—Short Communications—

The survival rate of macrophages in prostatic fluid from nonbacterial prostatitis patients

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Macrophages in prostatic fluid (PF) have not been well studied in the past probably because of the difficulty in obtaining macrophages in PF in comparison with macrophages from other sites such as alveolar macrophages which can be easily obtained by broncho-alveolar lavage. We began our study of macrophages in PF in 1979 to clarify the significance of leukocytosis in PF from nonbacterial prostatitis (NBP) patients, and we reported the dominant participation¹⁾ and activation²⁾ of macrophages in PF in the early stage of NBP.

Although the role of macrophages in PF is rarely described in the past studies, it is possible that they have similar roles to macrophages in other sites not only in phagocytosis but also in antigen presentation, as well as destruction and reconstruction of prostatic tissue. In this sense it would be interesting to know how long macrophages in PF survive. Recently Yui and Yamazaki reported an increase in survival or growth of tissue macrophages by phospholipids³⁾.

It is well known that macrophages in PF, especially in prostatitis, contain large amounts of fat, they are called oval fat macrophages. According to Yui and Yamazaki, it is possible that the fat in the macrophages may support the long term survival of macrophages in PF in prostatitis. As a preliminary study, we studied the effect of phospholipid on the survival of macrophages in PF from two NBP patients (patients 1 and 2). Monocytes from peripheral blood were also used as a positive control with respect to the effect of phospholipids in the first case (patient 1). Leukocytes in the prostate were obtained by prostatic massage and 2×10^6 leukocytes in 1 ml of Eagle's minimal essential medium (Gibco, Grand Island, NY., USA) containing 10% fetal calf serum (Gibco) (MEM/10% FCS) were introduced into Cell Wells with 24 well (Corning Glass Works, Corning, NY., USA). We preferred Cell Wells to Lab-Tek 4 chamber (Miles Laboratories Inc., Naperville, Ill., USA) which we used in previous experiments because there was less evaporation of culture medium in long term culture. Leukocytes were incubated at 37°C in a CO₂ incubator to allow the macrophages to attach to the bottom of the well. After incubation for 60 min, the well was washed three times with MEM/10% FCS to discard the unadherent leukocytes. Then the adherent cells were cultured either with or without 40 microgram of phosphatidylserine (PS) (Sigma, St. Louis, MO., USA) for 21 days when the difference between the two groups became apparent in patient 1. For the identification of macrophages, adherent cells were transferred from Cell Wells to the Lab-Tek 4 chamber using EDTA/trypsin solution (Gibco) after 21 days of

Fig. 1 Nonspecific esterase staining of monocytes from peripheral blood from NBP patient 1 after 21 days of culture with 40 microgram/ml of PS ($\times 400$).

Fig. 2 Nonspecific esterase staining of macrophages from NBP patient 2 after 21 days of culture without PS ($\times 400$).

All of the cells appeared in pictures were monocytes (Fig. 1) or macrophages (Fig. 2). The heterogeneity in intensity of staining may attribute to difference of activity or viability of cells.

culture, and nonspecific esterase staining and counterstaining of the glass plate in the Lab-Tek 4 chamber were performed after a further day of culture. Nonspecific esterase staining was reported to be useful in the identification of monocytes and macrophages because these cells contain abundant diffuse cytoplasmic esterase while nonspecific esterase in lymphocytes or granulocytes are localized or scanty⁴⁾.

As a result, an increase in the survival rate of macrophages in PF and monocytes from peripheral blood (Fig. 1) was observed by the addition of PS to the culture medium in patient 1, whose macrophages in PF were originally activated. However in patient 2, whose macrophages were also activated, no difference in the survival rate of macrophages in PF was observed between the control group without PS (Fig. 2) and the experimental group with PS. And macrophages in both groups survived for 21 days.

The reason for the difference between the two patients remains to be studied, however, we thought it interesting and worthwhile to report that macrophages have survived for 21 days in an ordinary culture medium without PS, because there have been no reports in the past concerning long term culture nor the long term survival of macrophages in PF. Definite leukocytosis in PF, even in NBP, is not common and moreover most of these leukocytes are nonadherent, and usually subside within a few days culture. Therefore it is quite difficult to obtain macrophages, especially activated macrophages in PF from NBP patients. However, the present experimental system may be useful in revealing the role of macrophages in PF from NBP patients through the long process of prostatitis.

References

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