

On Differential Diagnosis of Streptococci. Differentiation from *Corynebacterium pyogenes* varietas *hominis*.

F. Patočka, A. Souček, M. Mára, L. Záhorová and A. Jedličková

Institute for Medical Microbiology and Immunology, Charles University

Within the past two years our laboratory has been studying materials sent from two regions. The study has been reviewing bacteriological isolations of agents causing acute and chronic tonsillitis, rarely with metastatic complications and sometimes with exanthema. With the aid of this demonstrated phenomenon, we found that from many materials of suspected streptococcal tonsillitis corynebacteria were isolated. Corynebacteria are the object of our studies.

Within the past year we have isolated 122 strains of this corynebacterium, which grows in two types of colonies:- both may imitate streptococci. The first variant grows in larger colonies with a narrower zone of beta-haemolysis - after prolonged incubation the haemolysis is more intense - while the second variant in respect to its haemolysis and size of colonies remains indistinguishable from the pyogenic streptococci.

We are dealing with a microbe that has rarely been described in literature since 1906 under various names, and has been studied by us since 1945.

Beside the apparent similarities with the pyogenic streptococcus in its growth on solid and liquid media, Cummins, Harris and Burksdale demonstrated further relationships with the streptococci. They found partial identity in antigenic structure of certain mutants of this corynebacterium and in the cell wall composition of both species.

So far we consider this corynebacterium a human variant or mutant of the animal *Corynebacterium pyogenes*. We are able to isolate and distinguish it

from pyogenic streptococci already in primary culture on blood agar at first glance by its inhibition of staphylococcal haemolysis. The inhibitor is a substance which, according to our experiments, is identical or closely related to the toxin of this corynebacterium. The toxin of the pyogenic corynebacterium was isolated by us usually from both cultures by selective adsorption onto erythrocytes followed by elution. The production of toxin is initiated during the exponential phase of bacterial growth, the toxin persists in the medium unaltered for three weeks. It is a substance of protein nature and thermolabile, which is inactivated in 1 hour at 56°C. Further concentration of the toxin from broth cultures and eluates can be achieved by precipitation with methanol or ammonium sulphate between 25 - 50 % saturation. Subcutaneous injection of this substance produces sanguinolent oedema with hemorrhages followed by necrosis. A similar reaction, i.e. necrosis with hemorrhagic border and massive inflammatory oedema is produced in rabbits on intracutaneous injection. According to our yet incomplete experiments, intravenous injection of this toxin has a lethal effect in rabbits. We are convinced that most of the symptomatology in humans is produced by this toxic substance, such as exanthema in some cases of corynebacterial tonsillitis.