Original Research Article

Histopathological study of non-infectious vesiculobullous lesions of skin

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Abstract

Background: Skin is the largest organ of the body and some bullous disease are of skin are non-infectious in origin. There is a need to study the clinical, histopathological and immunology of different non-infectious vesiculobullous lesions of the skin.
Materials and methods: A cross sectional study included a total of seventy two patients diagnosed with non-infectious vesiculobullous lesions and drug eruptions. All the patients were subjected for detailed clinical history, general and local examination. Ideal lesion site were chosen with intact vesicle or bulla. Tzank smear was prepared before the biopsy wherever possible.
Results: Majority of the study subjects in this study were aged between 41 – 50 years, males and had lesions for less than a week. About 34.7% of the lesions were vesiculobullous type of lesions, 33.3% were bullous lesions and 31.9% were vesicles. The mucosal involvement was present in 41.7% of the cases. Back was the site of appearance of lesions for the first time in 43.1% of the cases and affected suprabasal layer. Pemphigus vulgaris was the common lesion in this study. Acanthocytes and acanthocytes with neutrophils were found in Pemphigus vulgaris.
Conclusion: A thorough clinical examination with definitive histopathological correlation of blistering lesions is required for the definitive diagnosis.

Key words

Non-infectious, Vesiculobullous lesion, Skin, Histopathology.

Introduction

Skin is largest organ in the body and offers protective covering and is often a part of the specialized immune apparatus of the body. The immune disturbances in the body are often reflected in the skin when compared with other organ systems of the body. But this organ can be easily accessed by biopsy. Histopathology of the skin biopsies supplemented with special techniques including direct immunofluorescence is a useful technique in the investigation different skin disorders, of which vesiculobullous lesions forms prominent group.

Vesicles (blister < 0.5 cm in diameter) and bullae (blister > 0.5 cm in diameter) occur in number of skin conditions [1]. These blistering disorders are visually dramatic and shares distinct clinical features but only some extent has pathogenic mechanisms. Bullous pemphigoid and pemphigus vulgaris are autoimmune in nature but other like epidermolysis bullosa is inherited in nature and caused by non-immunologic mechanisms [2]. The histological study of the vesiculobullous lesions are addressed by very few studies in India. Histological studies are the valuable means of diagnosis in dermatology. The greatest diagnostic accuracy is obtained by correlating the clinical and histological findings [2]. The pathological evaluation involves systemic analysis, which includes blister separation planes, the mechanism of blister formation, character of inflammatory infiltrate and type of immune deposits including the presence or absence of it.

This study was mainly undertaken to study the clinical, histopathology and immunology of different non-infectious vesiculobullous lesions of the skin.

Materials and methods

A cross sectional study was undertaken in the department of Skin and STD, among patients with vesicles or bullous lesions. These lesions were biopsied and samples were submitted to the Department of Pathology for detailed histopathology and immunofluorescence examination.

All the patients presenting with non-infectious vesiculobullous lesions including drug eruptions presenting to the department of skin and STD during the study period were included in to the study. The patients with genetic blistering diseases, bullous lesions due to physical, chemical, biological, metabolic factors and eczemas.

A total of seventy two patients diagnosed with non-infectious Vesiculobullous lesions and drug eruptions were included in to the study. An informed, bilingual consent was obtained from all the patients before biopsy and clearance from institutional ethics committee was obtained before the study was started. All the patients were subjected for detailed clinical history, general and local examination. Ideal lesion site were chosen with intact vesicle or bulla. Tzank smear was prepared before the biopsy wherever possible. Two biopsies were obtained from each patient and one is sent in 10% formalin for histopathology and other in Michel's medium for DIF.

Under local anesthesia, skin biopsies were taken using punch biopsy needles of 3 mm to 5 mm diameter or excisional biopsy was performed. One biopsy was of the lesions intact vesicle or bullae and second biopsy from perilesional site (few mm to 1 cm from the lesion preferably uninvolved skin). Intact vesicle or bulla was preserved in 10% buffered formalin and subjected for processing. The perilesionsal skin biopsy was preserved in Michel's medium for immunofluorescence study.

The sections were studied under fluorescent microscope OLYMPUS – UCMAD – 3, Prog ResCT3. The intensity of the fluorescent pattern in each specimen was graded as negative or positive. In negative fluorescence, no observable pattern with greater intensity than the background fluorescence was noted. Positive fluorescence was defined as a pattern clearly and

consistently above the background intensity and present throughout the specimen.

The data thus obtained was analyzed by using Statistical Package for Social Services (vs 20). The data was analyzed using appropriate descriptive and inferential statistics.

Results

23.6% of the study subjects were aged between 41 – 50 years and 22.2% belonged to 11 – 20 years of age group. Males outnumbered females in this study. About 34.7% of the lesions were of less than 1 week (**Table – 1**).

About 34.7% of the lesions were vesiculobullous type of lesions, 33.3% were bullous lesions and 31.9% were vesicles. The mucosal involvement was present in 41.7% of the cases. Back was the site of appearance of lesions for the first time in 43.1% of the cases. About 51.4% of the lesions were supra basal layer (**Table – 2**).

Table – 1: Socio-demographic pattern of the study subjects.

Socio demographic characteristics		**Frequency**	**Percentage**
Age group	**Less than 10 years**	4	5.6
	11 – 20 years	16	22.2
	21 – 30 years	14	19.4
	31 – 40 years	4	5.6
	41 – 50 years	17	23.6
	51 – 60 years	12	16.7
	More than 60 years	5	6.9
Sex	**Male**	39	54.2
	Female	33	45.8
Duration of the lesion	**Since birth**	10	13.9
	Less than 1 week	25	34.7
	1 week – 1 month	22	30.6
	1 month – 6 months	12	16.7
	6 months – 1 years	3	4.2
Total		72	100

Table – 2: Distribution of the study subjects according to characteristic of the lesion.

Characteristics of the lesion		**Frequency**	**Percentage**
Type of lesion	**Vesicle**	23	31.9
	Bullous	24	33.3
	Vesiculobullous	25	34.7
Mucosal involvement	**No**	42	58.3
	Yes	30	41.7
Site of appearance	**Arms**	11	15.3
	Back	31	43.1
	Knee	3	4.2
	Leg	4	5.6
	Scalp	7	9.7
	Trunk	16	22.2
Level of blister	**Supra basal**	37	51.4
	Supra epithelial	35	48.6

Table – 3: Distribution according to histopathology examination and contents of the lesion.

HPE	Acanthocytes	Acanthocytes - Neutrophils	Neutrophils	Nil	Total
Bullous pemphigoid	8 (26.7)	8 (34.8)	2 (100)	7 (41.2)	25 (34.7)
Pemphigus foliaceous	2 (6.7)	1 (4.3)	0	1 (5.9)	4 (5.6)
Pemphigus vulgaris	18 (60.0)	13 (56.5)	0	8 (47.1)	39 (54.2)
Steven Johnson syndrome	2 (6.7)	1 (4.3)	0	1 (5.9)	4 (5.6)

Pemphigus vulgaris was the common lesion in 54.2% of the cases followed by Bullous pemphigoid in 34.7% of the cases on histopathology examination. Acanthocytes and acanthocytes with neutrophils were commonly found in Pemphigus vulgaris (**Table – 3**).

Discussion

The present study was mainly undertaken to study the histopathology of the non-infectious vesiculobullous lesions of the skin. Immunobullous (blistering) are autoimmune diseases of the skin. The autoimmune conditions involves attacking of the own organs or tissues by the autoantibodies. Some types of protein attach the epidermal cells to dermis which keeps the skin intact. Autoantibodies damage the cells and separates them to form blister [3]. This study had shown that, Pemphigus vulgaris and bullous pemphigoid were the two non-infectious vesiculobullous disorders. In a study by Rizvi et al, the pemphigus vulgaris was found in 32.25% of the cases and Bullous pemphigoid was found in 27.42% of the cases [4]. Daneshpazhooh, et al. had reported pemphigus vulgaris in 81.2% of the cases and bullous pemphigoid in 11.6% of the cases [5]. Khan, et al. noted pemphigus vulgaris in 33.33% of the cases and Pemphigus foliaceous in 30.3% of the cases [6].

Rizvi, et al. had shown that, the age incidence of bullous pemphigoid is 58.37 years with 2.4:1 male to female ratio [4]. Khan, et al. had shown an age incidence of 60 years with 1:1.5 years of male to female ratio [6]. Trunk and extremities are commonly involved in almost 90% of the cases. Bulla is the primary lesion all the cases [7].

The mean for the pemphigus vulgaris was found to be 40 to 41 years as per the studies done by Rizvi, et al. and Khan, et al. [4, 6]. The common site of involvement was generalized followed by face and scalp in a study by Arya, et al. [8]. The blister is suprabasal with predominant acanthocytes and neutrophils [8].

Rizvi, et al. and Khan, et al. have reported that, the mean age of incidence of Pemphigus foliaceous is around 40 years [4, 6]. The distribution is generalized in nature followed by scalp and extremities and mucosal involvement was common [8].

The Steven Johnson syndrome was common in first to second decade of life and extensive mucosal involvement including conjunctiva and esophagus was reported by Harr, et al. [9]; Nassif, et al. [10] had reported that the keratinocyte apoptosis followed by necrosis is the pathogenic basis of the widespread epidermal detachment observed in SJS.

Conclusion

A thorough clinical examination and definitive histopathological correlation of blistering lesions are required for the definitive diagnosis.

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