Problems in Bacteriologic Examinations

I. Modern Trends in Diagnostic Microbiology

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Nozomu Kosakai
Department of Clinical Pathology
Juntendo University School of Medicine

Modern trends in diagnostic microbiology

Microbiological examinations in clinical medicine consist of, first, finding out the pathogen which is suspected to be the cause of the infectious disease, second, testing the sensitivity of the pathogenic bacteria to sulfonamides and antibiotics, and third, finding out the antibody in the patient by various serological technics.

1) Due to the development of chemotherapy and the wide use of chemotherapeutic agents, it became more and more difficult for us to presume the pathogen of the infectious disease from the clinical symptoms.

So we must systematize the routine procedures which find out the pathogens from specimens. Such routine procedures are different according to the size of clinical laboratory. In large laboratories they can use many kinds of culture media for isolation of pathogenic bacteria and use anaerobic culture routinely, and also they can differentiate and identify many kinds of pathogens by biological and serological tests. But in small laboratories they can use rather a few kinds of media for isolation and they can identify only a few kinds of pathogens.

Even in small laboratories they must do sensitivity test of pathogenic bacteria to chemotherapeutics, because it is more valuable for clinicians to know the sensitivity of the suspected pathogen as soon as possible than to know the name of pathogen by biological and serological tests.
2) In order to identify the bacteria, rather complicated procedures are necessary in many cases, and such procedures can not be used in rather small laboratories. Recently more simple methods are invented in this field. For example, the disc in which carbohydrates or other drugs are impregnated has begun to be used for determination of bacteria. Also the disc which contains bacitracin is used for differentiating group A streptococci from other groups of hemolytic streptococci, although ordinarily a very complicated serological method is necessary to identify group A streptococci. Thus rather simple methods for identifying the bacteria should be improved in the field of diagnostic bacteriology.

3) In order to diagnose the viral diseases, isolation of virus and serological test for detecting the antibody are necessary. But the isolation of virus is not yet performed routinely in almost all hospital laboratories. If the tissues or cells which are necessary for isolation of virus could be sold just as in the United States of America, several kinds of virus could be isolated in hospital laboratories.

4) Fluorescent-antibody technics could be introduced into the routine microbiological examination in near future, then several kinds of pathogenic bacteria and virus could be detected directly from the specimens.

An ideal of central clinical laboratory

After the World War II in Japan clinical laboratories have been centralized in most of the hospitals, and at present it is our common sense that each hospital must have its centralized laboratory.

In order that the clinical laboratory could display its function fully, following points are particularly considered.

1) A system to train clinical pathologists such as in the United States should be established in Japan, because only clinical pathologist could manage the clinical laboratory, supervise medical technologists and become the good co-worker of clinicians for the better medical treatment.

2) Clinical laboratory must have necessary number of tech-
nologists, aids, washers and clerks, especially well trained technologists. Usually number of laboratory tests is rapidly increasing but number of technologists cannot increase and is limited. If the technologists are overloaded, the accuracy of tests would be lost, so every clinical laboratory should have enough number of technologists.

3) In order to keep results of tests accurate, director of laboratory must try every possible mean. For example, he should teach and train his technologists always, check their technics, or use "control serum" in chemistry laboratory.