CYTODIAGNOSIS IN CONTACT DERMATITIS

PAVITHRAN K.*

Summary

The role of cytology in the diagnosis and differentiation of contact dermatitis of two major types - allergic and irritant - is evaluated. Study in 10 cases of allergic contact dermatitis and 5 cases of irritant dermatitis revealed that lymphocytes were the predominant cells in cytologic smears in the allergic contact dermatitis. But the polymorphs predominated in primary irritant dermatitis. It is concluded that cytology will be of help in differentiating the two types of contact dermatitis.

KEY WORDS: Cytodiagnosis, allergic contact dermatitis, primary irritant dermatitis.

Diagnosis of the type and when feasible the cause of a pathologic process by means of microscopic study of cells in an exudate or other forms of body fluid is called cytodiagnosis[1]. In Dermatology cytodiagnosis is useful in vesiculobullous diseases and other conditions like Bowen's disease, melanoma, squamous cell carcinoma, Darier's disease, urticaria pigmentosa and paget's disease. Cytological examination is an important adjunct to routine histopathologic studies and thorough clinical evaluation of the patient's disease. All dermatologists should be familiar with the technique of taking, staining and interpreting the smears so that a diagnosis can be made without the help of a laboratory. Cytology has the advantage that several lesions can be examined, whereas biopsy is necessarily limited to one or two sites only. Clinically one diagnoses irritant dermatitis on the basis that the substance responsible is an irritant rather than an allergen, induces the reaction in all who are exposed to it if the concetration is high, has a short reaction time and causes burning sensation rather than itching. Many a time it may be difficult to distinguish clinically an allergic contact dermatitis and an irritant dermatitis. Though the mechanism of contact dermatitis has been elaborately recorded in major text books of Dermatology, the role of cytology in differentiating them has not been mentioned. Graham and Burgoon[2] are of the view that cytology has definite role in the diagnosis and differentiation of contact of the two types viz., allergic and irritant. In the present study an attempt is made to evaluate the role of this diagnostic tool - cytodiagnosis - in contact dermatitis.

Materials & Methods

Ten cases of allergic contact dermatitis, and five cases of irritant

* Assistant Professor,
Dept. of Skin & VD,
Medical College, Kottayam.

Paper presented at the Conference of IADVL, Kerala Branch held at Trivandrum on 6—3—'83.

Received for publication on 4—4—1983.

contact dermatitis which were seen in the outpatient section of Medical College Hospital, Kottayam were selected for the study. All the cases were diagnosed on clinical and historical grounds. Patch tests done with suspected allergen showed positive result in 6 out of 10 cases of allergic contact dermatitis. The agents causing the dermatitis in these cases are given in Tables 1 and 2. The lesions produced by the blister beetles were bullae, while in others vesicles and papulovesicles were the predominant lesions.

The area of dermatitis was cleaned well with normal saline avoiding rupture of the vesicles. The small, early vesicles were chosen for study. The roofs of the larger vesicles were carefully removed by scissors while those of the tiny vesicles were ruptured with sterile needles. The base of each lesion was dried by gently blotting with a gauze and then scraped with a blunt scalpel blade without producing any bleeding. The material obtained was spread as thinly as possible on a glass slide and stained with Leishman stain. Differential leucocyte count in the smears was done.

TABLE 2
Irritant Contact Dermatitis

Sl. No.	Causes	Differential leukocyte count			
		P	L	E	M
1.	Blister beetle dermatitis	74	26	0	0
2.	Blister beetle dermatitis	80	20	0	0
3.	Phenol burns	79	21	0	0
4.	40% Salicylic acid ointment	90	10	0	0
5.	1% Dithranol	89	11	0	0
	Mean ± S.D.	82.4 ± 6*88	17*6 ± 6*88	0	0

Results

The causes of contact dermatitis, results of the patch tests and the differential leucocyte count in the cytological smears are given in Tables 1 and 2.

Discussion

There are two types of dermatitis caused by substances coming in contact with the skin. They are allergic contact dermatitis (ACD) and primary irritant dermatitis (PID). The PID is a nonimmunological reaction in the skin resulting from exposure to irritant

TABLE 1
Allergic Contact Dermatitis

Sl. No.	Cause	Differential Leucocyte Count				Patch test	
		P	L	E	M	Material	Result
1.	Foot wear-leather	12	84	0	4	Shavings	+
2.	Foot wear-leather	10	85	0	5	Shavings	—
3.	Foot wear-plastic	16	80	0	4	Shavings	+++
4.	Foot wear-plastic	18	80	0	2	Shavings	—
5.	Foot wear-rubber	9	88	0	3	Shavings	+++
6.	Watch strap-leather	13	84	0	3	Shavings	-ve
7.	Streptomycin + solution	12	80	0	8	1% Soln.	++
8.	Penicillin solution	10	89	0	1	1% Soln.	++
9.	Penicillin solution	16	82	0	2	1% Soln.	+++
10.	Spectacle frame-nickel	9	90	0	1	Not done	
		12.5	84.2	0	3.3		
	Mean ± SD	± 3 2	± 3.79		± 2.09		

substances. This type of dermatitis can be induced in any person if a sufficiently high concentration of the substance is used[3]. Acids, alkalis, detergents, organic solvents, cement etc., are the usual agents for this type of dermatitis. Cantheridine released from blister beetles, is another common cause for seasonal blistering irritant dermatitis[4]. An irritant is a substance that in most people is capable of producing cell damage if applied for sufficient time and in suffiicient concentration. The eczematous dermatitis begins to develop within a few hours after the first exposure to chemical. Many irritants induce damage by gradually exhausting the horny layer, denaturing the keratin and altering the water holding capacity. Allergic contact dermatitis on the other hand is mediated by type IV hypersensitivity reaction where T lymphocytes take important role. Second exposure to the antigen, in a sensitised individual causes reflux of these T cells at sites of application of antigen where these cells and their products (lymphokines) by delicate mechanisms induce inflammation and subsequent eczematous dermatitis. Contrary to this in PID the first cells to come in the exudate against the irritant are polymorphonuclear leucocytes. The present study, undoubtedly reveal that lymphocytes are the predominant type of cells in cytologic smears in ACD, whereas in PID the polymorphs predominate. The acantholytic cells, which may sometimes be seen in cytology in contact dermatitis[2] were not detected in any of the cases. The number of cases studied here are only few. More detailed study is indicated. Our limited observations suggest that cytodiagnosis will be of great help in differentiating between the two major types of contact dermatitis viz., allergic and irritant.

References :

1. Williams & Wilkins : Stedman's Medical Dictionary, The Williams & Wilkins Company, Baltimore. 1972 p 318.

2. Graham JH & Burgoon CF : Cytodiagnosis of Vesicular inflammatory dermatoses, Dermal Pathology, Graham JH, Johnson WC & Helwig EB, Harper & Row Publishers, London, 19, p 361.

3. Domonkos AN: Diseases of the Skin, WB Saunder's Company, London, 1971, p 84.

4. Bhargava RK & Gupta B; Seasonal Blistering Dermatitis, J Indian Med Association, 1982; 79 : 98-99.