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Abstract: Thyroxine (T) is vital hormone for the development of mammals. To determine the role of maternal thyroid hormones on organ development, methimazole, And inhibitor of T, was first administered via a minipump to 13 mothers with pouch young at days 10 and 80 post partum for 28 days. Three young survived and 10 of the young died at 104.0 +/- 10.8 days post partum (mean,SEM). Methimazole was then administered for 28 day to 6 lactating adult possums with pouch young at day to 20 post part partum. The effects of this treatment on the maternal plasma concentration of T were monitored and the development of the lung, kidney and brain of the young were examined at day 90 post partum. There was no difference in the morphology of the lung, kidney and brain of the pouch young at day 90 post partum whose mothers were treated with methimazole or saline. Thus methimazole administered to lactating possums for a short period early in lactation can cause the demise of the young about day 100 post partum although the cause of death is unknown. It is possible that the central nervous system or some other vital organ has been inhibited, this altered state not being apparent morphologically. Nevertheless the marsupial appears to be similar to the eutherian in its requirement for thyroxine for normal development. However whereas this requirement is apparent during fetal development and around the time of birth in eutherians thyroxine is of importance during pouch development in marsupials.

Key word: Marsupial, Brushtail possums, Thyroxine, Methimazole, Development,Lung, Kidney,Brain.

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