8470 C

# Hormonal Factors Affecting Vaginal Smears in Castrates and After the Menopause.

UDALL J. SALMON* AND ROBERT T. FRANK.

*From the Department of Laboratories and the Gynecological Service, Mount Sinai Hospital, New York.*

Papanicolaou and Shorr[1] have recently described the cytological characteristics of the vaginal smear found in castrates and in women after the menopause. As described by these authors, the smears contain "many leucocytes and a predominance of either non-cornified squamous cells with larger nuclei or of compact cells derived from the deeper layers of the vaginal epithelium, with large well-preserved nuclei."[1] By the administration of estrogenic substance hypodermically these investigators were able, in 14 out of 15 cases, to demonstrate a change in these smears so that they resembled the "follicular (copulative) phase in the normal female."[1] This phase is characterized by "leukopenia and epithelial cells of the squamous type, largely cornified with small pyknotic nuclei."[2] These effects on the smears disappeared several days after cessation of the treatment.

We have recently reported the finding of large quantities of luteinizing factor as well as follicle stimulating factor in both the urine and blood of castrates and natural menopause cases[3] and found that both these factors disappear from the urine and blood following the administration of concentrated estrogenic substance (Progynon-B).[4]

The present investigation was undertaken to determine whether any relationship existed between the type of vaginal smear, the gonadotropic hormone excretion and the symptoms in post-menopause cases and in surgical and X-ray castrates.

A group of 45 cases was studied, consisting of 24 surgical castrates, 11 X-ray castrates and 10 natural menopause. Vaginal smears were taken daily by the patients themselves with small glass

*Joseph Brettauer Research Fellow in Gynecology.

1 Papanicolaou, G. N., and Shorr, E., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 585.

2 Papanicolaou, G. N., *Am. J. Anat.*, 1933, **52**, Supplement.

3 Frank, R. T., Salmon, U. J., and Friedman, R., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 1666.

4 Frank, R. T., and Salmon, U. J., PROC. SOC. EXP. BIOL. AND MED., 1935, **33**, 311.

pipettes. The smears were fixed in methyl alcohol and stained with aqueous fuchsin. Preliminary smears were taken for a period of 5-21 days. Gonadotropic hormone (G.H.) determinations were performed on the urine of 22 cases according to the technique recently reported from this laboratory.[3] After a preliminary period of study of both the vaginal smears and G.H. excretion, 20 of these patients were given a concentrated oily preparation of estrogenic substance intramuscularly (Progynon-B—the benzoic acid ester of dihydro-folliculin).† The estrogenic preparation employed contains 2,000 rat units per cubic centimeter of oil. The dosage used in these cases varied from 4,000 R.U. to 36,000 R.U. given in divided doses of 4,000 R.U. at 3-4-day intervals.

We employed the following criteria for the classification of vaginal smears.

I—Preponderance of leucocytes associated with a large number of oval shaped epithelial cells containing large nuclei ("compact cells").

II—Predominance of squamous epithelial cells; variable number of compact cells and leucocytes.

III—Squamous epithelial cells in large numbers; few leucocytes; total absence of compact cells.

IV—Large squamous epithelial cells with clear staining small nuclei; no leucocytes; no compact cells.

A I or II reading was interpreted as a negative phase; a III or IV reading as a positive phase.

During the preliminary period of observation we found consistently negative smears, (that is the I or II readings), in 18 of the 45 cases. In 14 cases the smears varied from I to III readings during the preliminary period of observation. Persistently positive smears (III and IV readings) were found in 13 cases (7 surgical, 2 X-ray castrates and 4 spontaneous menopause).

G.H. was found in the urine of the 22 cases in which the determinations were made. The G.H. excretion varied from 5 to 100 R.U. per day. There was apparently no relationship between the type of vaginal smear and the quantity of G.H. excreted.

In regard to the symptoms, we found no correspondence between the type of smear and the number or intensity of the flushes. Four of the cases that had the most severe menopause symptoms had consistently positive smears during the preliminary period, whereas 4 cases with typical negative smears had no flushes, whatsoever.

† This material was obtained through the kindness of Dr. Gregory Stragnell of the Schering Corporation, Bloomfield, N. J.

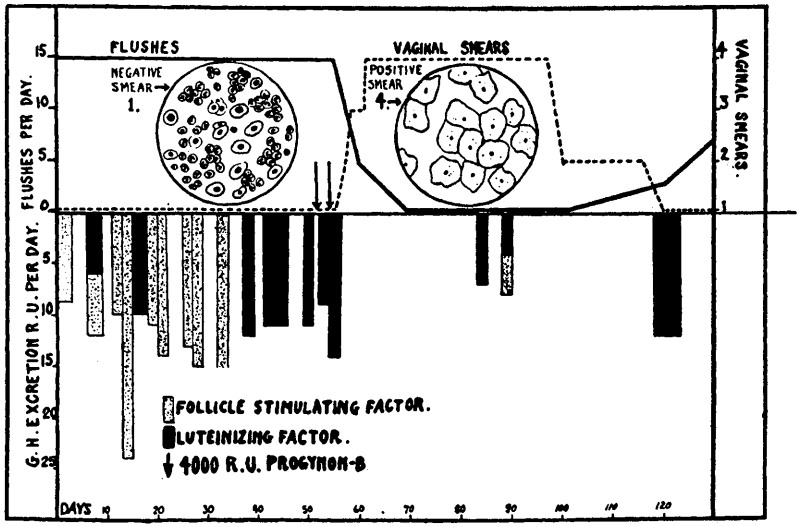


FIG. 1.

Effect of estrogenic substance (Progynon-B) upon vaginal smear, G.H. excretion, and symptoms of a surgical castrate.

Patient—age 50—three years after hysterectomy and bilateral salpingo-oophorectomy. Moderately severe symptoms, 15 flushes daily.

Following the administration of progynon-B, the smears of those cases which had been negative, changed to a IV within 5 days. This maximum effect lasted for about 4 weeks. Return to the preliminary negative phase occurred gradually during the course of 6-10 weeks after treatment. In cases with preliminary III smears, after the Progynon-B injection, these changed to IV.

Amelioration of symptoms coincided with the change to the IV smear. Gradual recurrence of symptoms ran parallel with regressive change in the smear to the preliminary phase.

From these studies it appears that in only about 40% of castrates and post-menopause cases do we find uniformly negative smears. In about 30% of the cases, variations from a negative to a positive phase occurred. In the remaining 30% of the cases persistently positive smears are found even if taken daily over a period of 2 weeks.

Whereas in untreated cases there does not appear to be any correspondence between the severity of the symptoms and the character of the smear, nevertheless, following the administration of adequate amounts of estrogenic substance, striking changes occur in the vaginal smear concomitant with the amelioration of symptoms. Recurrence of symptoms ran parallel with the gradual return of the smear to its preliminary status.