

Original Research Article

Recurrent vesicular palmoplantar dermatitis: a clinical study in children and adolescents

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ABSTRACT

Background: Previously known as dyshidrosis, recurrent vesicular palmoplantar dermatitis (RVPD) is presented as severe eruption of non-erythematous, symmetrical vesicles or bullae located along the lateral sides of fingers, on the palmar or plantar areas, and developing into a chronic and recurrent condition. Although very frequently observed on the hands, there are no specific studies about such eczema in children and adolescents. Objectives of current study was to study clinical profile of RVPD in children and adolescents, and monitor the association of RVPD with seasonal variations, hyperhidrosis, atopy and nickel sulphate.

Methods: A cross sectional study was carried out in fifty patients affected by RVPD coming to out-patient department of dermatology in regional institute of medical sciences, Imphal, Manipur for a period of 24 months (October 2019 to September 2021) were collected using questionnaire. Data including age, sex, seasonal variation, hyperhidrosis, and atopy were collected. Relevant laboratory investigations like KOH examination, patch testing etc. were performed. Children (<12 years) and adolescents (13-18 years) irrespective of sex coming to opd were included and those unwilling to participate and treated elsewhere were excluded. Ethical approval was obtained from research ethics board and statistical analysis was done using IBM SPSS version 21.

Results: Majority (44%) of patients were in the age group 1-5 years. Hyperhidrosis (12%) was identified as second most contributing factor for RVPD after idiopathic cases. Atopy was the most common associated factor followed by seasonal warm weather exacerbation.

Conclusions: RVPD onset may occur at an early age, developing into a chronic and recurrent infection. Hyperhidrosis and atopic status was established in the clinical profile.

Keywords: Dyshidrosis, Pompholyx, Children, Hyperhidrosis, Nickel allergy, Atopic dermatitis

INTRODUCTION

Recurrent vesicular palmoplantar dermatitis (RVPD) earlier known as dyshidrosis or pompholyx is a common disorder characterized by recurrent crops of vesicles or bullae on non-erythematous skin on the lateral aspects of fingers, palms and soles.^{1,2} It accounts for 5 to 20% of all cases of hand dermatitis.³ Although RVPD occurs

worldwide, it is less common among Asians.^{4,5} The peak age of onset is usually between 20 and 30 years. There is paucity of literature on RVPD previously targeting children and adolescents age group. An earlier study from north eastern India (Manipur) reported 6.5% prevalence among paediatric population.⁶ RVPD may have significant negative impact on the quality of life due to severe pruritus.³ Until today, the aetiology of RVPD remains

largely unknown. The present study was done to determine the demography, aetiology and clinical profile RVPD in children and adolescent population.

METHODS

A cross sectional study was conducted in 50 patients belonging to children and adolescent population (1-18 years) attending out- patient department of dermatology, venereology and leprology, regional institute of medical sciences, imphal, Manipur for a period of 24 months (October 2019 to September 2021). Children (≤ 12 years) and adolescents (13-18 years) irrespective of sex with clinical presentations of recurrent vesicular palmoplantar dermatitis coming to dermatology OPD, RIMS, Imphal were included and those who are unwilling to participate and those treated elsewhere were excluded from the study. Diagnosis was based on strict criteria to recognize RVPD: eruption of symmetrical vesicles or bullae on non-erythematous base, self-limited and recurrent exclusively located on palms, soles and inner sides of the fingers; and occasionally associated pruritus. Relevant investigations like skin biopsy and Mycological examination with 10 % KOH were performed. Patch test was performed with 20 allergens of Indian standard battery (Figure 1) on the patients' back for 48 hours. Readings were taken at 48 and 120 hours. Test readings followed recommendations of the International contact dermatitis research group (questionable reaction, soft erythematous macule (+/-); weak/nonvesicular reaction, with erythema, infiltration and papule (+); strong/nonvesicular reaction, with erythema, infiltration and papules (++); reaction with confluent bullae (+++); negative reaction (-); irritant reaction (IR). Data were collected using questionnaire. Details included sex, age, seasonal variations, hyperhidrosis, individual and family history of atopy, atopic diathesis were included. Diagnosis of atopic status was defined by individual or family history (allergic rhinitis, asthmatic bronchitis and atopic eczema). Ethical approval was obtained from research ethics board. Data were entered in IBM SPSS Statistics 21 for Windows (IBM Corp. 1995, 2012). Descriptive statistics such as frequency, percentages, mean with standard deviation and median were used. Analysis was done using Chi-square test to check the significance between proportion and p value <0.05 was taken as statistically significant.

RESULTS

Majority (44%) of patients were in the age group 1-5 years (Table 1). In 78% of patients no causative factor were identified. Hyperhidrosis (12%) was identified as second most contributing factor for RVPD (Figure 2). Patch test results were positive for nickel, potassium dichromate and benzocaine in 3 patients out of total 50 patients in whom patch test was conducted. Atopy was the most common associated factor (Figure 3). Personal history of atopy was present in 42% of the patients with allergic rhinitis/sinusitis, bronchial asthma and atopic dermatitis in 57.14%, 28.5% and 14.2% respectively (Table 2). Family

history of atopy was also present in 26% of them as allergic rhinitis/sinusitis (69.2%) and bronchial asthma (30.7%).

Table 1: Age distribution of the patients.

Age range (years)	N	%
1-5	22	44
6-10	16	32
11-15	9	18
16-18	3	6

Table 2: Atopy history.

Atopy history	N	%
Personal history of atopy	Present	21 42
	Allergic rhinitis/sinusitis	12 57.1
	Atopic dermatitis	3 14.2
	Bronchial asthma	6 28.5
	No atopy	29 58
Family history of atopy	Present	13 26
	Allergic rhinitis/sinusitis	9 69.2
	Atopic dermatitis	0 0
	Bronchial asthma	4 30.7
	No atopy	37 74



Figure 1: 20 contact allergens of Indian standard battery.

Majority of patients had onset of symptoms before 6 years of age with 50% having more than one recurrent episode. Majority (70%) of patients had symptoms for less than 1 month duration. Itching (52%) was the predominant symptom followed by itching with peeling (20%) (Figure 4). Palms alone (64%) were affected in majority of patients followed by palmoplantar involvement (26%) (Figure 5).

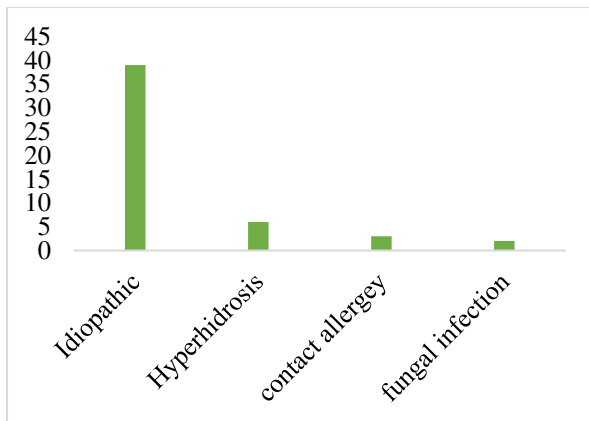


Figure 2: Aetiology of RVPD.

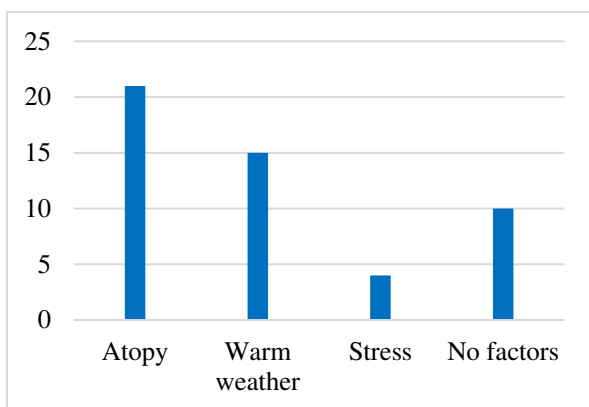


Figure 3: Associated factors in RVPD.

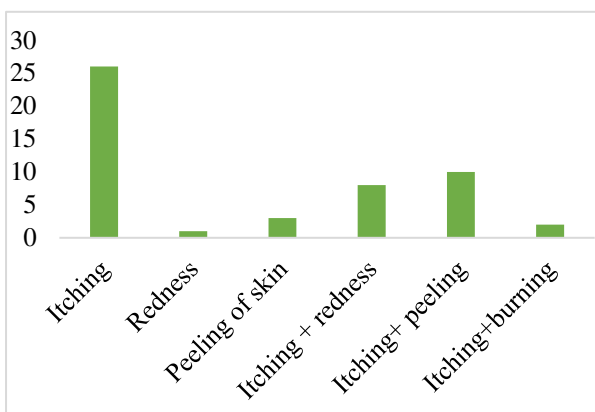


Figure 4: Symptoms of RVPD.

Vesicular lesions were the most common presentation and bullae were uncommon. Majority of patients had vesicle arranged in groups (80%) with lateral localization (82%) and bilaterally symmetrical arrangement of vesicles (82%).

DISCUSSION

Recurrent vesicular palmoplantar dermatitis (RVPD) is characterized by non-inflammatory vesicular eruptions strictly limited to palms and soles.⁷ Aetiology of the

condition remains obscure. Like other forms of eczema, it also causes a decline in the quality of life rather than impacting survival.

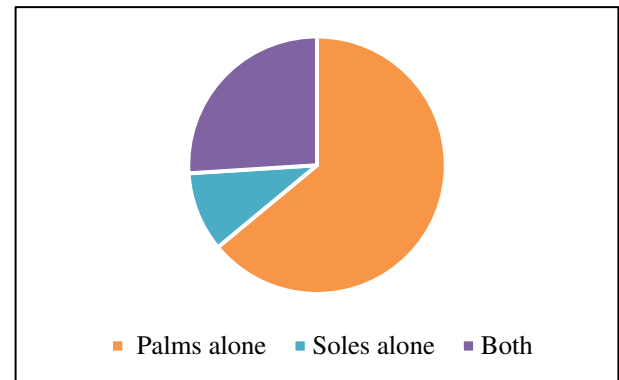


Figure 5: Sites involved in RVPD.



Figure 6: Patch test units applied over back.



Figure 7: Reading done after 48 hours showing grade 2 positive reaction to allergen7- Nickel sulphate.

Majority of patients in the present study belonged to younger age group of 1-5 years, in contrast to the study by Scotelaro et al who reported an average age of 8.4.¹ Earlier studies that assessed larger number of patients, had not reported cases under 10 years.^{2,8-10} No definite etiological

factor was identified in 78% of patients. Idiopathic nature was more evident in age group of 1- 5 years.

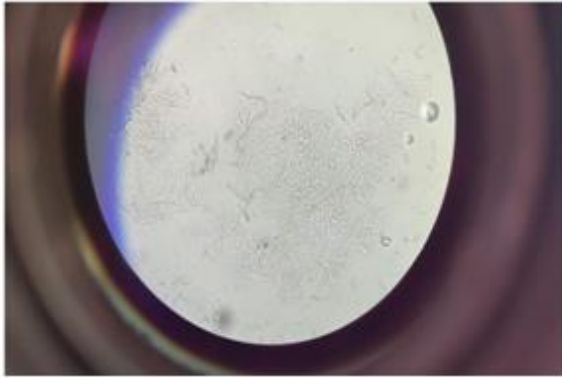


Figure 8: Dermatophyte KOH examination under microscope.



Figure 9: Vesicles on palms.



Figure 10: Deep seated vesicles on plantar aspect.

In minority (22%) of patients belonging to older age groups hyperhidrosis, contact allergens and dermatophytosis were identified. Hyperhidrosis was an important finding in only 6 patients, however other studies reported more number of cases with hyperhidrosis.^{1,2,8,12,13} Higher rate of sweating activates the release of cytokines that elicit local inflammatory reaction producing vesicles and bullae.¹⁴ Three patients developed mild positive patch test reaction with nickel, benzocaine and potassium bichromate in each one respectively (Figure 6-7). These findings were in contrary to most of the studies done in RVPD in which nickel sulphate was the most common allergen.^{8,12,13} The study could not identify contact allergens in most of the cases might be due to the fact that frequency of sensitization are decreased in paediatric age groups. Avoidance of offending allergen have been found to decrease the recurrence of RVPD. Dermatophyte infection was identified as a causative factor in 4% patients supporting the fact that incidence of tinea pedis and mannum in children are rare (Figure 8).^{15,16} In variance to that some studies having wide age range (7-72 years with mean of 35) reported more number of dermatophytic infections.^{2,11} Atopy, seasonal exacerbation in warm weather, and stress were identified as important associated factors. Personal history of atopy was present in 21 patients (42%) similar to other studies.^{1,12,17} Atopy was in the form of allergic rhinitis and sinusitis (57.14%) in majority and family history of atopy was present in 26% of them who had personal history of atopy. Those patients with atopy history never presented with signs of active atopic eczema at the time of examination. Few studies showed active atopy at the time of examination and suggested RVPD as a manifestation of atopic palmoplantar dermatitis.^{2,8,18} Thirty percentage of the patients in the study reported exacerbations in warm weather in conformity with other studies.^{1,13} Due to the smaller age group in the study seventy percent had symptom duration of less than 1 month. In variance to that study which included larger age groups, symptom duration were for more than 6 months.¹⁹ Majority (52%) had itching as the main symptom followed by itching with peeling. Palmar involvement alone was the most common presentation (64%) similar to other studies.^{2,12,20} Palmoplantar lesions were present in 26% and a minority of patients presented with plantar lesions alone similar to other studies (Figure 9-10).^{1,12} Deep seated vesicles appearing in groups was the most common presentation both in palms and soles. Bilaterally symmetrical distribution over lateral aspect of palm and fingers or toes was the commonest presentation similar to other studies.^{1,13}

Limitations

Limitation of current study was an inferential causal relationship could not be obtained from the results due to the cross-sectional design of this study and small sample size.

CONCLUSION

Though, recurrent vesicular palmoplantar dermatitis (RVPD) is benign and chronic disorder which affects the older age groups mainly, younger children also affected equally. A definite etiology remains elusive, however hyperhidrosis, contact allergens and dermatophytoses has to be considered, necessitating the need of future studies with larger sample size. In patients with definite history of atopy RVPD could be a phenotypic manifestation of atopic dermatitis. Bilaterally symmetrical grouped vesicular eruption over centrifugal areas and lateral sides of palm or soles or both was the major presentation in this study group.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Scotelaro HG, Fernandes NC, Ramos-e-Silva M. Clinical profile of recurrent vesicular palmoplantar dermatitis in children and adolescents. Clin Cos Invest Dermatol. 2019; 12(1):23-8.
- Guillet MH, Wierzbicka E, Guillet S, Dagregorio G, Guillet G. A 3-year causative study of pompholyx in 120 patients. Arch Dermatol. 2007;143(12):1504-8.
- Chen JJ, Liang YH, Zhou FS, Yang S, Wang J, Wang PG, et al. The gene for a rare autosomal dominant form of pompholyx maps to chromosome. J Invest Dermatol. 2006;126(2):300-4.
- Lee CS, Lim HW. Cutaneous diseases in asians. Dermatol Clin. 2003;21(4):669-77.
- Wollina U. Pompholyx. Am J Clin Dermatol. 2010; 11(5):305-14.
- Nagarajan K, Thokchom NS, Ibochouba K, Verma K, Hafi NB. Pattern of paediatric dermatoses in Northeast India. IJPD. 2017;18(4):286.
- Fox T. Clinical lecture on dysidrosis: an undescribed eruption. Br Med J. 1873;2(665):365.
- Lodi A, Betti R, Chiarelli G, Urbani CE, Crosti C. Epidemiological, clinical and allergological observations on pompholyx. Contact Dermat. 1992;26(1):17-21.
- Hutchinson J. Cheiro-Pompholyx. Br Med J. 1878; 1(889):54.
- Agrup G. Hand eczema and other hand dermatoses in South Sweden. J Occup Environ Med. 1970;12(2):59.
- Meneghini CL, Angelini G. Contact and microbial allergy in pompholyx. Contact Dermatitis. 1979; 5(1):46-50.
- Jain VK, Aggarwal K, Passi S, Gupta S. Role of contact allergens in pompholyx. J Dermatol. 2004;31(3):188-93.
- Christensen OB, Möller H. Nickel allergy and hand eczema. Contact Dermat. 1975;1(3):129-35.
- Meding B, Swanbeck G. Epidemiology of different types of hand eczema in an industrial city. Acta Derm Venereol. 1989;69(3):227-33.
- Lofgren SM, Warshaw EM. Dyshidrosis: epidemiology, clinical characteristics, and therapy. Dermatitis. 2006;17(4):165-81.
- Weston JA, Hawkins K, Weston WL. Foot dermatitis in children. Paediatr. 1983;72(6):824-7.
- Lehucher MP, Koeppel MC, Lanteaume A, Sayag J. Dyshidrotic eczema and occupation: a descriptive study. Contact Dermatitis. 2000;43(4):200-5.
- Oddoze L, Temime P. Dyshidrosis and atopy. 2nd note: atopic component in dyshidrosis. Bull Soc Dermatol Syphiligr. 1968;75(3):378-80.
- Agrup G. Hand eczema and other hand dermatoses in South Sweden. J Occup Environ Med. 1970;12(2):59.
- Fredricks MG, Becker FT. Vesicular eruptions of the hands and feet of dyshidrotic type: clinical and therapeutical analysis. AMA Arch Derm Syphilol. 1954;70(1):107-14.

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