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Chronic Uterine Distention in Oestrin-Treated Rabbits.*†

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When the uterus of an untreated, ovariectomized rabbit is distended for 2 weeks with a paraffin pellet of suitable size a certain degree of growth takes place.[1] The amount of growth depends in part upon the amount of stretching to which the uterus is subjected. As shown by the curve, the pellet must be more than one-half and less than twice the size (cross-sectional area) of the undistended uterus (including the lumen)[1] to be an effective stimulus. The present experiments were carried out to learn the effect of chronic uterine distention *in uteri* of ovariectomized rabbits which were first enlarged under the influence of 800 r.u. of oestradiol over a period of 2 weeks. The pellets were left *in utero* for 2 weeks and an additional 400 r.u. of oestradiol was given. The tissues were obtained and the degree of growth ascertained in the manner previously described.[1]

In the present work, the range of distention was at one extreme a uterus:pellet ratio of 3½ and at the other, a uterus:pellet ratio of somewhat less than one-half (Fig. 1). Twenty-six distention sites from 15 different rabbits were obtained. The distribution of these points is shown in Fig. 1, curve A, along with the percentage increase or decrease of the distended portions of the uterus relative to the undistended parts. Curve B is the form of the growth curve obtained in untreated, ovariectomized rabbits.[1]

The present results show, therefore, that the effect of oestrin acting upon a chronically distended uterus is to reduce markedly the capacity of the uterus to grow in response to the stimulus of distention. At the left of curve A, it will be seen that the distention sites are smaller than the undistended parts of the same uterus. Clearly, therefore, a summation of the growth responses resulting from distention and the growth resulting from the action of oestrin is not found in these experiments. Furthermore, it is found that

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† A full report of these findings will be given in a paper at The Biological Laboratory, Cold Spring Harbor, during the summer of 1937, as part of a Symposium on Internal Secretions. Publication will be made with the Proceedings of that Symposium.

[1] Reynolds, S. R. M., and Kaminester, S., *Am. J. Physiol.*, 1936, **116**, 510.

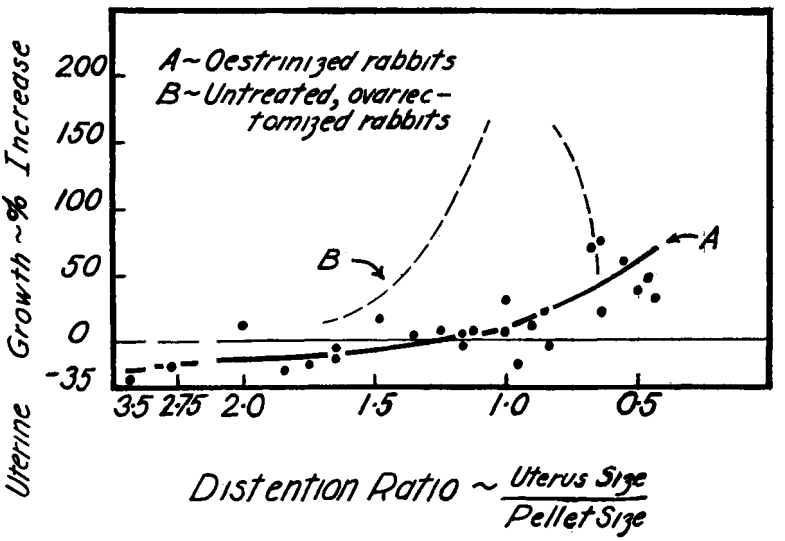

FIG. 1.

throughout nearly the whole range of distentions in the present experiments, the endometrium at the distention sites is smaller than is the endometrium at the undistended sites, while the myometrium usually shows some growth, especially with the larger degrees of distention. Even so, the growth is very much less than that observed in the myometrium of untreated, ovariectomized rabbits with comparable degrees of distention.

These effects are best explained on the basis of impoverishment of the blood supply to distended parts of the uterus owing to the increased tonicity of the myometrium under the influence of oestrin associated with the presence of the pellet in the uterus. The physiological significance of these results in relation to gestation in the rabbit is discussed elsewhere.[2]

Summary. Chronic uterine distention in oestrin-treated rabbits results in a reduction of the capacity of the uterus to grow in response to the stimulus of distention.

[2] Reynolds, S. R. M., *Am. J. Obstet. Gynecol.*, 1937, **33**.