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Foa-Kurloff cellen. De invloed van enige hormonen, in het bijzonder geslachtshormonen, op het aantal Foa-Kurloff cellen in het bloed van de cavia

Louwerens, Bernardus

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SUMMARY

In the blood of the guinea pig a cell is found that can most easily be described as a big lymphocyte with one, sometimes two vacuoles. In the bloodsmear, stained according to May Grünwald-Giemsa, this vacuole appears to be filled with filaments or granules consisting of a substance which is stained in about the same way as the nucleus. After the investigators who were the first to report on these cells, they are called Foà-Kurloff cells (abbreviated to F.K. cells).

A number of hypotheses have been put forward on the origin and nature of these cells. The most probable one is based on the important fact that the F.K. cells increase after administration of oestradiol and that testosterone is supposed to have a similar effect.

The purpose of our investigation was to obtain more information about the action of sex hormones on the F.K. cells in male and female guinea pigs. In addition by removal of endocrine glands or by administering other hormones we tried to establish if other endocrine organs but sex organs affect the number of F.K. cells. Since there is no agreement about this we finally tried to establish if a correlation existed between the number of F.K. cells and the number of any other cells of the white blood picture.

The substances were always administered subcutaneously. Beginning with the day of injection the blood cells were counted every two days (our schedule was: blood sampling on Monday, Wednesday and Friday, or Tuesday, Thursday and Saturday in the afternoon). We counted the total number of the white cells and differentiated into lymphocytes, eosinophile granulocytes, other granulocytes and F.K. cells.

Our results, also mentioned at the end of the chapters, were:
Chapter IV.

1. One injection of oestradiol causes a peak in the number of F.K. cells 8 to 14 days after the administration. Whereas in normal guinea pigs about 3 per cent of the white blood cells appear to be F.K. cells, this percentage increases till 8 to 10 per cent after the administration of oestradiol. There also occur peaks from 16 to 20 per cent, but these were exceptions. In the male guinea pig the normal number of 1 to 2 per cent F.K. cells increases after administration of oestradiol till 8 to 10 per cent in about ten days.
2. In the normal female the smallest effective dose of oestradiol lies between 1 γ and 2.5 γ oestradiol per 100 g of bodyweight.
3. Higher dosages do not have a greater effect.

4. Repeated administration of oestradiol does not change the effect mentioned under 1.
5. Normal male animals respond to an administration of oestradiol roughly in the same way as female animals, but the effect on the F.K. cells is of longer duration: whereas in female animals after the highest peak the normal level of the F.K. cells returned in about five days, in male animals it remained high for some weeks after the peak.
6. In the normal female guinea pig testosterone causes a rise in the number of F.K. cells of the same nature as that caused by oestradiol. The effect, however, is less pronounced.
7. Progesterone appeared to have no effect on the number of F.K. cells in the normal female guinea pig.

Chapter V.

8. In the male animal castration has no effect on the number of F.K. cells.
9. Castration does not change the effect of oestradiol.
10. The number of F.K. cells in the female animal decreases after ovariectomy. We failed to observe the temporary increase of the level of the F.K. cells immediately after the operation which is reported by others.
11. Oestradiol raises the number of F.K. cells in the ovariectomized guinea pig, but the effect is less pronounced as the time between the operation and the injection of oestradiol is longer.
12. Subcutaneous implantation of two tablets of 25 mg of oestradiol benzoate in ovariectomized animals caused a peak of the number of F.K. cells, which is similar to the peak after one injection of oestradiol in the normal female. After the peak the level of the F.K. cells remains increased for some time. After removal of the implant the number of F.K. cells decreased. This decrease is not preceded by an increase (compare 10).
12. In dosages up to 0.5 mg per 100 g of bodyweight testosterone has no effect on the number of F.K. cells in ovariectomized guinea pigs.
13. In ovariectomized animals, which level of the F.K. cells was maintained on about 3 per cent of the number of white blood-cells by means of an oestradiol benzoate implant, testosterone proved to have no effect on the number of F.K. cells.

Chapter VI.

15. Neither adreno-corticotrophic hormone (ACTH) nor desoxycorticosteronacetate (DCA) were able to affect the number of circulating F.K. cells in the normal female guinea pig.
16. Removal of the adrenal glands did not change the number of F.K. cells in the female guinea pig.
17. Hypophysectomized females respond to one injection of oestra-

diol with a rise of the number of F.K. cells, as mentioned under 1.

18. After hypophysectomy the F.K. cells gradually disappear from the blood.
19. Administration of adrenaline does not change the number of F.K. cells in normal females.
20. After removal of the uterus (in only two animals) oestradiol had a prolonged action.

Chapter VII.

21. Together with the increase of the number of F.K. cells there always occurs a rise in the number of granulocytes and the subsequent decrease of the F.K. cells is likewise accompanied by a decrease of the granulocytes. On the contrary this does not mean that the number of F.K. cells increases when there is a rise in the granulocytes caused by some other reason.

Chapter VIII.

22. No correlation was found between the number of F.K. cells and other cells of the white blood picture.
23. Intravenous administration of 2 ml serum obtained from a guinea pig with a number of F.K. cells in the blood of more than 10 per cent, increased the number of granulocytes of the normal female guinea pig. On the contrary serum obtained from an animal with few F.K. cells in the blood caused a tendency towards decrease of the number of granulocytes.

On the basis of these data it is concluded:

1. Oestradiol has a direct effect on the number of F.K. cells.
2. Testosterone probably has an indirect effect on the number of F.K. cells. This hormone is supposed to stimulate the secretion of oestradiol by the ovary.
3. As far as investigated other hormones have no effect.
4. The increase of the oestradiol concentration of the blood is probably the stimulus which caused the rise of the number of F.K. cells.
5. The optimal dose of oestradiol is nearly the same as the minimal dose.

Finally a hypothesis was put forward about the importance of oestradiol to the origin and maintenance of the F.K. cells and a few suggestions were given for continuing the investigations.