

Free Estrone in Urine (False Positive Richardson Pregnancy Test) In Association with Ovarian Tumors. (19563)

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(Introduced by A. J. Goldforb.)

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Richardson(1) has recently described a chemical test for pregnancy, based upon the identification of free estrone in the urine by a color reaction with 2,4-dinitrophenylhydrazine. A high degree of accuracy has been claimed for this test(1,2). The test, as described, is simple, rapid, and economical. If it were as accurate as claimed, it would have many advantages over the usual biological test methods.

It was, therefore, decided to run the chemical method in comparison with the 2-hour rat test(3-6), based on rat ovary hyperemia reaction to chorionic gonadotropin, augmented by a pituitary synergist.

Methods and results. The following report is based on 100 consecutive cases, examined

by the two methods. All urines used were first morning specimens. In the 100 cases studied, 15 were negative by both tests; 66 were positive by both; 14 were positive by the chemical method, negative by the biological; 5 were negative by the chemical, positive by biological test. This gives an over-all accuracy of 81%, with 17.5% false positives.

The disagreements are listed in Table I. In 10 of the 14 cases, in which positive chemical tests and negative biological tests were obtained, ovarian masses were clinically suspected. The pregnancy tests had been ordered originally to rule out the possibility of pregnancy before abdominal exploration. In 8 of these 10 cases, ovarian tumors were found at operation. In 2 others, ovarian tumor is still

TABLE I. Discrepancies Between Chemical and Biological Tests.

Patient	Age	Pregnancy test Chem.	Rat	Clinical symptoms and/or diagnosis	Pathological findings	Confirmation of pregnancy
S.	35	+	—	Amenorrhea 1 mo. Pain in abdomen	Pseudomucinous cystoma	Hysterectomy; not pregnant
U.	24	+	—	Backache, nausea, vomiting—few days	Dermoid cyst	At operation: small, non-pregnant uterus
L.	44	+	—	? Myoma uteri or ovarian mass	Bilateral papillary serous cystadenocarcinoma of ovaries, with met- astases	Clinically not preg- nant
B.	33	+	—	Ovarian cyst	Bilateral dermoid cyst	Clinically not preg- nant
D.	27	+	—	Palpable "	Parovarian cyst	Curettage showed pro- liferative endomet- rium. Not pregnant
J.S.	31	+	—	Pain in L.L.Q. Pal- pable ovarian mass	Ovarian "	Previous bilateral tubal ligation. Clin- ically not pregnant
C.	21	+	—	Abdominal mass, 3 mo	Serous papillary cystoma	Clinically not preg- nant. Bilateral chronic salpingitis
G.	27	+	—	Palpable cyst on rou- tine examination	Dermoid cyst	Clinically not preg- nant
Z.	26	+	—	Amenorrhea since last pregnancy 7 months before. En- larged ovary by palpation	Not operated	Clinically not preg- nant

Patient	Age	Pregnancy test Chem.	Rat	Clinical symptoms and/or diagnosis	Pathological findings	Confirmation of pregnancy
R.	24	+	—	Questionably palpable enlarged ovary	" "	Previous bilateral tubal ligation. Clinically not pregnant
D.L.	28	+	—	3 mo irregular uterine bleeding; wt loss; hyperthyroidism	Thyroidectomy: hyperplasia	Clinically not pregnant
M.G.	22	+	—	Nausea and vomiting L.M.P. 3 wk before. Acute gastritis		
O.	42	+	—	Amenorrhea		
C.S.		+	—	Uterine bleeding. Received diethylstilbestrol and ant. pituitrin within 24 hr of urine collection		
L.B.		—	+		Curettage 11 days before: viable placental tissue	
M.Z.		—	+	L.M.P.—6 wk before		
M.C.	43	—	+	L.M.P.—5 " "		Clinically pregnant
A.		—	+	L.M.P.—6 " "		
L		—	+	L.M.P.—12 " "		

clinically suspect, but as yet unproven.

The finding of false positive chemical tests for pregnancy in patients having ovarian tumors is both unexpected and of interest. Among the false positive cases reported by Merkel(2) was one with ovarian carcinoma. None of the tumors examined was of the endocrine-functioning types. The tumors represent a considerable variety, but share in common only the replacement of ovarian tissue. It may be that there are associated disturbances of pituitary gonadotropin production with high levels of circulating estrogen, which appears in the urine as free estrone, thus giving a positive chemical test for pregnancy. Possible explanations are under investigation. The reversal to negative following oophorectomy has been studied so far in only one case. A weakly positive chemical test was obtained 7 days after operation; 4 days later it was negative.

Summary and conclusions. 1. The chemical pregnancy test of Richardson and the rat ovary hyperemia test were run simultaneously on 100 consecutively submitted first morning

urine specimens. 2. 81% concordance was found. There were 17.5% false positive chemical tests, 25% false negative. 3. Of the 14 false positive cases, 10 gave clinical evidence of ovarian tumor; 8 of these were confirmed by surgical excision and pathological examination; the other 2 have not been explored. 4. The chemical pregnancy test of Richardson is not sufficiently specific to permit of its general use in the diagnosis of early pregnancy.

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