STUDIES OF HEMOLYTIC STREPTOCOCCAL INFECTION

I. FACTORS INFLUENCING THE OUTCOME OF ERYSIPELAS

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In order to gather more precise information regarding the factors influencing the course and outcome of certain hemolytic streptococcal infections, we have examined the hospital records of 1400 patients with erysipelas who were admitted to the Boston City Hospital during a period of of scarlet fever as it occurred in Massachusetts over an eleven-year period was found to be identical with that of erysipelas as observed at the Boston City Hospital (Figure 1). If one is permitted to use scarlet fever as an index of such infections, it is evident, then, that erysipelas has



FIG. 1. THE SEASONAL INCIDENCE OF ERYSIPELAS AT THE BOSTON CITY HOS-PITAL AND OF SCARLET FEVER IN THE STATE OF MASSACHUSETTS.

eleven years. The results of this examination are set forth in the present communication.

Seasonal incidence

It is well established that hemolytic streptococcal infections are most prevalent in the winter and early spring months. The seasonal incidence the same seasonal incidence in Massachusetts as other hemolytic streptococcal infections.

The relation of morbidity and mortality to age

The general mortality of the 1400 cases was 16.4 ± 3.6 per cent. The variations in mortality from year to year were 9.3 to 21.0 per cent.

When these results were studied more carefully for factors that might account for the differences in mortality, it was found that the age of the patient, the presence of debilitating diseases and the occurrence of bacteremia were important.

Figure 2 shows the age incidence and the percentage mortality at different age periods. It is seen that the death rate is exceedingly high during the first two years of life, and after that period the mortality is low until after the fifth decade when there is a rapid increase. In the period between three and 50 years the mortality was low in spite of the increasing frequency of the disease as it is observed during this period of life. The serve as an important contributing factor in the death of individuals suffering from such diseases. Of the 220 fatal cases of erysipelas, one or another of the conditions just mentioned was present in 80 cases, and in 20 cases the erysipelas was merely the mode in which the streptococcal infection spread from a serious local infection such as mastoiditis, puerperal sepsis or suppurative otitis media.

Blood cultures

Inasmuch as blood cultures were not taken regularly, precise information regarding the incidence of bacteremia was not available. In a series of



FIG. 2. AGE INCIDENCE AND THE PERCENTAGE MORTALITY OF 1400 CASES OF ERYSIPELAS.

differences in mortality at different age periods were so great that there can be no doubt that the age of the individual is of the highest importance in evaluating any mortality statistics. These observations are in accord with those of other observers (1, 2, 3).

It is not unusual for erysipelas to appear during the course of a debilitating malady such as chronic alcoholism, chronic heart or kidney disease, cirrhosis of the liver and carcinoma, and to 30 cases that we have studied recently, however, all of which recovered, bacteremia was observed only once. On the other hand, in another group of 39 fatal cases of erysipelas in which necropsies were done, it was found that bacteremia was present in 31, approximately 80 per cent of them. The anatomic lesions found in these individuals, aside from the erysipelas, were bronchopneumonia 12, myocardial fibrosis 8, cirrhosis of the liver 5, acute endocarditis 3, empyema 2, nephritis 2, and retroperitoneal abscess 1. It would appear, then, that bacteremia is of serious prognostic importance, since a high percentage of the fatal cases show it. This is in accord with the observations of Sprunt (4) and Jochmann (5).

The variation in mortality from year to year and month to month has been commented upon by some authors. This is in agreement with the present observations. However, from a study of the cases, the factors influencing the variation in the death rate from year to year, or month to month, would appear to be due to the differences in age and the other factors cited rather than to seasonal or yearly changes in the severity of the infection. For example, during the year 1931, the mortality rate was 13.0 per cent and during 1934, 21.0 per cent. The age groups were similar in distribution but, of the 22 deaths over 40 years of age in the year 1934, 20 of them occurred in association with debilitating disease. In 1931, there were 8 deaths in patients over the age of 40 years; in 6 of the 8 debilitating disease was present. In the others, in whom recovery occurred, there was no evidence of debilitating diseases. Comparison of other years yielded the same type of information so that there seems to be no doubt that the yearly variation in mortality can usually be explained upon a basis of the factors mentioned instead of a change in the severity of the disease.

COMMENT

The above observations would indicate that erysipelas is a disease with the same seasonal incidence as other streptococcal infections. It occurs at all ages but is seen more often after the age of 20 years. It follows wound infections or arises as a complication of acute tonsillitis, acute sinusitis, acute otitis media or mastoiditis, puerperal sepsis, infections of the umbilicus and hemolytic streptococcal empyema. It is especially common in the presence of chronic debilitating diseases such as cirrhosis of the liver, chronic alcoholism, chronic cardiac or renal disease, lupus erythematosis, lupus vulgaris and cancer. In not a few cases of facial erysipelas, the infection begins with an acute hemolytic streptococcal infection of the nasal passages.

The mortality of erysipelas depends to a large extent upon the age of the individual, the presence of bacteremia, and whether it complicates a debilitating disease or a hemolytic streptococcal infection elsewhere. The variations in mortality from year to year and month to month can be explained in large part by the various factors just mentioned. Of the greatest importance is the question of age and debilitating diseases.

With these facts in mind, we have proceeded to study the immune reactions in a group of patients with erysipelas in an attempt to obtain information regarding the mechanism of recovery from erysipelas. The results are recorded in the paper that follows immediately.

SUMMARY AND CONCLUSIONS

From a survey of the records of 1400 cases of erysipelas it was found that the general mortality was 16.4 ± 3.6 per cent. When this question was investigated further, it was found that the age of the individual, the presence of debilitating diseases and bacteremia were the most important general factors influencing the mortality rate of the disease. The yearly variation in mortality could also be explained for the most part on the basis of the variation of the factors just mentioned.

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