Cleveland Section

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Glutathione Content of Blood.

RUSSEL O. BOWMAN. (Introduced by V. C. Myers.)

From the Department of Biochemistry, School of Medicine, Western Reserve University.

The iodate titration method of Hess,[1] with slight modifications, has been applied to the determination of reduced glutathione in tungstic acid filtrates of blood in a series of almost 1000 cases. The method is accurate to 2 mg. per 100 cc., and the only known blood constituents to interfere are thioneine and possibly vitamin C. Thioneine is partly precipitated by tungstic acid, and could account maximally for only 2 mg. per 100 cc. The effect of vitamin C was not determined but should be insignificant.

Cell volumes by the hematocrit method were determined on most of the cases and reduced glutathione was expressed also on the basis of 100 cc. of cells.

Ninety-three normals gave a mean value of 27.5 mg. per 100 cc. of whole blood and 69.5 mg. per 100 cc. of cells. Variations were from 8 to 46 mg. per 100 cc. of whole blood.

Three hundred forty-two diabetic patients gave a mean value of 25.1 mg. per 100 cc. of whole blood and 66.1 mg. per 100 cc. of cells. The reduced glutathione did not vary consistently with insulin therapy, and did not vary with the level of blood sugar. In a smaller series of cases, reduced glutathione did not correlate with the saccharoids of the blood.

Eighty-eight nephritis cases showed a mean of 21.8 mg. per 100 cc. of whole blood and 68.4 mg. per 100 cc. of cells. Reduced glutathione did not accumulate in the blood when other nitrogen products were retained.

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[1] Hess, W. C., *J. Washington Acad. Sciences*, 1929, **19**, 419.

Series of determinations in cases of prostatitis, circulatory diseases, liver damage, fevers, tuberculosis, pneumonia, cancer and other pathological conditions, showed no direct correlation of reduced glutathione with the clinical diagnosis. In general, when the cell volume was low in anemic cases, the whole blood reduced glutathione was reduced below the normal mean, and the figure per 100 cc. of cells was high (80 to 90 mg.). The opposite was true for polycythemic cases.

No relation could be established for reduced glutathione with clinical condition, exercise, diet, age, sex or color. Reduced glutathione usually varied with the hemoglobin value, but not constantly.

Unexplained variations of reduced glutathione for the same individual, and for different individuals with similar pathological pictures, were found. These were not due to oxidized glutathione since the same variations were obtained using the Benedict-Gotschall[2] colorimetric method for total glutathione.

The results are mostly negative in character. They indicate that reduced glutathione is not a physiological constant, but tends to be such. Further work is necessary on the complex function of glutathione in the body, before the results can be interpreted.

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Magnitude of Urinary Iron Excretion in Healthy Men.

RAMON F. HANZAL AND FRANKLIN C. BING.

From the Institute of Pathology and the Department of Biochemistry, School of Medicine, Western Reserve University.

Henriques and Roland[1] have found that the daily excretion of iron in the urine of both normal and pathological cases is very small, amounting to only 0.08 to 0.32 mg. These values are much lower than those reported by earlier workers. Lintzel,[2] however, has claimed that not more than 0.02 mg. of iron per liter can be found in normal urine. Likewise, other investigators[3] have found the urine of patients suffering from various diseases to be practically iron-free. Because of its bearing on problems relating to the

[2] Benedict, S. R., and Gotschall, G., *J. Biol. Chem.*, 1933, **99**, 729.

[1] Henriques, V., and Roland, H., *Biochem. Z.*, 1928, **201**, 479.

[2] Lintzel, W., *Z. f. Biol.*, 1929, **89**, 350.

[3] Lanyar, F., Lieb, H., and Verdino, A., *Z. f. physiol. Chem.*, 1933, **217**, 160.