

ETIOLOGY OF COMMON CONTACT DERMATITIS

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RESUME:

Contact dermatitis (allergic and non-allergic) are frequently observed dermatoses and they pose a serious problem to the dermatologist. They are usually common dermatoses, but a considerable number of the cases are occupational dermatoses. The clarification of each concrete case is of great significance for a precise therapeutic approach and efficient prophylactics.

The study aimed at etiological and pathogenetic clarification of common contact dermatitis in a group of 210 patients. The clarification was achieved through dynamic clinical study, anamnestic data, and skin tests (epicutaneous tests – chamber method). In 123 patients (58.5%) of all studied patients allergic contact dermatitis was diagnosed, and in 87 patients (41.4%) – irritant contact dermatitis.

The analysis of the received 213 positive epicutaneous tests revealed that detergents are the most frequent allergens (16.43%), followed by metals (15.02%), rubber additives (14.80%), parabens (10.79%), antiseptics (10.32%), formaldehyde (9.38%), and scents (8.92%).

The most frequent irritant etiological agents were detergents (28.73%), followed by soaps (27.58%), additives to rubber (13.79%), acids and bases, organic solvents.

Key words: allergic contact dermatitis, irritant contact dermatitis, contact allergens, contact irritants.

The common contact dermatitis cause serious problems in a dermatologist's practice. They occur frequently; they are etiopathogenetically different from the allergic contact dermatitis (ACD) – with a frequency of 54% (19), and the irritant contact dermatitis (ICD) – with a frequency of 27%(19).

The most frequent allergens, causing ACD are: nickel and other metals (7,16,20), rubber additives (16,19,20), scents (16,20), formaldehyde (19), preservatives (7), detergents (4), airborne allergens (14). The most frequent irritants, causing ICD are: soaps, detergents, alcohol and other solutions, latex particles (18), strong acids and bases, organic and non-organic salts (9).

ACD has undoubtedly allergic genesis (delayed allergic reaction), and ICD is assumed to be a non-immunologic skin irritation. The clinical occurrences, as well

as the histological pictures of ACD and ICD are actually different. In ACD histologically are presented vesiculous formations, inflammatory infiltrate and spongiosa, whereas in ICD - destruction of the corneal layers, intraepidermal necrosis (5).

The diagnostics of ACD and ICD is based on many criteria: clinical occurrences, anamnestic data of a connection of the exacerbation with concrete external noxa, clinical observation of the dynamics and laboratory tests. The test methods accentuate on epicutaneous testing with a standard line and additional lines of allergens (1). Several authors recommend histological differentiation between ACD and ICD (5). There are also newer non-invasive in vivo methods for diagnostics of CD (3).

There exists a complex interrelation between ACD and ICD – the irritant dermatitis or the mere skin irritation predisposes with long exposure to allergization (9) or the eventual transformation of the dermatitis from a common type into an occupational one. This requires that the initial diagnostics for each separate case should be precise and etiologically determined, and that - besides the treatment - an individual prophylactic plan should be developed.

The aim of the present paper was the research of the etiology and pathogenesis of the common CD on the grounds of a study of a group of patients in the Clinic of Skin and Venereal Diseases – Varna.

MATERIALS AND METHODS:

The present study includes 210 patients, observed and studied for a period of five years: 123 patients with ACD and 87 patients with ICD. The study was carried out using the method of the covered epicutaneous tests (chamber method), as substances included in the standard line were used as well as other substances selected according to the concrete circumstances. With each patient epicutaneous testing was carried out with 20 standard allergens, and with some patients – with some additionally selected allergens. The epicutaneous tests were checked at the 48th hour of their application. The conclusions for the etiological significance of the allergological tests were drawn on grounds of their comparison with anamnestic and clinical data. The differentiation of ACD and ICD was based on the following criteria: clinical picture, anamnestic data, skin tests results, dynamic observation of the cases.

RESULTS AND DISCUSSION:

Of all the studied patients with CD in 205 patients the etiological cause was proven, as the following distribution in connection with the clinical and pathogenetic

diagnosis was established (Table. 1): ACD was established in 123 patients (58.5%) of all the studied, ICD – in 87 patients (41.4%), out of whom in 82 patients the etiological cause was established and in 5 patients it remained unclear.

Table 1. Distribution of the patients with contact dermatitis according to clinical and pathogenetic diagnosis (n= 210)

| Diagnosis | Total number of patients | % | Number of patients with positive epicutaneous tests | % |
|-----------------------------|--------------------------|------|---|-----|
| Allergic Contact dermatitis | 123 | 58.5 | 123 | 100 |
| Irritant Contact dermatitis | 87 | 41.4 | | |
| Total | 210 | 100 | 123 | |

The analysis of the received 123 positive skin tests in patients with ACD justifies the following conclusions about their etiology (Table.2). Of greatest etiological significance for ACD are: detergents (16.43%), metals (15.02%), rubber additives (14.80%). The groups of

allergenic parabens (10.79%), antiseptics (10.32%), formaldehyde (9.38%) and scents (8.92%) showed considerable frequency as causative agents of ACD. Of smaller frequency turned out to be the Peruvian balsam (7.04%), medicaments (5.16%) and other allergens (2.80%).

Table 2. Etiology of the common allergic contact dermatitis (123 positive epicutaneous tests)

| Allergens | Positive epicutaneous tests | % |
|--|-----------------------------|-------|
| Metals – nickel, chromium, cobalt | 32 | 15.02 |
| Rubber additives - Thiuram Mix, Phenylendiamin, Diphenyl-p-phenylendiamin, Mercaptobenzthiazol | 30 | 14.80 |
| Medicaments – neomycin, benzocain, chlornitromycin | 11 | 5.16 |
| Formaldehyde | 20 | 9.38 |
| Peruvian balsam | 15 | 7.04 |
| Scents (Parfum Mix)- cinnamat alcohol, cinnamat aldehyd, Euginol, Isoeuginol, Garanil | 19 | 8.92 |
| Parabens (Paraben Mix)- Nipabutyl, Nipagin A, Nipagin M, Nipazol M | 23 | 10.79 |
| Detergents | 35 | 16,43 |
| Antiseptics | 22 | 10.32 |
| Other allergens | 6 | 2.8 |
| Total | 213 | 100 |

The distribution of the irritant etiological causative agents in the patients with ICD was the following (Table 3): the most frequent agents are the detergents (28.73%), soaps (27.58%), rubber additives (13.79%), followed by

strong bases and acids (10.34% and 8.04%), organic solvents (3.44%) and alcohol solutions (2.29%). In 5 of the studied patients (5.74%) the respective irritant agent remained unclear.

Table 3. Etiology of the common irritant contact dermatitis in 87 patients

| Irritants | Number of patients with established irritant agent | % |
|---|--|-------|
| Soaps | 24 | 27.58 |
| Strong acids | 7 | 8.04 |
| Strong bases | 9 | 10.34 |
| Organic solvents | 3 | 3.44 |
| Alcohol solutions | 2 | 2.29 |
| Detergents | 25 | 28.73 |
| Rubber Additives | 12 | 13.79 |
| Patients with unclear etiological cause | 5 | 5.74 |
| Total | 87 | 100 |

The received results for contact sensitization to metals, and above all to nickel, correlate with the data in medical literature. The nickel allergy - globally viewed - is very frequent (16), ranging between 11% and 20% (1,18); it is often occupational and has been decreasing in the last few years (20). Contact with nickel is usually established when trinkets are worn or when metal processing is done professionally. Chromates cause ACD in 6.6% of the cases (1), as they are more often than not professional noxa, and the cobalt chloride – in 5.6% (1). Rubber additives also frequently cause ACD (16,19), approximately in 14% of all cases (18). The results of this study are analogical. Of the rubber additives of considerable etiological importance are the latex particles (17), together with the risk agents in this relation – atopy, spina bifida etc. (17) and p-phenylenediamin (PPD); the latter having a frequency of 4.1% (1). Contact with this allergen in everyday life and in many professions is very frequent. There are reports of ACD from rubber products (11), from iso-dyes containing PPD and used in the textile and shoe industry. A number of natural dyes used in tattoos contain PPD and cause ACD (12), as does the printer toner. Widely discussed is the cross allergic reaction between PPD and hair dye (8,15) in everyday and professional aspect, as well as the possibility of photoallergic reactions (13). PPD causes a cross allergic reaction also with local anesthetics (10) and with sulphonamides and anti-diabetic medicaments with a similar structure. (15).

The etiological significance of the medicaments is a bit more limited: local antibiotics (2), local anesthetics (10),

local corticosteroids. Skin occlusion in such cases is discussed as a predisposing factor for the exacerbation of the ACD.

The scents also occupy a major place in the etiology of the ACD (16,20), as their frequency ranges between 6.8% (1) and 10% (6). The same holds true of the parabens (7) and the formaldehyde (1,19). The possibility of co-reaction between formaldehyde and glutaraldehyde should not be ignored. The Peruvian balsam presents 5% of the ACD cases (6). In everyday life ACD is most often caused by detergents (4), as well as by antiseptics (18).

The role of the irritants in the etiology of the CD is significant: 27% according to the data in medical literature (19), 41.4% according to the present study. The most frequent irritants whose effect is felt after a systematic, manifold contact are soaps, detergents, latex particles (18) as well as strong acids, bases, and organic salts whose effect is felt after a single contact (9).

CONCLUSIONS:

In the etiology of the common ACD of definite importance are the detergents, metals, rubber additives, parabens, antiseptics, formaldehyde and scents, whereas with ICD – soaps, other detergents and latex particles.

The clarification of the etiology and pathogenesis of the CD is of crucial importance for the accurate therapeutic approach, as well as for justified and efficient prophylactics for each concrete case.

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