URINARY STEROID EVALUATIONS FOR MONITORING OVARIAN FUNCTION IN INDIAN AND BLACK RHINOCEROS

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Urinary steroid conjugate excretion levels and patterns were studied in zoo-held black and Indian rhinoceros for two years to establish practical techniques to assist in the management of captive rhinoceros breeding and to aid in the diagnosis of fertility problems in female rhinoceros. The primary objectives were to establish normal steroid conjugate values for the rhinoceros estrous cycle and to develop a method of determining and monitoring pregnancy. A urinary estrone sulfate (E1S) radioimmune assay (RIA) was developed and utilized for monitoring ovarian follicular activity. Urinary pregnanediol - 3 - glucuronide (Pdg) was analyzed by specific RIA as an indicator of circulating progesterone. Estrous cycles and pregnancy urine samples from the two rhinoceros species were analyzed for both conjugates.

Steroid conjugate analyses permit the complete endocrine characterizations of the Indian rhinoceros estrous cycle. The Indian rhino female demonstrates a clear evaluation of E1S, considered to be a preovulatory rise, prior to behavioral estrus. The E1S elevation is followed by a sustained elevation of urinary Pdg, believed to reflect corpus luteum activity. Considerable variation in conjugate levels exists amongst individuals and between cycles of a single individual, requiring analysis of serial samples from each animal to confirm status. The single Indian rhinoceros pregnancy monitored demonstrates Pdg levels increasing over luteal phase levels by three months post conception and remaining elevated until immediately prior to parturition.

In the black rhinoceros, E1S and Pdg levels and patterns provided no clear indication of estrous cycle activity. The seven black rhinoceros pregnancies monitered demonstrate Pdg levels rising above baseline levels six months post conception. Pdg levels remain elevated through pregnancy until immediately prior to parturition.

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