

Ineffectiveness of Parenteral 17-Hydroxyprogesterone Caproate

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Introduction

Progesterone supplementation may be administered by vaginal or rectal suppositories, rectal suspension, or by injection. Two forms of parenteral "natural" progesterone exist—USP progesterone (P) or 17 hydroxyprogesterone caproate (17OHP). One of the alleged advantages of 17OHP injections versus progesterone is that the latter is a short acting hormone and daily injections are needed whereas the 17OHP injections are generally given at a dosage of 250 mg weekly.

There have been no definite studies however, documenting that this dosage is effective in raising serum P or 17OHP levels or for how long. The present study was aimed at determining the effect on serum levels of P and 17OHP and the duration of the effect following the intramuscular (IM) injection of 500 mg 17OHP caproate.

Materials and Methods

Ten anovulatory women were given 500 mg 17OHP caproate IM and the serum levels of P and 17OHP were obtained 1, 2, 6, 12, 24, 48, 72 and 168 hours later.

The serum P levels were measured by solid phase 125 I radioimmunoassay (Diagnostic Products Corporation, Los Angeles, CA). The quantitative 17OHP levels were measured by double-antibody 125 I radioimmunoassay (Pantex-Division of Bio-Analysis, Santa Monica, CA). Serum P and 17OHP levels were also evaluated in 10 pregnant women 4-5 weeks from conception to control

for any defects in the radioimmunoassay analysis; the serum levels were obtained on days 1, 3 and 7 from when the pregnant patients received their 500 mg injection of 17OHP caproate.

Results

The serum levels of 17OHP and P following the injection of 500 mg of 17OHP along with the same levels obtained from pregnant women are seen in Table I. No significant rise in serum levels of 17OHP or P over baseline are seen at any hour following the injection of 500 mg 17OHP caproate. The levels of 17OHP and P, however, in pregnant women are appropriately elevated indicating no defect in the radioimmunoassay system.

Discussion

The parenteral IM injection of 17OHP caproate has been claimed in double-blind studies to prevent premature labor.^{1,2} Furthermore, it has been suggested as an alternative therapy to progesterone for the treatment of luteal phase defects for therapy for infertility and for the prevention of spontaneous abortion.³

The present studies by failing to demonstrate any significant rise in the serum levels of P or 17OHP either acutely or delayed, casts serious doubts as to the efficacy of this therapy. The possibility may exist that somehow another progestagen is formed that does not cross-react with the radioimmunoassay for 17OHP, but unless this is found, these data strongly suggest that P therapy rather than 17OHP therapy be given for the treatment of infertility, prevention of spontaneous

Table I
Levels of Serum 17 Hydroxyprogesterone and Progesterone Following
500 mg Intramuscular Injection of 17 Hydroxyprogesterone Caproate

Hours	Patient No.									
	1	2	3	4	5	6	7	8	9	10
	<i>Anovulatory Patients</i>									
0	<30;0.2	44;0.3	<30;0.3	37;0.3	34;0.1	<30;0.1	<30	<30;0.1	34;0.2	<30;0.2
1	<30;0.1	31;0.2	<30;0.2	31;0.3	31;0.2	<30;0.2	<30	<30;0.1	44;0.2	<30;0.3
2	<30;0.1	42;0.3	<30;0.4	<30;0.2	31;0.3	<30;0.4	<30	<30;0.1	46;0.1	<30;0.1
6	<30;0.1	37;0.3	<30;0.1	41;0.2	<30;0.3	<30;0.1	<30	<30;0.1	41;0.1	<30;0.3
12	<30;0.2	34;0.1	<30;0.2	40;0.1	<30;0.2	<30;0.2	<30	34;0.1	38;0.2	<30;0.1
24	<30;0.1	40;0.1	<30;0.1	<30;0.2	<30;0.2	<30;0.3	<30	36;0.2	36;0.4	<30;0.2
48	<30;0.1	31;0.2	<30;0.2	34;0.1	32;0.1	<30;0.4	<30	<30;0.1	39;0.2	<30;0.3
72	<30;0.2	33;0.2	<30;0.1	36;0.1	31;0.1	<30;0.1	<30	<30;0.1	31;0.3	<30;0.2
108	<30;0.1	42;0.2	<30;0.2	<30;0.1	<30;0.2	<30;0.1	<30	<30;0.2	35;0.1	<30;0.1
	<i>Pregnant Patients</i>									
0	360;28	302;27	240;22	274;32	345;33	352;37	215;22	303;27	385;36	255;29
24	354;30	285;30	245;25	241;30	353;35	350;38	215;24	314;25	365;32	240;29
72	355;31	291;27	241;26	232;30	341;35	348;38	190;21	319;22	360;32	244;31
168	342;33	280;25	240;23	216;26	350;34	353;37	185;18	308;24	352;33	238;28

The number to the left in each column represents the serum 17OHP concentration in ng/dl, and the number to the right in each column represents the serum progesterone concentration in ng/ml.

abortion or premature labor, or for merely the replacement of progesterone in anovulatory women.

Capsule

No rise in the serum levels of 17 hydroxyprogesterone (17OHP) or progesterone were demonstrated in the serum of 10 anovulatory patients and 10 pregnant patients following 500 mg IM 17OHP caproate.

Summary

The therapeutic use of 17 hydroxyprogesterone caproate (17OHP caproate) which is considered a long-acting naturally occurring progestagen, has been thought to be possibly effective in preventing premature labor or spontaneous abortions. However, following the IM injection of 500 mg 17OHP caproate, no significant rise in the serum 17OHP or

serum P levels could be demonstrated either within hours or days of the injection. Therefore, this data casts serious doubt as to the therapeutic efficacy of this medication.

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References

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