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The effect of free radicals on the leukocyte alkaline phosphatase activity

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The alteration of leukocyte alkaline phosphatase (LAP) activity is associated with a number of pathological conditions. It has been demonstrated that some lysosomal enzymes are inactivated by free radicals [3, 4]. Our work was undertaken to determine whether the free radicals derived from neutrophils had an effect on LAP activity in vitro.

Materials and Methods

Heparinized blood was drown from healthy donors. Blood samples were incubated in the presence of 30 μg/ml E. coli 055 endotoxin and 0.002 mg/ml superoxide dismutase (SOD), respectively, at 37 °C for 30 min. LAP activity and nitroblue tetrazolium (NBT) reduction were measured quantitatively with our methods described previously [1, 2].

Results

Samples incubated without endotoxin showed a moderate decrease in LAP activity and a slight increase in NBT reduction. Results were more pronounced under the influence of endotoxin stimulus (Fig. 1). SOD diminished NBT reduction and increased LAP activity both in the presence

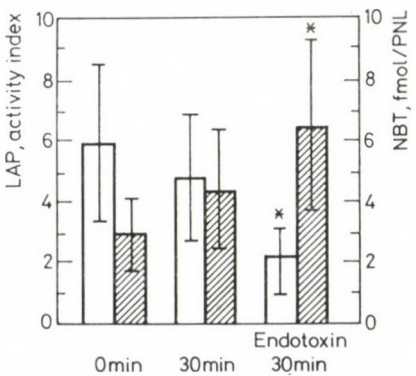

Fig. 1. Effect of endotoxin on LAP activity and NBT reduction. Open column: LAP activity index. Hatched column: NBT reduction. Each column represents the mean ± SD obtained in 10 experiments. ✳: statistically significant difference ($p < 0.05$) as compared to control

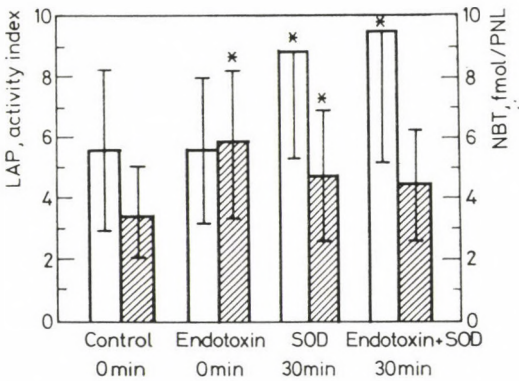

FIG. 2. Effect of SOD on the endotoxin stimulated NBT reduction and LAP activity. For other details see Fig. 1

and in the absence of endotoxin (Fig. 2).

From these results we suggest that free radicals may inactivate the LAP activity in the phagolysosomes.

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