Abstract


Percutaneous progesterone delivery via cream or gel application in postmenopausal women: a randomized cross-over study of progesterone levels in serum, whole blood, saliva, and capillary blood.

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OBJECTIVE: This study aims to investigate the distribution of progesterone in venous whole blood, venous serum, fingertip capillary blood, and saliva after its topical application in both cream and gel formulations.

METHODS: Ten postmenopausal women were randomized to receive 80 mg of progesterone cream or gel applied daily for 14 days, crossing over after a 14-day washout. On the last day of each treatment period, venous blood, fingertip capillary blood, and saliva were sampled frequently for 24 hours after the final application.

RESULTS: After progesterone cream or gel application, serum progesterone levels rose gradually, reaching a peak at 9 and 8 hours, respectively; AUC(0-24) h was significantly higher with cream (12.39 vs 8.32 ng h mL(-1), P = 0.0391). Whole venous blood levels followed a pattern similar to that of serum but were considerably lower. Saliva progesterone showed a peak at 1 and 6 hours after cream and gel application, respectively, and C(max) was comparable with cream and gel. Saliva AUC(0-24) h was substantially higher than the corresponding area under the curve for serum or whole blood but did not differ significantly by delivery method (39.02 and 58.37 ng h mL(-1), P = 0.69). In capillary blood, C(max) was reached at the same time (8 h) and was similar with both formulations; AUC(0-24) h was also similar with both formulations (1,056 ng h mL(-1) for cream and 999 ng h mL(-1) for gel) but was dramatically higher than the corresponding areas under the curve for venous serum and whole blood.

CONCLUSIONS: After application of topical progesterone, saliva and capillary blood levels are approximately 10-fold and 100-fold greater, respectively, than those seen in serum or whole blood. High capillary blood and saliva levels indicate high absorption and transport of progesterone to tissues. Reliance on serum levels of progesterone for monitoring topical dose could lead to underestimation of tissue levels and consequent overdose.

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