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The Monocytic Reaction in Virus III Disease.

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A study of the circulating blood cells has been made on normal rabbits and on rabbits inoculated with various disease-producing agents including virus III. This filterable virus, indigenous to rabbits, causes well marked lesions of the testicle, skin, and scarified cornea when injected at these sites. In the experiments with this virus, the blood was studied at frequent intervals before and after inoculation by means of quantitative determinations of the red and white cells with standardized pipettes, hemoglobin estimations (Newcomber haemoglobinometer), and differential white cell counts of the fresh blood with the supravital technic (vital neutral red).

Three experiments have been carried out. Fresh testicular tissue showing a well developed virus III lesion was ground with sand and normal saline under aseptic conditions and 0.2 or 0.3 cc. of a thick emulsion was injected into one testicle or intracutaneously in the shaved skin of the side of the body. The first experiments comprised 5 normal rabbits which were inoculated intracutaneously and in one testicle; the second series of 5 normal rabbits were inoculated intracutaneously; in the third group, 8 rabbits which had previously been inoculated with a malignant tumor were injected intracutaneously.

The outstanding feature of the observations made was a very marked increase in the number of circulating monocytes, as is shown in the accompanying graph (Fig. 1), which illustrates the findings in the first experiment. In the other series, the results were of the same order but were somewhat less marked, due presumably to the less pronounced reaction associated with the intracutaneous as contrasted with the intratesticular route of inoculation. The results, considered upon a group basis, are recorded as percentage variations from the mean values of 4 counts taken during the week preceding inoculation.

The increase of monocytes, amounting in this instance to 312%, was observed on the fifth day after inoculation at a time when the lesions were at their height of development and when a febrile reaction was present. On the 8th and 9th day, the count had returned to its pre-inoculation level and by this time the lesions had regressed

and were practically healed. In the second and third experiments, the corresponding monocytic increase was 234 and 243% respectively, and in both instances the maximum occurred 5 days after inoculation. Observations were not made on the fourth day in the first and second experiments, but in the third series the counts on the second and fourth days were similar and the monocytic rise occurred abruptly on the fifth day.

An increase of circulating large mononuclear cells has been ob-

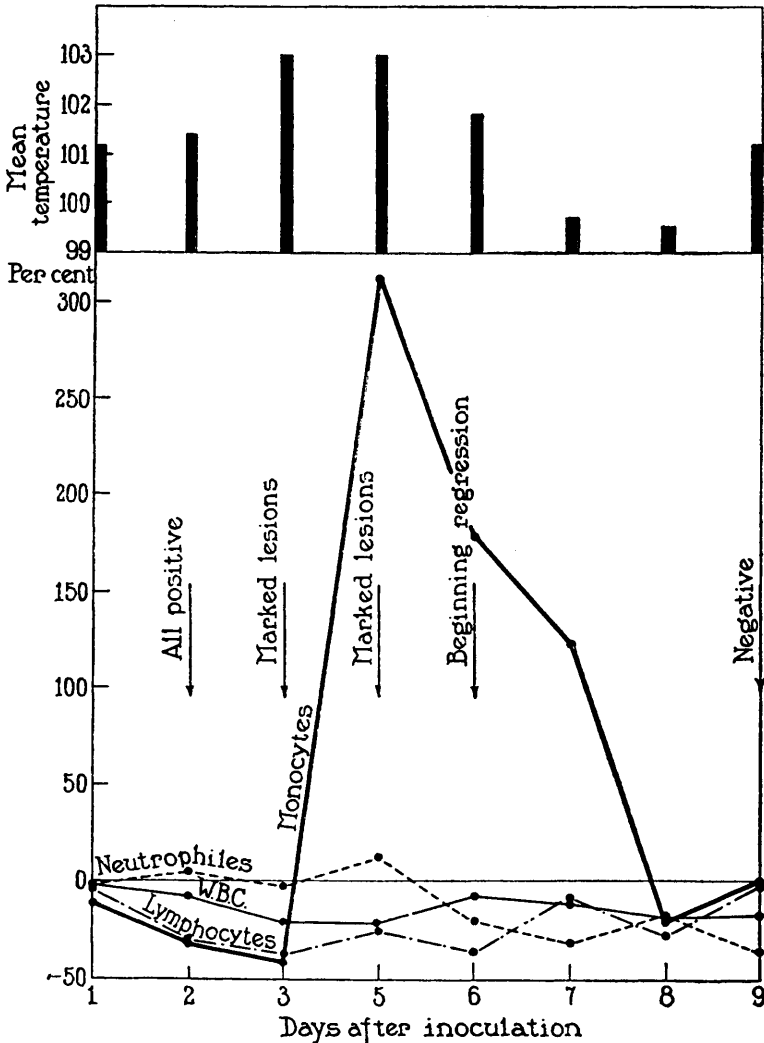


FIG. 1.

Monocytic Reaction in Virus III Disease. Percentage variations from the mean values before inoculation.

served in various diseases, as for example, in tuberculosis, measles, syphilis, vaccinia, and small pox. There is evidence to indicate that in some, if not in the majority of these cases, examination of the fresh blood by the supravital technic would show that many of the cells classified as large mononuclears are monocytes. If this be true, it is reasonable to assume that some feature of the disease process common to these diverse conditions is associated with or responsible for the monocytosis, and the suggestion is here made that a proliferative phase of the general reaction may be the feature in question.

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The Monocytic Reaction in Neoplasia of the Rabbit.

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A study has been made of the cells of the circulating blood of normal rabbits and of rabbits inoculated with various disease-producing agents^{1, 2} including a transplantable malignant neoplasm³ believed to be of epithelial origin. The results concerning the monocytes in this condition are referred to in the present report.

A variable number of blood counts were taken preceding inoculation and thereafter for 2 months, at which time the experiments were arbitrarily terminated by killing all surviving animals. For the most part, the blood was examined at weekly intervals; a differential white cell count with the supravital technic (vital neutral red) was made at each examination. Six experiments comprising 47 rabbits have been carried out from October, 1927, to March, 1929. In each experiment, a suspension of fresh tumor tissue in normal saline was injected in one testicle of young adult male animals. The course of the disease was followed clinically and the autopsy findings furnished further information concerning the extent and degree of the disease process.

The blood observations have been analyzed with respect to the clinical and postmortem findings and in the present instance, are considered from a group standpoint. The following classification

¹ Pearce, L., and Casey, A. E., *PROC. SOC. EXP. BIOL. AND MED.*, 1929, xxvi, 666.

² Casey, A. E., *PROC. SOC. EXP. BIOL. AND MED.*, 1929, xxvi, 670.

³ Brown, W. H., and Pearce, L., *J. Exp. Med.*, 1923, xxxvii, 601.