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Comparatively Low Levels of Oestrin in Cases of Chorioepithelioma and Hydatidiform Mole.

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Although there have been numerous reports of the findings of tremendous amounts of the anterior-pituitary-like hormone (A.P.L.) in the blood and urine of cases of hydatidiform mole and chorioepithelioma, we have found no mention of determinations of oestrin in these patients, and it has even been assumed[1] that the oestrin is also very high. This assumption is presumably based upon the fact that in pregnancy both of these hormones are easily demonstrable.

In the course of our quantitative studies of A.P.L. and oestrin in pregnancy, we have had access to the blood and urine of 4 cases of chorioepithelioma, 3 of them males. The same methods of analysis as those previously described[2] have been used. The results in Table I demonstrate that although the blood and urine of these patients contain a higher concentration of A.P.L. than is ever found in normal pregnancy, the oestrin content is very low, in fact not demonstrable without concentration of the specimens by extraction. In cases 3 and 4, 700 cc. of urine were extracted according to the method of Kurzrok.[3] The amount of oestrin excreted in 24 hours is somewhat more than that of the normal men whose urines we have extracted by the same method, about the same as that of a case of testicular embryoma, but by no means comparable with the amount usually found even in very early pregnancy.[4]

Case 1, a woman who was admitted to the Free Hospital for Women dying of chorioepithelioma, received intravenously 27 cc. of a special preparation of Theelin (kindly supplied by Parke, Davis and Company) containing 1000 r.u. per cc. A drop in the A.P.L. level in both blood and urine followed. Oestrin still was not demonstrable in 5 cc. of serum, however, and the urinary excretion

[1] Geschickter, C. F., Lewis, D., and Hartman, C. G., *Am. J. Cancer*, 1934, **21**, 828.

[2] Smith, G. V., and Smith, O. W., *Am. J. Physiol.*, 1934, **107**, 128.

[3] Kurzrok, R., and Ratner, S., *Am. J. Obst. and Gyn.*, 1932, **23**, 689.

[4] Smith, G. V., and Smith, O. W., to be published in *Surg., Gyn. and Obst.*, 1935.

TABLE I.
Quantitative analyses of A.P.L. and oestrin in blood and urine of cases of chorioepithelioma.

Case	Clinical record	A.P.L		Oestrin	
		Serum r.u. per 100 cc.	Urine r.u. per 24°	Serum	Urine r.u. per 24°
1 Female	Chorioepithelioma with metastases				
	7/11/33	10,000	14,000	Negative with 5 cc.	Less than 100
	7/21/33	10,000	15,000	Negative with 5 cc.	Less than 64
	7/21-24/33—27000 r.u. Theelin i.v.				
	7/24/33—1 d. after Theelin	3,300	8,200	Negative with 5 cc.	95
	7/28/33—4 d. after Theelin Died in P. M.		10,500		105
2 Male	4/13/32—Had embryoma of testis and a lymph gland which had chorioepithelioma surgically removed. Since then has been receiving X-ray Blood and urine 7/13/33	10,000	3,700	Negative with 5 cc.	Less than 100
3 Male	Chorioepithelioma of testis	10,000	9,200	Negative with 10 cc.	26
4 Male	" " "	2,000	7,500	Negative with 10 cc.	21

TABLE II.
Quantitative analyses of A.P.L. and oestrin in one hydatidiform mole compared with those in the placentas from 4 interrupted pregnancies.

Materials analyzed	A.P.L		Oestrin	
	r.u. per gm. of dried powder		r.u. per gm. of dried powder	
Hydatidiform mole Began flowing at 3 months Mole passed at 6 months	Sample 1 120	Sample 2 180	Sample 1 0	Sample 2 0
	Maternal portion	Fetal portion	Maternal portion	Fetal portion
Placenta from hysterectomy at 2½ months	12	24	0	4
Placenta from hysterectomy at 4 months	18	30	0	8
Placenta from induced miscarriage at 5 months	9	3	10	10
Placenta from spontaneous miscarriage at 6 months	20	20	10	10

after injections was very much less than would be expected. Similar results followed the oral administration of 24,000 r.u. of Progynon to a woman 8 months pregnant and with the high A.P.L. of late

pregnancy toxemia.[2] (Case 21.) Conversely, a drop in the level of oestrin has been demonstrated following the administration of A.P.L. to cases of threatened miscarriage.[5] These findings might be interpreted as indicating a mutually antagonistic reaction between A.P.L. and oestrin, and the lack of oestrin in cases of chorioepithelioma may be due to the inhibition or destruction of this hormone by tremendous amounts of A.P.L.

In Table II the A.P.L. and oestrin contents of 4 placentas from pregnancies interrupted between the 2nd and 6th months are compared with those of a hydatidiform mole. The same methods of extraction were employed as those described in the analyses of term placentas.[6] There was a marked excess of A.P.L. in the mole but oestrin was not demonstrable.

These few results do not prove that oestrin may never be present in larger amounts in the blood and urine of cases of chorioepithelioma and mole. In female cases in which there are associated luteal cysts that may contain as high as 10,000 m.u. of oestrin per liter of fluid,[7] one would certainly expect increased amounts in the blood and urine, but even then the tumor would not be the source. At autopsy our Case 1 did not have cystic ovaries. The data presented indicate that the chorionic cells themselves, when they become neoplastic, do not contain oestrin in amounts comparable with those in the normal placenta.

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An Analysis of Rate and Amplitude of Breathing.

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Gaseous mixtures of low oxygen content following double vagotomy in the dog produced an augmentation of tidal air with little or no change in rate of breathing. After carotid gland denervation and section of the pulmonary branches of the vagus nerve, which leaves the chemically sensitive aortic nerve endings intact, the effects of anoxemia are similar, but not as great as those following double

[5] Smith, G. V., and Smith, O. W., *J. Am. Med. Assn.*, 1931, **97**, 1857.

[6] Smith, G. V., and Smith, O. W., to be published in *Surg., Gyn. and Obst.*, 1935.

[7] Siegmund, H., *Wien. klin. Wchnschr.*, 1931, **44**, 1045.