INTRODUCTION

Common warts (verruca vulgaris), plantar warts (verruca plantaris), flat or planar warts (verruca plana), and genital warts (condyloma acuminata) are some of the clinical manifestations of human papillomavirus infection. Warts are estimated to occur in up to 10% of children and young adults. The range of greatest incidence is between 12 and 16 years of age. Warts occur with greater frequency in girls than in boys. The peak incidence is at 13 years of age in females and 14.5 years of age in males [1]. In India, various recent studies have shown that the incidence of warts represents 2.5±9% of patients and 14.5 years of age in males [1]. In India, various recent studies have shown that the incidence of warts represents 2.5±9% of patients attending a dermatology department [2-4]. In the present study, we have shown that the incidence of warts represents 2.5±9% of patients attending a dermatology department [2-4]. In the present study, we used formic acid for the treatment of palmpoplantar warts. Formic acid is a carboxylic acid. It is so named because it was first obtained by the distillation of red ants (Latin: Formica = ant). It is used in various industries [1,5,6].

Current available therapies for warts are Salicylic acid, available in a variety of formulations with or without additives such as lactic acid, cryotherapy with liquid nitrogen, destructive treatments such as topical acids, cantharidin, surgical excision, laser ablation, electro surgery, virucidal therapies include imiquimod, interferons, bleomycin, cidofovir, acyclovir, 5-fluorouracil, tretinoin, podophyllin, podophyllotoxin, formaldehyde, and glutaraldehyde, immunologic therapies like topical sensitizers, intra-lesional sensitizers. Alternative therapies include radiation, acupuncture, ultrasound, hypnosis, localized heat therapy, folk therapies, and homeopathy [7-11].

METHODS

An open, non-randomized, comparative study was conducted on patients with palmpoplantar warts who reported to the dermatology outpatient department of Father Muller Hospital, Mangalore.

RESULTS

A total of 15 patients (males and females) received 85% formic acid application (Group I) and 15 patients (males and females) received 30% formic acid using a to puncture technique every day.
(17/30), followed by feet (14/30). Many patients had involvement of more than one site. None of the patients developed any secondary infection. A mild burning sensation was observed in all patients at the time of application of formic acid, which disappeared within a few minutes. This stinging sensation was more in Group I when compared to Group II. Minimal scarring was seen after healing of lesions. No other side-effects were observed in these patients. Efficiency of therapy was assessed at the end of 3 months of treatment: 73.3% in Group I (Figs. 1-4) and 73.3% in Group II (Figs. 5-10) showed the disappearance of warts.

**DISCUSSION**

In this study, formic acid application for warts was safe, effective and economical therapy with minimal side-effects. Among the various
caustic acids used in the treatment of common warts, salicylic acid is the weakest, trichloroacetic acid is of medium strength, and bichloroacetic acid is the strongest. Formic acid is stronger than salicylic acid but less caustic than trichloroacetic acid. In the field of dermatology, 8% formic acid has been shown to be useful as a post-pediculocide nit removal system [12]. The mechanism of action of salicylic acid in warts involves keratolysis of virally infected tissues [13]. Trichloroacetic acid and bichloroacetic acid are powerful irritants that work by hydrolyzing the cellular proteins, leading to inflammation and cell death. The exact mechanism of action of formic acid is not known. It probably acts in a manner similar to formalin which causes destruction of the wart-infected tissue by dehydration [14]. After application of formic acid, the wart becomes slightly whitish in color and the superficial layer peels off indicating a keratolytic effect. Formic acid puncture may also help in inducing regression of the warts. Regression of plane warts following spontaneous inflammation has been reported [15]. It is a relatively painless procedure, can be used in children, and also for the treatment of periungual warts. It does not require any local anesthesia and scarring is minimal. Use of 85% formic acid is one of the most commonly used topical therapies for the treatment of common warts. Bhat et al. and Shamsadhini et al. used 85% formic acid and showed cure rates of 92% and 81% respectively. In the study by Bhat et al. 12% of the patients developed secondary infection. The presence of pain following application of formic acid though transient can be bothersome symptom.

CONCLUSION

In this study, we found that 30% formic acid has the same effect when compared to 85% formic acid after 3 months of treatment (73% cure rates in both. p value was not significant). Side-effects such as pain were more in Group I as compared to Group II. Hence, 30% formic acid may be considered as a replacement for 85% formic acid. Also, studies are needed to test the efficacy of the same over other body sites other than palmoplantar areas.

REFERENCES

9. Gibbs S, Harvey I, Sterling J, Stark R. Local treatments for cutaneous


