Original Article

Viral Warts in Children Seen at a Tertiary Referral Centre

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Abstract

Introduction: This study aims to determine the epidemiology of viral warts in children seen at a tertiary referral centre and the treatments used. Materials and Methods: This is a retrospective study of viral warts in children aged 12 years and below seen at the National Skin Centre in the year 2000. Results: There were 302 cases of viral warts, 187 (61.9%) in boys and 115 (38.1%) in girls. The greatest number was seen at age 12 and none were noted in those below 1 year of age. The racial breakdown was as follows: 69.9% Chinese, 13.9% Malays, 11.3% Indians and 4.9% of other ethnic groups. Treatment with liquid nitrogen was used most commonly in 267 (88.4%) cases, with a clearance rate of 48.3%. Electrocautery was used in 11 cases with complete clearance in 8 cases. Conclusion: Viral warts are common in children, but uncommon in infants. There is no difference in distribution of warts among the races in Singapore. Liquid nitrogen and electrocautery are effective treatments of viral warts in children.

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Key words: Cryotherapy, Electrocautery, Paediatric, Verruca vulgaris

Introduction

Viral warts are a common affliction in children. It is caused by the human papilloma virus, of which there are more than 80 serotypes. There have been several studies on the prevalence of viral warts in school children. In a study of 3029 primary school children in Taiwan,[1] the incidence of viral warts was 6.9%. In Australia, the overall prevalence of warts was 22% among school children in the state of Victoria.[2] Currently, there is little information on the epidemiology of viral warts in children in Singapore, with a multi-racial population of Chinese, Malay, Indian and other races.

Materials and Methods

This is a retrospective study of viral warts in children aged 12 years and below. They were seen at the National Skin Centre (NSC), Singapore from January 2000 to December 2000. All cases of viral warts below the age of 13 were included in the study. The diagnosis of viral warts was based on clinical diagnosis by the attending dermatologist. Those with genital warts were excluded. Cases presenting primarily with viral warts and secondary or incidental cases of viral warts were included in the study. Majority presented with viral warts as their presenting complaint. All the case records of the patients were retrieved and the clinical information on the patients' biodata, site of lesions, treatment and outcome were collated. Complete clearance was defined as total clearance of the warts, with no evidence of residual warts. Partial clearance was defined as improvement in the number and/or size of warts but without complete eradication of the warts. No improvement was defined as warts that did not reduce in number or size or worsened with treatment.

Results

There were 302 cases of viral warts in children aged 12 years and below. Figure 1 shows the age and sex distribution of viral warts. The number of boys and girls were 187 (61.9%) and 115 (38.1%), respectively. There were none below 1 year of age with viral warts. The greatest number was seen at age 12. In the year 2000, the sex breakdown of paediatric cases seen in our centre was 2481 (50.0%) male and 2473 (50.0%) female cases.

The racial breakdown was 211 Chinese (69.9%), 42 Malays (13.9%), 34 Indians (11.3%) and 15 (4.9%) from other ethnic groups.

Table 1 shows the distribution of warts according to sites of involvement. Most of the lesions were located on the hands (118), followed closely by lesions on the feet (116), with the

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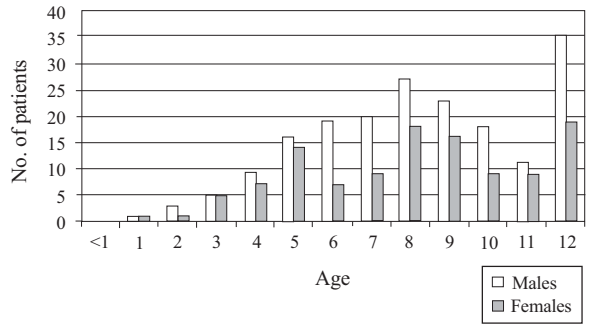

Fig. 1. Age and sex distribution of viral warts in children seen at the National Skin Centre in the year 2000.

Table 1. Sites of Involvement of Viral Warts

Site	Males (%)	Females (%)	Total (%)
Face	31 (10.3)	21 (6.9)	52 (17.2)
Trunk	7 (2.3)	3 (1.0)	10 (3.3)
Upper limbs	13 (4.3)	3 (1.0)	16 (5.3)
Lower limbs	16 (5.3)	7 (2.3)	23 (7.6)
Hands	76 (25.2)	42 (13.9)	118 (39.1)
Feet	69 (22.8)	47 (15.6)	116 (38.4)

trunk (10) being the least common site involved. In boys, the hands were the most common site (76), followed closely by the feet (69). In girls, the feet were the most commonly involved (47), followed closely by the hands (42).

The first-line modality of treatment for viral warts and treatment response is summarised in Table 2. Liquid nitrogen was the most common treatment modality, and 267 cases were treated using this method. In 48.3% (129), the warts cleared completely. In 9.4% (25), there was partial clearance and in 1.9% (5), it was documented as no improvement. A total of 113 (42.3%) of the patients treated with liquid nitrogen defaulted subsequent follow-ups. The number of treatments required to clear the warts ranged from 1 to 29 treatments, with a mean of 4.3 treatments. For patients who had complete clearance of viral warts, the average number of treatments required according to site was as follows: face (4.1), trunk (3.0), upper limbs (4.0), lower limbs (3.2), hands (5.2) and feet (5.4).

Topical salicylic acid 17% was the next most frequent modality used. Of the 13 patients using topical salicylic acid, 5 used it in combination with liquid nitrogen. Three of the patients showed complete clearance; 2 in combination with liquid nitrogen and 1 using salicylic acid only.

Eleven patients were treated with electrocautery. All were above 8 years of age. Complete clearance was documented in 8 patients. One child had partial clearance and 2 children defaulted on follow-up.

Other treatments used in decreasing order of frequency included 0.7% cantharidin paint (9), oral cimetidine (5), topical verrumal, (a combination of 10% salicylic acid and 0.5% fluorouracil) (5), topical imiquimod (4) and topical tretinoin 0.025% (2). Two patients did not receive any form of treatment.

Discussion

Viral warts are one of the most common diseases of the skin, often occurring in children and young adults. The face, knees, palms and soles are common sites of involvement. They commonly present as verruca vulgaris, plantar warts or plane warts. Common predisposing factors include trauma, biting and sucking of nails, and scratching. They are commonly asymptomatic, but may be painful or cosmetically unacceptable to the patient.

In a large epidemiology study of 9263 British school children aged between 11 and 16 years, the prevalence of warts was between 3.9% and 4.9%.[3] In a prospective survey of 10,000 paediatric dermatology patients in Kuwait,[4] viral wart was the second most prevalent dermatosis, with 13.1% of patients affected. Many patients with viral warts do not seek treatment and viral warts are known to resolve spontaneously. Kilkenny et al[2] showed that over 60% of children with warts did not seek any treatment for the warts. The study in British school children showed a 5-year clearance rate of 93%. However,

Table 2. First-line Treatment Modality for Viral Warts

Treatment modality	No. of patients	Complete clearance	Partial clearance	No response	Defaulted on follow-up	Remarks
Liquid nitrogen	267	129	25*	5	113	-
Salicylic acid	13	3	2	2	6	5 with LN
Imiquimod	4	1	2†	-	3	3 with LN
Cimetidine	5	2	1	-	2	2 with LN, 2 with Can
Tretinoin	2	1	1	-	-	1 with LN
Verrumal	5	1	-	-	4	1 with LN
Electrocautery	11	8	1	-	2	-
Cantharidin paint	9	2	2	1	4	2 with LN, 2 with Cim
No treatment	2	-	-	-	-	-

Can: cantharidin; Cim: cimetidine; LN: liquid nitrogen

* Five patients defaulted on their follow-up

† Both patients defaulted on their follow-up

there are patients who do not show spontaneous regression of warts on long-term follow-up.[5]

In our study, patients with warts, an easily identifiable and common problem, were referred from the polyclinics, private general practice and paediatric clinics. Viral warts were seen only in children above the age of 1. This concurs with the common observation that viral warts are seldom seen in infancy. There was an increasing trend with age and the greatest number of warts was noted in children aged 12 years. Previous population studies[6] showed the highest prevalence of warts to be in the 15 to 24 years age group. In a study of 8298 Swedish children aged between 12 and 16 years, Larsson and Liden[7] found an overall prevalence of 20.1% of viral warts, with the highest prevalence at age 12 (25.9%).

In other hospital studies,[8] a lower prevalence of viral warts was seen in Afro-Caribbeans compared with Caucasians. It has been suggested that this may be related to increased thickness of the stratum corneum in Blacks. For the year 2000, the racial distribution of all paediatric cases seen at NSC was as follows: 66.6% Chinese, 13.6% Malays, 11.6% Indians and 8.1% of other ethnic origins. This mirrors the distribution of viral warts in the paediatric population. There was no difference in the racial distribution among Chinese, Malays and Indians. To our knowledge, there has not been any data on the differences in predilection of viral warts in different Asian subpopulations.

There was a higher incidence of viral warts in boys in our study. This may be attributed to boys being more active in physical sports and games compared with the girls. It may predispose them to damage to the stratum corneum, which serves as an entry point for the virus.

The feet and hands were the most common sites of involvement in boys and girls. It has been previously reported that plantar warts are more common in females, this being attributed to more gymnastic and dancing activities in girls. The trunk was the least common site involved. The trunk is less exposed compared to other areas of the body and therefore, less prone to trauma and contact with the virus.

There are many treatment options for viral warts. Some dermatologists believe that viral warts do not require treatment as most clear spontaneously with time. However, treatment should be based on the symptoms, disfigurement or disabling effects of the warts and on patient's preference. In our study, 2 patients (0.7%) had elected not to receive any treatment.

Liquid nitrogen was the most common treatment method employed with 88.4% of the children treated using this method, but 42.3% of the cases had defaulted on follow-up. Reasons for the default were likely clearance of the lesions or failure to clear, although it is likely that both exist. A random phone interview of the patients who had defaulted on their follow-up was undertaken to determine the reasons for their default. Of the 60 patients called, we managed to contact 32 patients. Twenty-eight patients confirmed treatment success, with complete clearance of the lesions. Four patients had partial response to treatment. The clearance rate of viral warts was 48.3%. However, the actual rate is likely to be higher due to the patients in the default group who had complete clearance of warts. Cure rates of 70% to 85% have been reported in other studies.[9,10] Liquid nitrogen was used in all the age groups, including young children below 4 years of age, with good results.

Electrocautery with curettage is a good alternative treatment option for viral warts as only a single treatment is required and the clearance rate seems to be high. Patients selected for electrocautery had solitary or few warts (less than 3). All the patients were above the age of 7 years old. This method is probably less suitable for younger children, who may be unable to cope with the trauma of pain from the injections of local anaesthesia and treatment.

It was noted that some patients received salicylic acid treatments from their primary healthcare physicians before they were referred to our institution. A recent systemic review of local treatments of cutaneous warts[11] had found evidence that topical treatments with salicylic acid have a therapeutic effect, with a cure rate of 75% compared with 34% in placebo controls.

The use of oral cimetidine in treatment of viral warts is controversial. An open-label study by Gooptu et al[12] reported improvement in viral warts in 87% of children and 65% of adults treated with oral cimetidine. However, other studies[13,14] have not shown significant improvement. Imiquimod [15,16] has been used in the treatment of viral warts with varying success. Other methods such as cantharidin paint, which is an extract from the green blister beetle, and verrumal, are also used. However, the number of patients treated with these modalities was too few for meaningful interpretation of the results.

There are limitations to this study. As this is a descriptive retrospective study and there were a number of patients who were lost on follow-up, this could affect the interpretation of the findings. Furthermore, there were no control groups to determine the rate of spontaneous clearance of warts in the patients.

Viral warts are a common problem in children but rare in infants. There is no difference among the races in occurrence of viral warts. Liquid nitrogen, used as a first-line treatment modality, is an effective treatment of viral warts. Electrocautery is the preferred alternative option in older children with few viral warts.

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