Répartition de l'activité du C1q dans différentes populations de leucocytes

Fractions	% Polymorphonucléaires	Plaques d'hémolyse par 10^6 cellules
1	0–2	15
2	0–2	260
3	18	80
4	>95	8

Il apparaît donc que la libération dans le gel de C1q actif est la propriété d'une population de cellules correspondant à la couche 2 de la centrifugation sur albumine. Le fait qu'en absence de R C1q dans le milieu il n'y ait pas d'hémolyse suggère que seuls certains composants du complément, dont le C1q, sont contenus dans ces cellules. Celles-ci sont selon toute vraisemblance des mononucléaires mais seules des méthodes de cultures cellulaires, d'incorporation d'amino-acides radioactifs dans la protéine et de morphologie permettront de les placer dans une classe définie de leucocytes.

Summary. Human blood leucocytes were shown to liberate active C1q in vitro. An agarose gel containing sensitized sheep red cells and a serum depleted of C1q has been used to detect C1q activity. A population of mononucleated cells which display such activity could be isolated by centrifugation on an albumin gradient.

H. JACOT-GUILLARMOD

Institut de Biochimie de l'Université de Lausanne, 1005 Lausanne (Suisse), 4 juin 1969.

Shwartzman Phenomenon Without Endotoxin Preparation

A number of observations indicate that granulocytes play an important role in the pathogenesis of inflammation, hemorrhage and necrosis developing in the local Shwartzman reaction[1–3]. THOMAS[4] was able to induce the Shwartzman phenomenon with a preparatory dose of leukocyte granules rich in lysosomes and with an eliciting injection of endotoxin.

On the other hand, it was published by KELLER and SORKIN[5] that casein, peptone and bactocasitone could elicit the chemotaxis of leukocytes without any apparent immune reaction in an in vitro system.

In view of the above facts, we attempted the preparation of local Shwartzman phenomenon with casein (Hammersten, Reanal, Hungary), Witte's peptone and bactocasitone (Difco Laboratories). These cytotaxins were used in 1% solutions of saline at pH 7. We performed our experiments in autumn on male conventional rabbits coming from a breeding stock, weighing 2500 ± 200 g. Before the experiments the rabbits had been kept on standard diet under normal conditions.

The local Shwartzman phenomenon was induced on the dorsal skin of rabbits. The preparatory injections were 1% solutions of casein, Witte's peptone and bactocasitone in 0.4 ml volumes. In some cases 0.01 *N* HCl, 0.01 *N* NaOH and saline were given for control. As a challenging dose 150 µg of Boivin endotoxin (from *E. coli* 0111) was administered i.v. 24 h later. The result was seen after a further 24 h on the inside of the skin. In some cases 6 h after the eliciting injection, specimens of the skin were excised for histological examination. After fixation in Susa's solution and embedding in paraffin, the sections were stained with hematoxyline and eosine.

From these preparations we were able to produce a moderate but typical local Shwartzman reaction both with casein and peptone – as can be seen in Figure 1a. This phenomenon was histologically the same type in every respect as the one prepared with endotoxin (Figure 2a and b). The results are summarized in the Table.

Our findings indicate that the rabbit's own leukocytes, when attracted to the site of casein, peptone or bacto-

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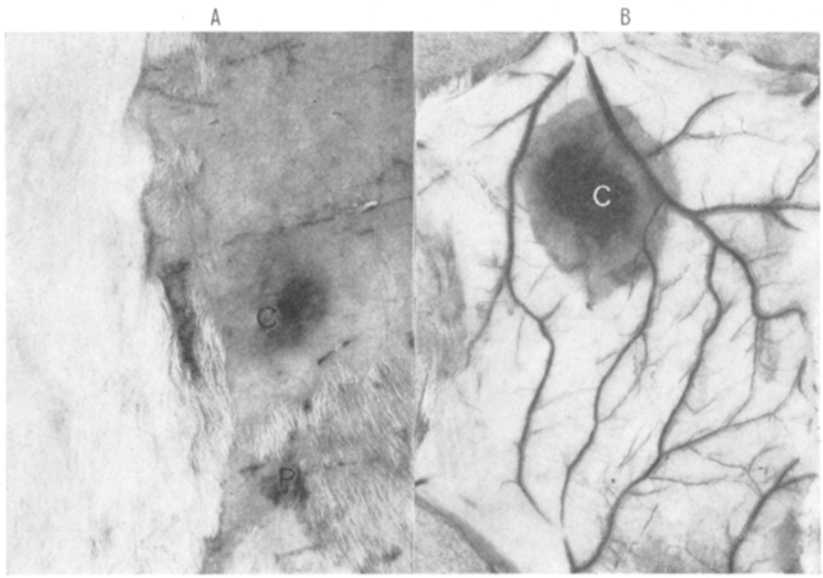

Fig. 1. (A) Local Shwartzman reaction. C, prepared with casein (1%) and P, peptone (1%). (B) Reaction to the casein from the inside of the skin.

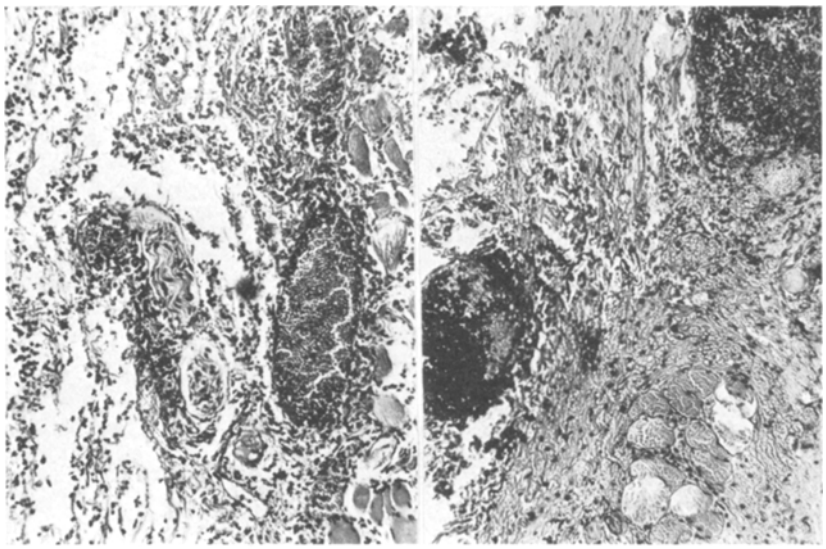

Fig. 2. Reactions in the skin 6 h after the eliciting endotoxin dose. (A) Prepared with endotoxin and (B) with casein. In both cases there are polymorphonuclear and round cell infiltration, perivascular oedema and obliteration of small vessels. Advanced hemorrhagic necrosis. × 150.

casitone preparation are able to elicit a local Shwartzman reaction after endotoxin provocation. We observed hemorrhages and necrosis macroscopically and also thrombosis by histological examination. Casein was found to be the most potent agent in the preparation of this phenomenon; peptone and bactocasitone proved to be effective only to a lesser extent. Our results agree with the in vitro experiments of KELLER and SORKIN[5].

Without endotoxin provocation, we never saw any thrombosis or hemorrhage: only round cells infiltration and a mild inflammation.

The following important consideration must be taken into account: with peptone or casein, administered i.v. – as a challenging dose – we have never been able to elicit any reaction after preparation with casein, peptone and bactocasitone. Neither was it possible when giving a surplus amount of casein or peptone (5 ml from the 1% solution) i.v., the dose being calculated from a reaction prepared and elicited with endotoxin. On the basis of this fact, it seems highly probable that casein and peptone were free from endotoxins. GRANT et al.[6] observed local Shwartzman reaction after preparation with ferritin and eliciting with endotoxin[6]. We assume that this effect was also not due to the endotoxin contamination of ferritin but to its chemotactic feature.

PERILIE et al.[7] showed that the early neutrophylic phase of the local inflammatory response was significantly delayed and diminished in diabetic patients. SZILÁGYI et al.[8] have observed that the local Shwartzman reaction was markedly inhibited by hyperglycaemia. Our earlier observations that hyperbaric oxygenation enhances the local Shwartzman phenomenon provide another indirect proof of the important role that lysosomes play in this reaction[9].

After all, it may be assumed that leukocyte infiltration is the central event in the local Shwartzman reaction and the release of lysosomal enzymes represent a final common pathway.

Local Shwartzman reaction in rabbits

No. of animals	Diameters of skin reactions in mm prepared with Casein (1%)	Peptone (1%)	Bactocasitone (1%)	0.01 *N* HCl	0.01 *N* NaOH
1	35×55	14×14	10×8	∅	∅
2	19×16	9×7	12×12	∅	∅
3	16×16	4×4	4×3	∅	∅
4	18×16	8×4	–	–	–
5	18×12	12×8	–	–	–
6	16×13	8×3	–	–	–
7	8×4	∅	–	–	–
8	18×3	14×12	–	–	–
9	12×11	∅	–	–	–
10	∅	∅	–	–	–
11	35×35	–	–	–	–
12	19×16	–	–	–	–
13	16×16	–	–	–	–
	Casein 3%	1.5%	0.75%		
14	20×18	18×18	6×5	–	–	–
15	19×14	18×18	2×2	–	–	–
	Controls prepared with casein and peptone without endotoxin provocation				
16	∅	∅	–	–	–
17	∅	∅	–	–	–
18	∅	∅	–	–	–
	Challenging with 5 ml of 1% casein i.v.				
19	∅	∅	∅	–	–
20	∅	∅	∅	–	–
21	∅	∅	∅	–	–

Zusammenfassung. Kasein, Pepton bzw. Baktokasiton wurde als präparierende Erstinjektion für lokalisiertes Shwartzman-Phänomen an Kaninchen verwendet. Nach provozierender i.v. Endotoxininjektion kommt es zum typischen Shwartzman-Phänomen. Da die verwendeten Substanzen Chemotaxis von Leukozyten verursachen, ist anzunehmen, dass die an Stelle der präparierenden Injektion angesammelten Leukozyten in der Ausbildung des Shwartzman-Phänomens eine vorwiegende Rolle spielen.

S. TÓTH, L. MUSZBEK,
T. SZILÁGYI and J. LACZKÓ

Institute of Pathophysiology and Institute of Anatomy, University Medical School, Debrecen (Hungary), 24 March 1969.

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