Studies on the Detoxicating Hormone of the Liver (Yakriton).

45th Report.

Effect of Yakriton on Blood Picture. Report II. Effect of Different Amounts of Yakriton* on Leucocyte Count. Animal Experiment.

By

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In a preceding paper¹⁾ Yanagawa and I reported on the effect of yakriton in 1 R.A.U.** on the blood picture of normal rabbits. In this paper I want to report on the effect of yakriton in a smaller number and a much larger number of R.A.U.

Method of Experimentation.

Normal rabbits were divided into different groups by means of the liver function test²⁾ devised by Sato and Sakurada, and only *b*- and *f*-classified animals were used.

Leucocyte counting was performed with the use of Shoji's³⁾ method.

Yakriton was subcutaneously injected and then the blood was examined at different intervals after the injection. And as control trials, 0.9% NaCl solution was subcutaneously injected in the same animals, and the blood picture was examined.

The preparations of yakriton used in my experiment contained 2 R.A.U. per 1 c.c. and $\frac{1}{2}$ R.A.U. per 1 c.c. respectively. To the group of rabbits with a large amount of yakriton, 10 R.A.U. per kilo gram of body weight, thus 5 c.c. of the preparation per kilo, were subcutane-

* Throughout the experiment insoluble yakriton was used.

1) M. Chiba and S. Yanagawa, Tohoku J. Exp. Med., 1933, 22, 355.

** R.A.U.=Rabbit-Ammonia-Units.

2) A. Sato and H. Sakurada, Tohoku J. Exp. Med., 1927, 8, 347.

3) K. Shoji, Tohoku J. Exp. Med., 1928, 10, 299.

ously injected. And to the group of animals with a small amount of yakriton, $\frac{1}{2}$ R.A.U. per kilo gram of body weight, thus 1 c.c. per kilo, was given. In control experiments, therefore, 5 c.c. and 1 c.c. of physiological saline were respectively used.

Result of Experiment.

The result will be clearly seen from adjoining figures (Cf. Schema and Figs. 1-20).

Schema: The relation between the lymphatic and the myeloid blood cells in the case of *b*-classed rabbits.

Fig. 1. Case of *b*-classed rabbit.....Type X.

Fig. 2. Case of *b*-classified rabbit.....Type V. Fig. 3. Case of *b*-classified rabbit.....Type V. Fig. 4. Case of *b*-classified rabbit.....Type X and Type V. Fig. 5. Case of *b*-classified rabbit.....Type V.

Fig. 6. Case of *f*-classed rabbit.....Type X and Type V. Fig. 7. Case of *f*-classed rabbit.....Type V. Fig. 8. Case of *f*-classed rabbit.....Type V. Fig. 9. Case of *f*-classed rabbit.....Type V.

Fig. 10. Case of *f*-classified rabbit.....Type V and Type X.

Fig. 11. Case of *b*-classified rabbit.

Fig. 12. Case of *b*-classified rabbit.

Fig. 13. Case of *b*-classified rabbit.

Fig. 14. Case of *f*-classified rabbit.

Fig. 15. Case of *b*-classified rabbit.

Fig. 16. Case of *f*-classified rabbit.

Summary.

I. 10 R.A.U. of yakriton.

If insoluble yakriton (2. R.A.U. in 1 c.c. of the preparation) was subcutaneously injected in the amount of 10 R.A.U. per kilo gram of body weight, then the following will hold true in the case of *f*-classed as well as of *b*-classed rabbits:

(1) The total leucocyte count shows always an increase for three hours after the injection.

(2) As to the relation of the two kinds of leucocytes, the curves of the myeloid and the lymphatic will take the form of lying X or V, (Cf. Figs. 1-10) because the myeloid cells show a gradual increase and the lymphatic ones a gradual decrease.

(3) In control experiments, i.e. experiments with physiological saline, an increase of the total number of leucocytes will indeed occur, but it is only moderate. But the curve of both elements of the leucocytes will show the same relation mentioned under Item (2).

II. $\frac{1}{2}$ R.A.U. of yakriton.

If the preparation of yakriton which contained $\frac{1}{2}$ R.A.U. per 1 c.c. is used in the amount of $\frac{1}{2}$ R.A.U. per kilo gram of body weight, then

the change of blood picture within 80 minutes of the injection is as follows:—

- (1) In the case of *b*-classified rabbits:—
 - a) The total number of leucocytes shows almost no change.
 - b) The curves of the myeloid and lymphatic cells will take a lying O or X form or transient forms between these two (Cf. Figs. 11–15). This relation resembles that which will occur in the case of the injection of 1 R.A.U. of yakriton per kilo of body weight, but the initial decrease of the lymphatic elements here is less pronounced than in that case.
- (2) In the case of *f*-classified rabbits:—
 - a) The total number of leucocytes shows almost no change, as in the case of *b*-classified rabbits.
 - b) The curve of the myeloid and the lymphatic cells will take a lying X or V form, because myelocytosis and lymphopenia will occur (Cf. Figs. 16–20).
- (3) In control experiments, the relation of the myeloid and lymphatic elements will take the form of lying V or X.

Conclusions.

From the preceding report (44th Report) and the present paper, we can, if the blood pictures within 3 hours of injection are observed, conclude the following:—

(1) The same yakriton can produce a different blood picture according as a rabbits are *f*-classified (of strong ammonia-detoxicating liver power) or *b*-classified (of weak ammonia-detoxicating liver power).

(2) In *f*-classified animals yakriton will, if subcutaneously injected in large and small amounts ($\frac{1}{2}$, 1 and 10 R.A.U.), produce such a change of blood picture as the physiological saline subcutaneously used, only a quantitatively more marked change, thus qualitatively non-characteristic change.

(3) But in *b*-classified animals, yakriton will, in small amounts (in $\frac{1}{2}$ and 1 R.A.U.), produce a characteristic blood picture (Schema II), while it will in a large amount (10 R.A.U.) produce such a blood picture as it will in the case of *f*-classified animals alone.