VII. Blood and Spleen

Study on the MHP Penetration Through RBC Membrane

K. CHIBA, H. UEDA, T. MOTOKI, M. NAGATANI, K. KITANI, M. IIO and H. KAMEDA

The Second Department of Internal Medicine, University of Tokyo, Tokyo

In order to evaluate the possibility of MHP penetration through RBC membrane, following results were obtained.

1) Effect on the intra RBC reduced glutathione (GSH). GSH was measured by “Alloxan 305” method of Patterson et al. The unblocked amount of GSH after various concentrations of BMHP administration is expressed as % of the original amount (100%).

a) NEM and BMHP caused complete inhibition of 2 μM GSH solution by using more than 1.6 μM. (2 μM of GSH is contained in the 1 ml RBC.)

b) GSH in 1ml RBC (intact) was inhibited by over 1.6 μM NEM, however, only 70% is inhibited by 10 μM of BMHP.

c) Seventy % of GSH in hemolysate from 1ml RBC was inhibited by 10 μM of BMHP.

From these studies (B)MHP has inhibitory effect on the GSH solution, however, no inhibitory effect was found on the GSH in intact RBC as well as GSH in hemolysate. This shows (B)MHP neither penetrate into RBC nor combined with SH-radical compounds except GSH inside RBC after penetration. Following study, therefore, is performed.

2) After labeling RBC by 203Hg-MHP (10 μM/1ml RBC), RBC was separated into stroma and endosoma. Stroma contained 4.6% of activity whereas endosoma contained 8.68% of total activity administered. By the additional experiment using isotonic cold endosoma it was found that there is no possibility of transfer of MHP into endosoma from the stroma.

It was concluded that MHP at the concentration of 10 μM/1ml RBC mostly penetrated red cell membrane and was combined by SH radical compounds inside RBC (probably cysteine radical of hemoglobin). This caused no inhibition on the GSH in RBC. Only small amount (4.6%) was combined by SH radical in the RBC membrane.

Study of Splenic Sequestration Function
with 203Hg-MHP Method-Leukemia & Banti’s Syndrome

Y. OZAKI, S. HATTA, M. HASEGAWA, K. MATOBA, S. ARIMORI and I. IWASAKI

Department of Internal Medicine Okayama University, Medical School, Okayama

As we have previously reported splenic clearance of hypoplastic anemia by 51Cr labeled red cell and 203Hg MPH method, so now studied splenic clearance of all sorts of leukemia and Banti’s syndrome especially about the relation between splenic clearance and a degree of splenomegalia, and so tried to find splenic sequestration function.

Method: Following intravenous injection of mixed blood with 203Mg MHP (100 μCi), serial blood samples were taken and half time clearance was calculated. After one hour of injection external counting over the spleen, liver and heart was done and then scintiscanning.

Results:

1) In most of acute myeloic leukemia clearance is more prolonged than in normal controls (normal average; 56 minutes).

2) In one case of chronic myeloic leuke-