

## ON CELL-MEDIATED IMMUNITY IN ACNE CONGLOBATA

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**Abstract.** In 25 of 35 cases of acne conglobata, a reduction in or lack of delayed reactivity was found by intracutaneous tests with a battery of antigens. On the basis of these findings as well as of normal T-cell function in lymphocyte culture and of negative Kveim-tests (in three cases), the possible immunological mechanisms are discussed.

**Key words:** Acne conglobata; Delayed reactivity; T-cell function; Kveim-reaction

Acne conglobata (AC) represents the most severe form of acne (or according to some views a separate entity (9) where the deep inflammatory changes result in nodules, cysts, abscesses, disfiguring hypertrophic or atrophic scars, discharging sinuses not only in the classical acne areas but extending to other parts of the body. The condition is often associated with suppurative hydrosadenitis, dissecting cellulitis of the scalp and pilonidal cyst (11). The microscopic picture shows the characteristics of a foreign body granuloma around a lipid-keratinous mass. Although the limit to intense papulonodous acne is not always distinct, the morphology, the sex prevalence, in some cases the presence of XYY chromosomal aberration (17), increased basophil count in cantharidine blisters (6), as well as the favourable response to local and to a certain degree to internal steroids—all these give a special position to AC within the acne group. An additional form (complication) is the development of an acute febrile ulcerative form including polyarthralgia and leukocytosis or leukemoid reaction, which was interpreted as being due to type III hypersensitivity (7, 15, 16). Since in earlier investigations it was found (12) that the delayed reactivity to a common battery of allergens is reduced, this question was investigated in a larger material.

### MATERIAL AND METHODS

(a) 35 patients with a typical clinical picture of AC were investigated intracutaneously on the arm by injecting 0.1

ml of the following test solutions: tuberculin 0.1 mg (PPD second strength=0.05 mg/ml); streptococcal vaccine (ca. 50 million organisms injected); staphylovaccine (6 million organisms+0.15 alfatoxoid injected); mumps vaccine (Parke-Davis) 1:10; Schick test with corresponding control solution as well as physiologic NaCl.

(b) In 3 patients with negative results to intracutaneous tests according to (a), Kveim antigen was applied on the forearm. The Kveim antigen was prepared from lymphoid tissue of a patient with proven sarcoidosis and checked for sterility and biologic activity. The reaction was read after 3 and 6 weeks and checked by biopsy.

(c) Biopsies were taken from representative lesions in 5 patients.

### RESULTS

(a) The results of the delayed reactions in AC are summarised in Table I. They indicate a reduced, delayed reactivity in the majority of the cases investigated (25 out of 35).

(b) Negative findings were observed for Kveim reactivity in all 3 patients.

(c) The pathological picture showed mild epidermal alterations and an intense perifollicular inflammatory cell infiltrate consisting mostly of leukocytes, with scattered lymphocytes and some plasma cells. In a somewhat later phase a dominance of histiocytes as well as some giant cells of the foreign body-type were seen in addition to lymphocytes and some leukocytes. In this phase and later on, fibroblast and newly formed capillaries also were observed. Although a massive epithelioid cell reaction was never observed, the picture resembles mostly a mixed granulomatous (foreign body-type) inflammation and granulation tissue.

### DISCUSSION

As in earlier investigations, a reduction/lack of delayed reactivity of AC was found in the majority of cases. Had the results been further analysed, according to the extension and activity of the disease,

Table 1. Results of delayed reactivity to intracutaneous tests in acne conglobata (35 cases)

	No. of patients
Lack of reactivity	13
Reduced reactivity	12
Normal reactivity	10

the groups would have been too small to obtain statistical differences. Nevertheless, one gains the impression that a lack of negative delayed reactivity to the battery of allergens applied occurs more frequently in cases of intense clinical lesions involving large body areas. The diminished delayed reactivity was also mentioned by Plewig & Kligman (11) in the case of mumps, tuberculin and contact allergens, whereas normal cell-mediated immunity was found in 5 (control) cases (14). In earlier studies (13) on 9 patients with negative delayed reactivity to the test solutions mentioned under (a), the T-lymphocyte function was normal when tested with non-specific mitogens (PHA, PWM, ConA, PPD and Mitomycin-C). This means that there exists a dissociation between the results of delayed reactivity and lymphocyte transformation tests. This phenomenon, which has also been observed in some cases of juvenile rheumatoid arthritis (5) and cutaneous candidiasis (8) may have different explanations:

(i) The reactivity is unaltered to non-specific mitogens, but may be altered if a specific antigen can be applied, in analogy to sarcoidosis (4).

(ii) The negative lymphocyte function results demonstrate that the reduction in skin reactivity is

due to a diminution of the non-specific inflammatory response.

The possibility mentioned under (i) is less likely. It is highly uncertain and unproven whether the granuloma formation in AC is elicited by some lipid/keratinous delayed-type allergen. In other granulomatous lesions this response is usually the result of a reticulo-endothelial cell proliferation elicited by an insoluble foreign substance and only in some cases does a proven granulomatous hypersensitivity develop, as against beryllium, which was classified as of type IV (1, 2). In analogy, the possibility of an allergen eliciting granulomatous hypersensitivity response in AC cannot be totally excluded. However, more arguments are in favour of the assumption, that insoluble sebum ingredients (such as wax esters, squalene and/or keratinous flakes) represent foreign bodies in the dermis, which lead to the development of multiple local granulomas in AC. In contrast to the situation in foreign body-type granuloma, where a local lesion develops, multiple foreign body granulomas are interpreted as a systemic sarcoidal type reaction (3). The analogy to sarcoidosis is not too remote, but in our cases the Kveim reaction was negative and the histological picture was more of the mixed granuloma type (10) than of granulation tissue (Table II). The relationship of AC to sarcoidosis may consist in the common feature that multiple insoluble substances in the dermis elicit, instead of the usual delayed-type reaction, another type of reactivity, i.e. the sarcoidal-type reactivity. On the other hand, in sarcoidosis, immunologic mechanisms may be supposed, whereas in AC they are primarily non-immunologic. It seems that in AC, in addition to that of other acne types, the

Table II. Possible immunological mechanisms in acne conglobata

Disease	Histology	Delayed reactivity	Kveim reaction	Supposed mechanism
Foreign body granuloma	"Sarcoid type"	Normal	Negative	Non-immunologic phagocytic process?
Hypersensitivity granuloma	"Sarcoid type"	Increased	?	Class of type IV sensitivity?
Sarcoidosis	"Sarcoid type"	Lacking/reduced	Positive	Immunologic, peculiar (other than types I-IV?)
Acne conglobata	Mixed granuloma	Reduced/lacking	Negative <sup>a</sup>	Non-immunologic phagocytic process?
Acne febrile ulcerative	+ulcerative necrosis	Depressed	?	Type III sensitivity?

<sup>a</sup> Based on 3 investigated cases.

basic mechanism consists of a granulomatous response, associated with a decreased tendency to delayed reactivity.

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