ORIGINAL ARTICLE

Management of eczema herpeticum in a Burn Unit

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Abstract

Objective: To study the clinical features, course and outcome of eczema herpeticum in burn patients.

Methods: This prospective study was conducted at the King Edward Medical University / Mayo Hospital, Lahore, Pakistan, from November 2012 to October 2015, and comprised eczema herpeticum patients. Demographic and clinical features of the patients, treatment protocols and outcomes were noted. SPSS 18 was used for data analysis.

Results: Of the 18 patients, 10(56%) were females and 8(44%) were males. The overall mean age was 29.17±8.36 years. The mean total body surface area burnt was 30.83±8.58%. Besides, 7(39%) patients had 2nd degree burns and 11(61%) had both 2nd and 3rd degree burns. There was no history of previous skin disease. Moreover, 4(22%) patients had diabetes and 6(33%) were smokers. The mean difference between the occurrence of fever and the appearance of skin lesions was 4.44±1.46 days. The overall mean temperature was 102.22±1.06 oF. The mean duration between the eruption of skin lesions and crusting of lesions was 4.38±1.26 days. Areas involved with skin lesions were trunk in 13(72%) patients, arms 12(67%), thigh 10(56%) and face in 4(22%) patients. Also, 2(11.1%) patients developed acute respiratory distress syndrome. Tzanck test showed multi-nucleated giant cell in all patients. The mean number of days since the eruption of lesions and the settling of fever was 5.56±0.73 days. The mean duration for complete healing, which occurred in 16(89%) patients, was 3.81±0.75 weeks. The overall mean follow-up period was 15±2.03 months.

Conclusion: Eczema herpeticum may occur in a burn patient and should never be missed as early diagnosis will lead to a better outcome.

Keywords: Eczema herpeticum, Burns, Herpes simplex, Tzanck smear, Acyclovir. (JPMA 66: 1357; 2016)

Introduction

Eczema herpeticum (EH) is an extensive vesicular eruption of skin also known as Kaposi varicelliform eruption. It is caused by the herpes simplex virus (HSV) type 1 or type 2.[1] EH has been diagnosed in some pre-existing inflammatory skin diseases such as atopic dermatitis, Hailey-Hailey disease, psoriasis, eczema, contact dermatitis, seborrhoeic dermatitis, and in patients with burns. Burn leads to a defective skin barrier and impaired immunity due to which the burn patient becomes prone to infections and this may lead to the development of eczema herpeticum.[2-4]

EH is characterised by disseminated vesiculopustules and erosions. Fever and lymphadenopathy is mostly associated with EH. Lesions develop in areas with impaired skin barrier and in a few days spread to involve normal skin areas. The disease may lead to multiple organ failure and death.[4,5]

The diagnosis is confirmed by viral culture, direct immunofluorescence, polymerase chain reaction (PCR) or by skin cytology using Tzanck test. Patients are managed in an intensive care unit (ICU) setting and along with a rigorous burn management they are given high doses of antiviral drugs, mostly acyclovir or valcyclovir combined with systemic antibiotics.[6,7]

There are few studies available describing characteristics and management of EH, especially in burn patients. The current study was planned to examine the clinical features, course and response to specific antiviral treatment during the episode of eczema herpeticum in burn patients.

Patients and Methods

This prospective study was conducted at the Department of Plastic Surgery, Burn Unit at the King Edward Medical University (KEMU) / Mayo Hospital, Lahore, Pakistan, from November 2012 to October 2015, and comprised EH patients. Patients who were diagnosed clinically by burn unit staff and confirmed by a consultant dermatologist were included.

Variables reviewed were patient characteristics (including age, percentage of burn, depth of burn), co-morbidities such as diabetes mellitus (DM), hypertension (HTN), skin disease, potential risk factors (smoking, immunosuppressant or herbal medications), characteristics of EH (symptoms i.e. fever, pain, and signs

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i.e. skin lesions, temperature, acute respiratory distress syndrome [ARDS] and duration of illness), treatment protocols and complete healing time.

Treatment was started as soon as clinical diagnosis was made. Antiviral treatment advised was oral acyclovir 400mg 5 times a day, intravenous (IV) acyclovir at 15mg/kg/day was prescribed for high-risk patients with co-morbidities, whereas some of the patients were prescribed valcyclovir. After 10 days of aggressive treatment, oral acyclovir (400mg) three times a day was continued till complete healing. Broad-spectrum antibiotics were started empirically and shifted to narrow-spectrum after culture and sensitivity. For pain relief, patients were given Nalbuphin 0.2 mg/kg I/V thrice daily. Tzanck smear (scraping taken from base of fresh blister to see presence of multi-nucleated giant cells) was sent to confirm diagnosis in all suspected patients.

Data was analysed using SPSS 18. Qualitative data like gender, type of burn and co-morbidities were presented as frequency and percentage. Quantitative data like age, duration of illness, and healing time of skin lesions and complete burn were presented as mean and standard deviation (SD).

Results

Of the 430 patients admitted to the burn unit during the study period, 18(4.2%) developed EH. Of them, 10(56%) were females and 8(44%) were males. The mean age of the patients was 29.17±8.36 years (range: 14-43 years). Total body surface area (TBSA) burnt was between 20-30% in 10(56%) patients, 30-40% in 4(22%) patient and 40-50% in 4(22%) patients. The mean TBSA burnt was 30.83±8.58%. Besides, 7(39%) had 2nd degree burns (superficial and deep partial thickness wound) and 11(61%) had mixed thickness burns (2nd and 3rd degree burns). None of the patients gave past history of any skin disease. Also, 4(22%) patients had diabetes, 7(39%) had hypertension and 6(33%) were smokers.

The first symptom recorded was fever, characterised as raised body temperature more than 98.6°F. In 13(72%) patients, fever developed 3-5 days before the appearance

Table: Demographics and progress of lesions.

Patients	Age	%TBSA	BD	FVR1	T°F	AI	C	FVR2	WK	FL	OC
M1	35	34	2,3	5	102	T,L	5	5	4	16	H
M2	17	21	2	3	103	U,F	3	5	5	14	H
M3	27	27	2,3	4	103	T,L	4	6	4	16	H
M4	30	33	2,3	4	101	T,U	5	7	3	17	H
M5	29	25	2	3	104	U,L	6	5	5	15	H
M6	32	44	2,3	6	102	T,U,L	-	-	-	-	D
M7	18	28	2,3	5	102	T	4	5	4	13	H
M8	43	36	2,3	7	101	T,U	5	6	3	12	H
F1	14	23	2	3	102	T,U	3	5	4	16	H
F2	40	29	2,3	4	102	T,U	3	5	4	13	H
F3	26	41	2,3	5	103	T,U,L	4	6	5	17	H
F4	33	24	2	3	104	U,L,F	7	6	4	13	H
F5	19	36	2,3	6	100	T	5	5	3	18	H
F6	37	42	2,3	6	101	T,U,L	3	7	3	16	H
F7	38	20	2	3	102	T,L	4	5	3	18	H
F8	24	22	2	3	103	U,F	3	5	3	12	H
F9	28	23	2	3	103	L	6	6	4	14	H
F10	35	47	2,3	7	102	T,U,L,F	-	-	-	-	D
Mean (SD)	29.17 (8.36)	30.83 (8.58)		4.44 (1.46)	102.22 (1.06)		4.38 (1.26)	5.56 (0.73)	3.81 (0.75)	15 (2.03)	

M: Male, F: Female
BD: Burn depth in degrees (1 = 1st degree, 2 = 2nd degree, 3 = 3rd degree, 4 = 4th degree)
FVR1: No. of days fever started before the eruption of lesions
AI: Area involved (T = trunk, U = upper limb, L = lower limb, F = face)
C: No. of days to crusting of lesions
FVR2: No. of days after which fever settled after lesion eruption
WK: No. of weeks in which lesion healed
FL: Follow-up of patients in months
OC: Final outcome (H = healed, D = deceased)
TBSA: Total body surface area
SD: Standard deviation.

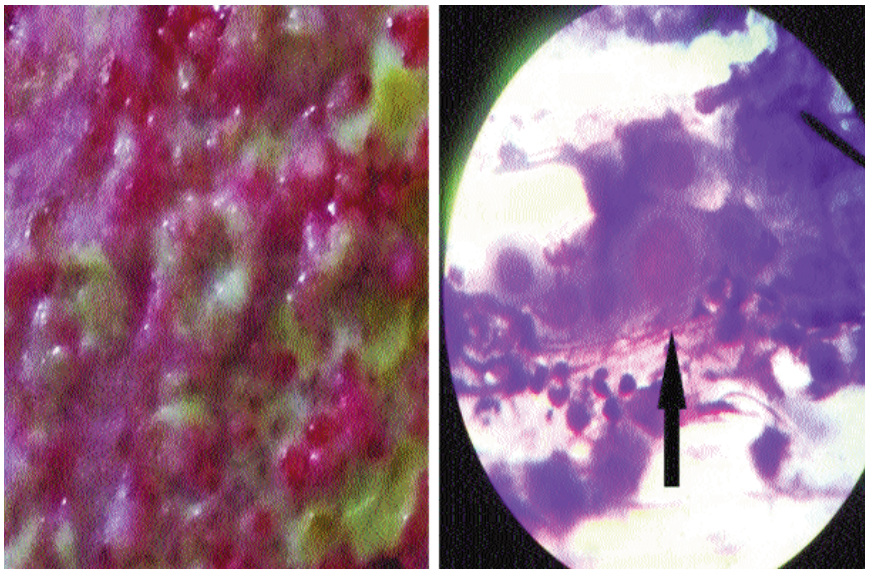

Figure-1: -right == vesicles with central umbilication, left=multinucleated giant cells seen on TZANK smear test.

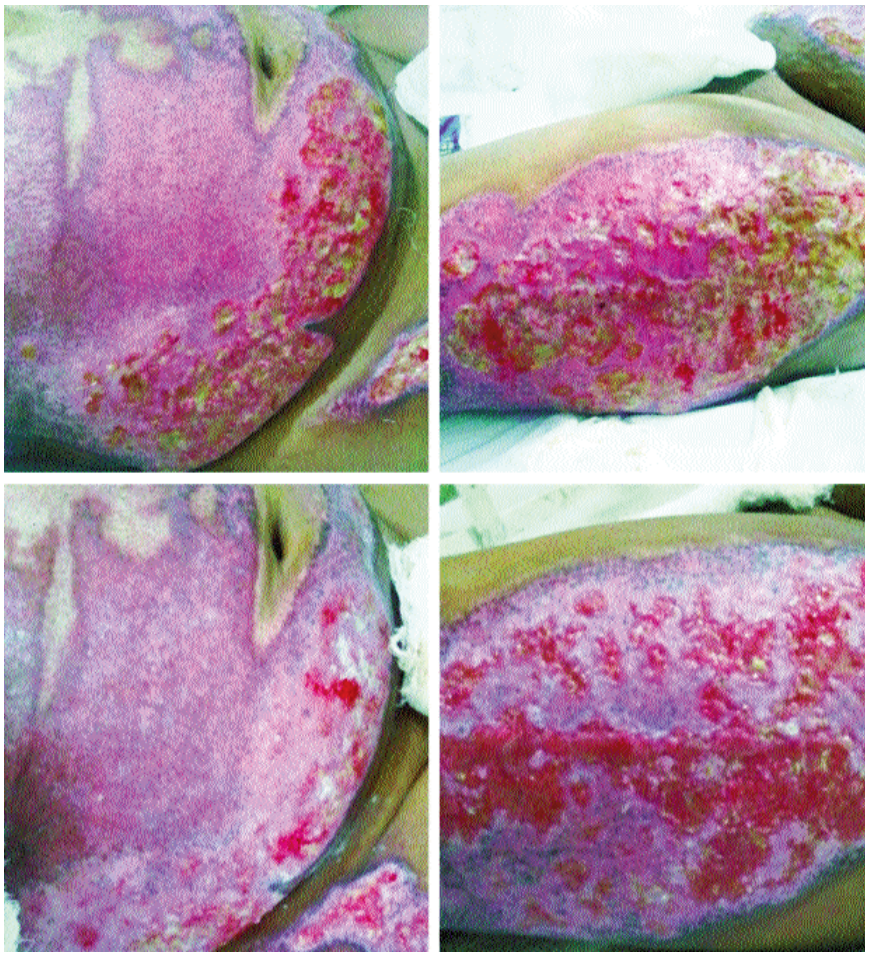

Figure-2: -right upper==patient with monomorphic vesicles with central umbilication on trunk, right lower==healed lesions after treatment, left upper ==another patient with lesions on left thigh, left lower == healed lesions after treatment.

of skin lesions and 6-7 days before in 5(28%) patients. The mean difference between the occurrence of fever and the appearance of skin lesions was 4.44±1.46 days. Temperature was high i.e. >102°F in 14(78%) patients and low in 4(22%) patients. The overall mean temperature was 102.22±1.06°F. All patients developed fluid-filled monomorphic vesicles which showed central umblication and crusting in next 3-5 days in 13(72%) patients and 6-7 days in 3(17%) patients. Moreover, 2(11%) patients expired before crusting could occur. The mean number of days to crusting was 4.38±1.26. Areas involved with vesicles were trunk in 13(72%) patients, followed by arms 12(67%), thighs 10(56%) and face in 4(22%) patients. Besides, 2(11.1%) patients developed ARDS. Tzanck smear test showed multi-nucleated giant cell in all the 18(100%) patients (Figure-1).

Fever settled down on 5th day in 11(61%) patients, 6th day in 5(28%) and 7th day in 2(11%) patients, with a mean duration of 5.56±0.73 days. Skin lesions healed in 3 weeks in 6(33%) patients and in 7(39%) in 4th week while 3(17%) showed healing on 5th week after appearance; the mean duration was 3.81±0.75 weeks (Figure-2). Complete healing occurred in 16(89%) patients while 2(11%) expired. None of these patients developed a second attack. The mean follow-up period was 15±2.03 months (range: 12-18 months) (Table).

Discussion

Wound infections are a major cause of morbidity and mortality in burn injury patients who have been managed successfully through the initial resuscitation. This is due to the immunological abnormality and impaired barrier function of skin.[8]

Moriz Kaposi described EH in 1887 as chicken pox-like skin lesions which are usually superimposed on an underlying skin condition. Later in 1941, HSV was suggested as the primary cause of

disease by Sedenberg. Different studies mentioned that primary harbouring of HSV through close contact may be a source of EH. However, some studies mentioned that it occurs due to reactivation of HSV (secondary infection).[6,9,10] We were able to identify possible source only in 4 patients

Many studies have mentioned association of fever (low to high grade) with skin lesions usually before eruption of lesions.[10] In our study, all patients developed fever 4-7 days (mean: 4.44±1.46 days) before the eruption of skin lesions and 78% having high grade >102ºF.

Nath et al.[10] and many other studies have mentioned the lesions of EH as distinctly monomorphic eruption of dome-shaped vesicles forming into erosions or pustules in a few days. Some atypical variant with disseminated lesions and intense erythematous plaques were also described.[6-10]

In our study we found that the burn patients developed fluid-filled monomorphic vesicles with later central umbilication. After searching the literature and considering our own findings, we strongly believe that sudden appearance of fluid-filled monomorphic lesions on burn area with later central umbilication along with unexplained fever could be a sign of EH.

Patients of EH may develop lesions over the head, neck, trunk, and lower and upper limbs. Mostly, lesions start appearing on skin with impaired barrier and spreading to involve normal skin. Ocular involvement may lead to keratoconjunctivitis, keratitis or uveitis.[11] We also found trunk, arms, thighs and face to be the commonly affected body parts; however, eyes remained safe.

In literature, many investigations such as polymerase chain reaction, electron microscopy, immunofluorescence, Tzanck test (skin cytology), viral culture and serological tests have been mentioned to confirm or support the clinical diagnosis of EH. Most often used quickest and simplest method described is Tzanck test with sensitivity > 80%. Confirmation is done by the presence of multi-nucleated giant cell which may contain inclusion bodies. The presence of acantholytic cells in upper layer of skin adds in confirmation.[12] In our study, Tzanck smear test was done in all the patients suspected of having EH and the histopathology showed the presence of multi-nucleated giant cells in all cases.

Apart from burns, EH has been reported in patients with pre-existing skin disease such as atopic dermatitis, mycosis fungoides, Hailey-Hailey disease, seborrhoeic dermatitis, staphylococcal scalded skin syndrome (SSSS) and psoriasis. However, in our study, EH occurred in burn patients with no history of any skin disease.[3,13,14]

Some studies have shown that systemic corticosteroids, topical tacrolimus, cyclophophamide, and azathioprine may be associated with occurrence of EH.[7,10,15,16] In our study, none of the patients were previously on any form of immunosuppression.

Many studies have mentioned that EH may become generalised and progress to severe life-threatening infection. Multiple organ involvement may lead to death.[6,15] In our study, two patients diagnosed with EH developed multiple organ failure and died. The deaths were possibly due to a more severe burn coupled with severe eczema which was diagnosed late causing a delay in the start of antiviral treatment.

Various studies have shown that acyclovir is treatment of choice and will treat the lesions of EH in most patients. A systemic antibiotic is usually added to control heavy bacterial infection. A few studies have stated that EH may recur.[10,13,15-17] In our study, acyclovir and valcyclovir were used to treat patients in higher doses for 10 days after which oral acyclovir in a dose of 400 mg three times a day was continued till complete healing of burn wounds. No recurrence of EH occurred in our patients after resolution of the disease during the follow-up period.

Like any other contagious disease, EH requires application of preventive measures to avoid an outbreak. As described in literature, we also applied strict barrier and decontamination measures to prevent future outbreaks in our burn unit.[15,18,19] Infected patients were isolated to a separate room and their dressings were done on bedside using sterile gloves and dressing materials. Contaminated grabs and linen were removed immediately. Appropriate hand-washing and change of gloves contaminated with patient secretions or excretions were also performed before touching another patient. Hand disinfection dispensers were fitted along each bed. Surgical instruments were decontaminated and sterilised before reuse. Attendants and health care providers having nosocomial infection were not allowed to nurse burn patients. All health care providers wore clean face masks and gowns. Routine cleaning and decontamination of beds, side tables, surface and equipment like blood pressure cuff, thermometer, wheel chair, IV stands and hydrotherapy areas was performed. Currently, prophylactic antiviral drugs were prescribed to all new patients admitted to burn unit and fumigation was performed on a quarterly basis.

A limitation in our study was that PCR and immunoflourescence were not available and only Tzanck

test was used. Also we had no set protocol for choosing the antiviral medication and patients were advised according to the prescription of our dermatologist. Further studies are needed to compare the antiviral drugs with each other in burn patients developing EH to assess efficacy of antiviral drugs. Another limitation of our study was that we did not have paediatric patients at our burn unit.

Conclusion

Eczema herpeticum can occur in a burn patient and should always be remembered while managing burns. EH is a clinical diagnosis supported by Tzanck smear and should never be missed as early diagnosis will lead to a better outcome. Prompt and rigorous treatment of burn along with antiviral drugs should be started as soon as diagnosis is established clinically which will lead to an early resolution of disease.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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