

## Fibrin Microclot Formation in Patients with Acne

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After the addition of *E. coli* polysaccharide to blood from patients with deep inflammatory acne, microclots formed in all patients, whereas this was rarely seen in mild acne and never in controls. Furthermore, spontaneous microclot formation without addition of endotoxin was seen in 5 of the 10 patients with the most severe acne. *Key words: Acne; Fibrin; Microclots; Endotoxin.* (Received March 19, 1983.)

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When blood is mixed with endotoxin *in vitro* the formation of stellate fibrin crystals mainly around monocytes has been seen in patients with psoriasis, vasculitis and various skin disorders including acne (1). In certain disorders such as ulcerative colitis, severe psoriasis, certain cancers and during pregnancy the phenomenon could be observed without adding endotoxin (2). It has here been taken as a measure of circulating endotoxins. In the present work we studied the formation of fibrin microclots in patients with acne of various degrees.

### PATIENTS

Twenty men and 20 women, aged 15-29, with acne were studied. Blood samples were taken at the first visit, at which time none were undergoing systemic treatment. The degree of acne was scored I-IV, as described by Pillsbury et al. (3). Here grade I is comedo acne, II superficial papular and pustular acne, III papular and pustular with some nodules, and IV a very severe acne with extensive nodules and often cysts.

Table I. Number of patients with positive (6 microclots/tube) and negative tests for microclot formation after addition of saline and endotoxin

	Saline		<i>E. coli</i> lipopolysacc.	
	Neg.	Pos.	Neg.	Pos.
Healthy subjects	20	0	20	0
Acne grade I	13	0	12	1
Acne grade II	6	0	2	4
Acne grade III	9	2	0	11
Acne grade IV	5	5	0	10

## METHODS

Blood was drawn into 10-ml vacutainer glass tubes (Becton-Dickinson A 4716) containing 144 U of sodium heparin. One-ml aliquots were mixed with 0.01 ml of 1% lipopolysaccharide type B in saline (*E. coli* 0128B 12 Difco Labs., Detroit Mich., U.S.). Saline was added to the controls. Buffy coat was prepared by centrifuging in plastic tubes as described earlier (4).

After mixing in a polyethylene cup, a sample was drawn up into 50-mm-long rectangular capillary tubes (Microslides, Vitro dynamics, Rockway, N.J. 07866, U.S., Catalog No. 5005, internal diam. 0.05 mm). Each end was sealed with Critoseal® (Lancer, St. Louis, Mo, U.S.), mounted flat on a microscope slide and kept horizontal in an incubator at 37°C for 24 hours (1). The total number of crystalline stars formed were counted in a phase interference microscope.

## RESULTS

The results are given in Table I. In patients with severe acne the addition of endotoxin induced formation of fibrin microclots which was most marked in the more severe cases. In 5 of the most severe acne patients microclots were seen without adding endotoxin.

## DISCUSSION

Endotoxins are known to activate complement by the alternative pathway and induce fibrin formation as well as the Schwartzman reaction. The increased sensitivity to endotoxin in blood from patients with severe acne could be a factor of importance for the tissue destruction seen in acne conglobata. Contrarily, one could say that the increased breakdown of tissue could give an increased release of thromboplastin as described in tumour tissue (5). However, since thromboplastin does not induce microclot formation when added to the blood, such an explanation seems less likely. The occurrence of microclots without adding endotoxin indicates the presence of circulating endotoxins in the patients with the most severe forms of acne (2).

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