reconstituted MMR whereas group 2 received a maximum of 0.5 mL Inj. Vitamin D3 (600,000 IU; 15 mg/ml) in each session. A maximum of five verrucas was injected at once in cases of numerous warts. A maximum of three dose administered with a gap of 2 weeks for each warts[8]. Patients presenting with extragenital verruca and age >/= 18 years were enrolled in this study. Following patients were excluded from the study who had any systemic or topical treatment of verrucas for the last 4 weeks; past history of an allergic response to MMR or Vitamin D3 or any other vaccine; current acute febrile illness or bacterial infection.

Clearance from the institutional ethics committee and informed consent from study subjects were taken before commencing the study. Verruca size and number decrease and treatment response were evaluated by the patient and doctor. The patient had scored the clinical improvement as a complete response, good response, moderate response, bad response, or no response. Data was entered and coded in Microsoft excel spreadsheet. Data analysis was done by using SPSS-26 version software.

RESULT

Table 1: Distribution of age of study population

Age(in years)	Group1(MMR)		Group2(VitaminD3)		p-value
	Frequency	Percent	Frequency	Percent	
18 to 30	18	18.0	10	10.0	3.644
31 to 40	12	12.0	22	22.0	
41 to 50	26	26.0	18	18.0	
51 to 60	23	23.0	29	29.0	
61 to 70	17	17.0	14	14.0	
71 to 80	4	4.0	7	7.0	
Total	100	100.0	100	100.0	

In our study, the minimum study participants were between the ages of 71- 80 in both Groups 1 and 2, while the maximum study participants were between the ages of 41-50 in Group 1 and 51-60 in Group 2.

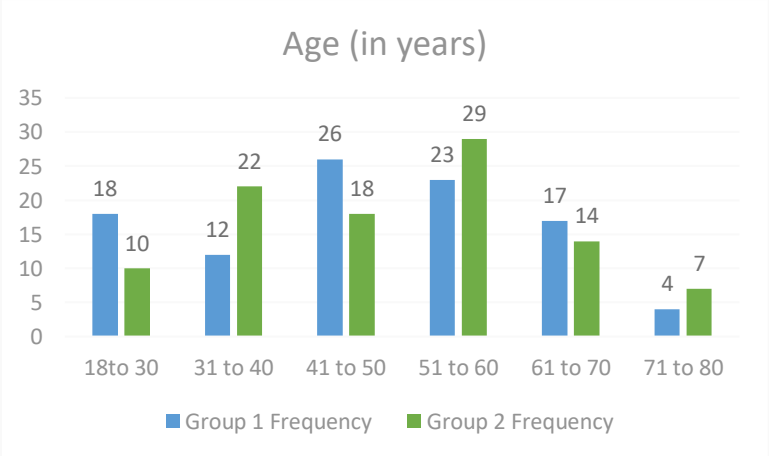

Figure 1: age distribution among the study participants

Table 2: Distribution of gender among the study population

Gender	Group 1 (MMR)		Group2 (VitaminD3)		p-value
	Frequency	Percent	Frequency	Percent	
Male	57	57.0	62	62.0	0.325
Female	43	43,0	38	38.0	
Total	100	100.0	100	100.0	

DOI: 10.69605/ijlbpr_14.4.2025.103

In our study, Group 1 included 57 males and 43 females, while Group 2 had 62 males and 38 females. P value (0.325) suggests that gender distribution in both groups is not significantly different.

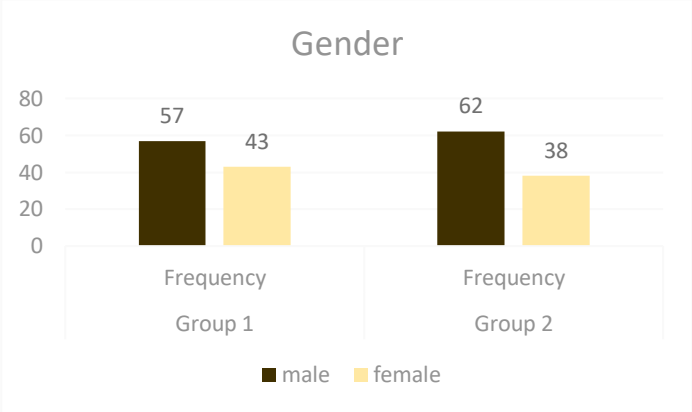

Figure 2: gender distribution among the study participants

Table 3: Distribution of socioeconomic status among the study population

Socioeconomic Status	Group 1		Group 2		p-value
	Frequency	Percent	Frequency	Percent	
Upper	1	12.0	1		0.051
Upper middle	2	56.0	1	64.0	
Lower middle	24	24.0	34	34.0	
Upper lower	32	32.0	29	29.0	
Lower	41	41.0	35	35.0	
Total	100	100.0	100	100.0	

In this study, maximum study participants belonged to lower socioeconomic status in Group 1 as well as in Group 2, whereas minimum study participants belonged to upper socioeconomic status in Group 1 as well as in group 2.

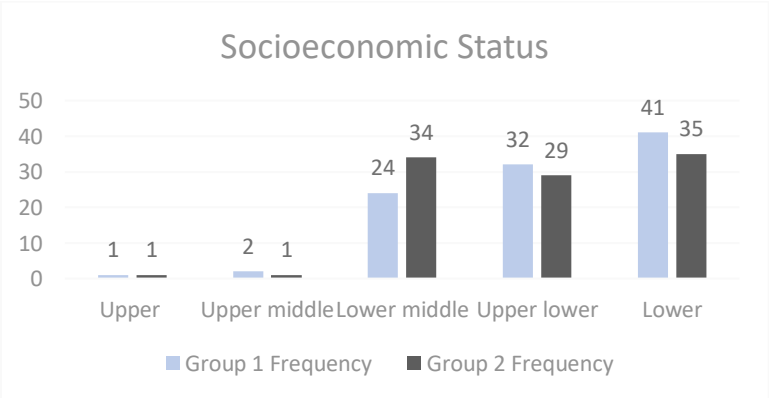

Figure 3: Distribution of socioeconomic status among the study participant

Table 4: Distribution of locality of study population

Locality	Group 1		Group 2		p-value
	Frequency	Percent	Frequency	Percent	
Rural	69	69.0	31	31.0	0.952
Urban	31	31.0	69	69.0	

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Total	100	100.0	100	100.0	

In our study, 69 study subjects belonged to rural locality and 31 study subjects belonged to urban locality in group1 whereas 31 study subjects belonged to rural locality and 69 study subjects belonged to urban locality in group 2.

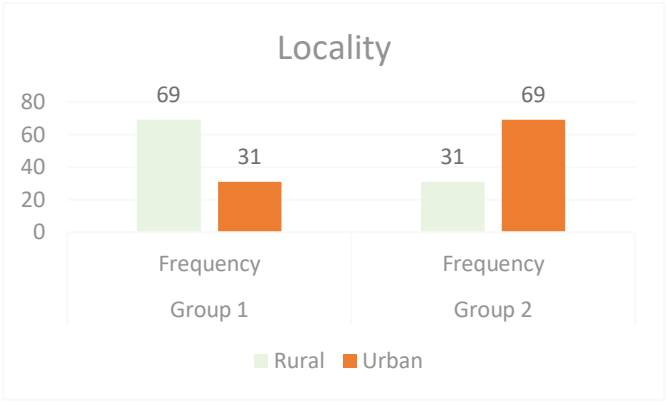

Figure 4: Distribution of locality among the study participants

Table 5: distribution of efficacy of treatment among the study participants

Injected warts	Group 1		Group 2		p-value
	Frequency	Percent	Frequency	Percent	
Complete response	78	78.0	70	70.0	0.001
Excellent response	12	12.0	16	16.0	
Good response	8	8.0	11	11.0	
Poor or no response	1	1.0	1	1.0	
Recurrence	1	1.0	2	2.0	
Total	100	100.0	100	100.0	

In table 5, maximum study participants belonged to complete response after treatment in Group 1 as well as in Group 2 whereas minimum study participants belonged to poor or no response after treatment in Group 1 as well as in Group 2. There was a statisticaly significant association of intralesional MMR vaccine and intralesional Vitamin D3 in the treatment of extra genital verrucas in adults with number of efficacy of treatment (p-value = 0.001).

Figure 5: Bar chart showing distribution of efficacy of treatment of study population

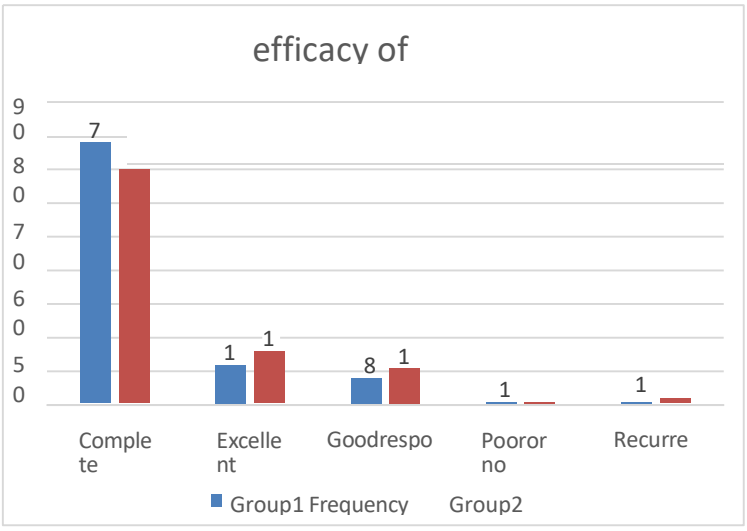

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Table 6: distribution of lesions after treatment among the study participants

lesions after treatment	Group 1		Group 2		p-value
	Frequency	Percent	Frequency	Percent	
0-30 % cured	3	3.0	2	2.0	0.002
31-70% cured	12	12.0	19	19.0	
71-100% cured	85	85.0	79	79.0	
Total	100	100.0	100	100.0	

In table 6, maximum study participants belonged to 71-100% cured lesions after treatment in Group 1 as well as in Group 2 whereas minimum study participants belonged to 0-30 % cured lesions after treatment in Group 1 as well as in Group 2. There was statisticaly significant association of intralesional MMR vaccine and intralesional Vitamin D3 in the treatment of extra genital verrucas in adults with number of lesions after treatment (p-value = 0.002).

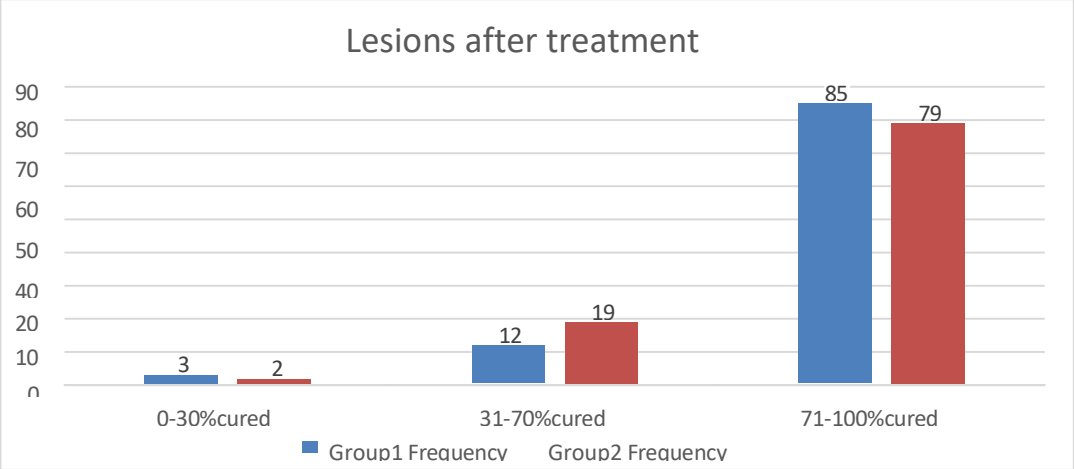

Figure 6: Distribution of lesions after treatment among the study participants

DISCUSSION

Human papillomavirus (HPV) infection causes warts, also known as verruca vulgaris, which are papulonodular epidermal lesions with a horny or papillomatous surface and is common in our society. Several studies have been conducted on the treatment of warts by intralesional injection of reconstituted MMR or Inj. Vitamin D3. Most studies have found similar efficacy of both treatment with minimal side effects. Our study was a prospective comparative longitudinal study. The study subjects were divided into two groups with 100 participants in each group. Group 1 received intralesional injection of up to 0.5 mL of reconstituted MMR whereas group 2 received a maximum of 0.5 mL Inj. Vitamin D3 (600,000 IU; 15 mg/ml) in each session. Mean age was 50.03 years with male predominance. Mostly study participants had rural habitat.

In our study, maximum study participants belonged to 41-50 years in Group 1 and 51-60 years in Group 2 whereas minimum study participants belonged to 71-80 years in Group 1 as well as in Group 2. There were 57 males and 43 females in Group 1 whereas there were 62 males and 38 females in Group 2. There was no association age (p-value = 3.644) or gender (p-value = 0.325). Similarly, **Ahmed et al**[9] found no statistical association with age or gender. **Surani et. Al**[10] conducted a interventional study where mean age was 28.22± 10.98. Of 94 patients, 83 (88.3%) were men and 11 (11.7%) were women. **Chauhan et. Al**[11] conducted a Pilot study in 110 patients of which 61 were male and 49 were female.

While the minority of study participants in both Groups 1 and 2 had upper socioeconomic position, the majority of study participants in both Groups 1 and 2 had lower socioeconomic status. Socioeconomic status was statistically associated (p-value = 0.051). In group 1, there were 69 study participants from rural areas and 31 from urban areas; in group 2, there were 31 from rural areas and 69 from urban areas. Locality had no correlation (p-value = 0.952).

We found that maximum study participants belonged to complete response after treatment in Group 1 as well as in Group 2 whereas minimum study participants belonged to recurrence after treatment in Group 1 as well as in Group 2. There was statisticaly significant association of intralesional MMR vaccine and intralesional Vitamin D3 in the treatment of extra genital verrucas in adults with number of efficacy of treatment (p-value = 0.001). Similarly, **Kareem et. al**[12]. noted that complete clearance of the target injected warts occurred in 40% of patients in cases

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group while it occurred only in 5% of patients in control group ($p \leq .001$) that was statistically significant. In contrast to our findings. **Gamil et.al**[13], conducted a Prospective study, the results revealed complete clearance of the warts in 20 patients (87%), partial response in one patient (4.3%), and no response in two patients (8.7%). **Chauhan et al.**[14] found that 51 patients completed the study and 42 (82.4%) of them showed complete clearance of warts and 9 (17.6%) patients showed good or unsatisfactory response. In 4 (7.8%) patients, the warts subsided completely after one dose itself. The four patients showing excellent response after five doses initially also continued to improve during follow-up period of 8 weeks.

CONCLUSION

Both intralesional MMR vaccine and vitamin D3 are effective immunotherapies for extragenital warts in adults, with comparable efficacy overall. While some studies show slightly higher complete response rates with MMR (consistent with the user's findings of 78% vs 70%), vitamin D3 may be better tolerated with fewer side effects. The choice between them may depend on wart type (MMR for verruca plana, vitamin D3 for filiform), patient preference regarding side effects, and cost/availability considerations. Both represent excellent immunotherapy options that can clear both treated and distant warts while minimizing recurrence compared to destructive methods. Further large-scale randomized controlled trials with standardized protocols would help clarify any potential superiority of one modality over the other.

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