

SERUM LEVEL OF THYROID HORMONES DURING LATE PREGNANCY AND POST LAMBING IN AWASSI SHEEP

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ABSTRACT

Pregnant awassi ewes (n=17) were used to determine serum level of T₃ and T₄ starting at the last 3- 4 days of pregnancy and continued at 2,6,10,14,18 weeks and 22 weeks post lambing (PL) .

The concentration of TSH (thyroid stimulating hormone) were determined at 14,18 and 22 weeks post lambing .

Results showed a general trend of depression in T₃ levels during most of the tested periods, however the decrease in T₄ level was significant (p < 0.01) at 6 week (PL) and significant increase(p<0.05) in its level was registered at 10 week PL. Levels of TSH showed significant increase (p< 0.05) at 14 - 22 weeks PL.

INTRODUCTION

The thyroid gland facilitate normal growth and maturation of animal by maintaining the level of metabolism in tissues at an optimal rate for normal function Rajan (12) and Mycek et al (8).

It is well known that the reproductive system of both male and female animals requires normal amount of thyroid hormones for adequate function choksi et al (3). Severe hypothyroidism is often associated with infertility Krassas et al (6). In pregnant animal thyroid hormones are important not only for the development of the fetus but also for the viability of the pregnant mother itself Burrow (2).

In lactating females series of hormonal interaction are needed to maintain normal lactation including availability high thyroid hormonal level koch et al (7).

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MATERIALS AND METHODS

Pregnant awassi ewes (n=17) 3-4 years old from the flock of the state board for agricultural research at shuala station, Baghdad were used in the study.

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Received: July/1999

Accepted: Dec./2004

They were housed with the rest of the flocks in free stalls with normal ambient temperature, and were allowed to graze on pastures but were also fed concentrates and hay daily.

Blood samples were collected via the jugular vein starting at the last 3-4 days of pregnancy and continued during 2,6,10,14,18 and 22 weeks after lambing. Sera were separated by centrifugation at 1500 rpm for 10 minutes and stored at -20°C until assayed.

Hormonal assay: serum triiodothyronine (T_3), thyroxine (T_4) and thyroid stimulating hormone (TSH) concentration were measured by radioimmunoassay (RIA) using readily available kits (Amersham International, U.K). TSH measurement were done only on 14-22 weeks after lambing. Duncan test were used to evaluate the significance of differences between the various periods of study.

RESULTS AND DISCUSSION

T_3 hormone: Levels of this hormone were high during the last 2-4 days before lambing, however, sharp drop in T_3 level was noticed 14 week after lambing (Figure 1) which was found to be significantly ($p < 0.01$) lower than all other the tested periods. Beside, there was no significant difference in other T_3 level in other periods.

T_4 hormone: Results showed significant decline ($p < 0.01$) at six week after lambing (Figure 2), however, there was sharp increase at 10 week after lambing which was significantly ($p < 0.05$) higher than all other levels which in turn didn't show significant difference.

TSH Level of this hormone were measured only during post lambing period. there was gradual increase in TSH levels starting from 14 week post lambing up to 22 weeks which was statistically significant ($p < 0.05$).

DISCUSSION

Values obtained in the present study concerning thyroid hormones during various reproductive states studied in awassi sheep are comparable to values reported by other authors concerning others breed of sheep Anderson et al (1). High level of both T_3 and T_4 seen during the last 2-4 days of pregnancy may indicate an increase in maternal metabolism to provide necessary physiological requirement for the big task of parturition on one hand, and for the preparation of initiation of lactation on the other hand.

These results are in agreement with similar observations noticed in other mammalian species Glinoe et al (5), Nissim et al (9) and O'Leary et al (10). Moreover an increase in estrogen level during late pregnancy is known to be associated with an increase in total serum thyroxine level in ewes Anderson et al (1).

The marked depression of T_3 and T_4 (6 to 14) weeks post lambing may be due to mammary gland drain of iodine leading to decrease in the availability of this important element of the thyroidal hormones biosynthesis (Vanjonak and Johnson (13)). Moreover the time between the appearance of the decrease of T_4 at (6 weeks post lambing) and T_3 (4 weeks post lambing) may indicate greater rate of T_4 conversion to T_3 Ganong (4) thus maintaining T_3 level for longer period.

The increase in TSH level at week 14 post lambing (Figure.3) seem to coincide with the start of T₃ increase (Figure.1) and is probably due to the reason behind T₃ increase. It is well known that pituitary TSH stimulate thyroid hormones synthesis Porth (11).

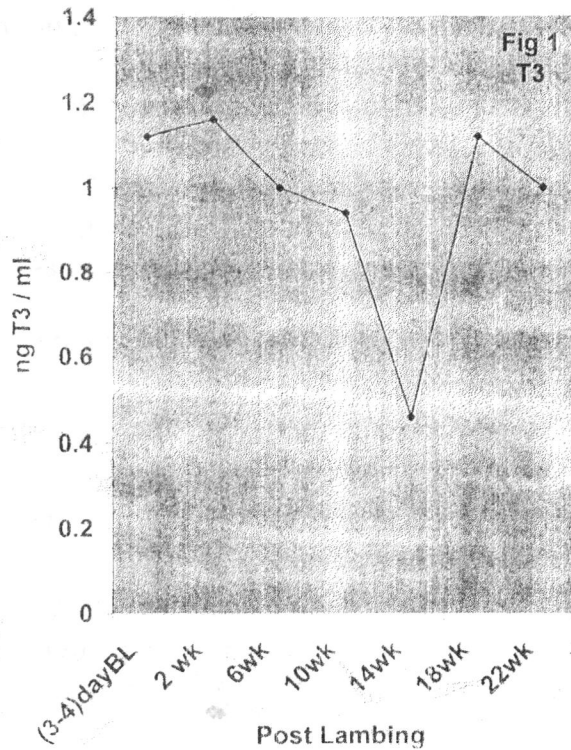


Figure1: Serum T3 Concentration in Awassi Ewes Before and Post Lambing.

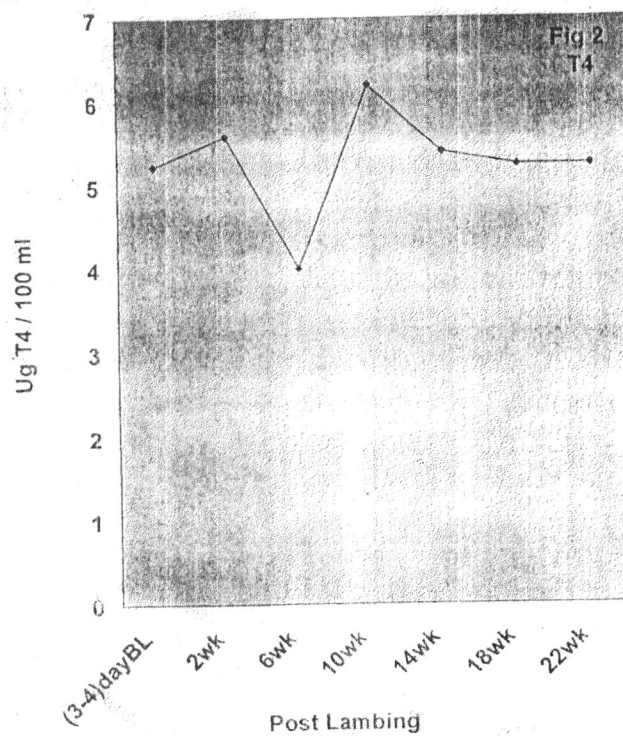


Figure2: Serum T4 Concentration in Awassi Ewes Before and Post Lambing.

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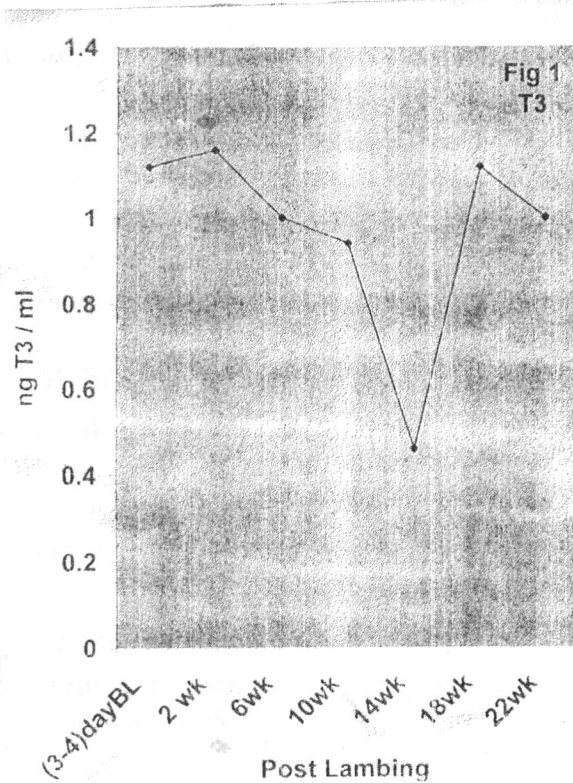


Figure1: Serum T3 Concentration in Awassi Ewes Before and Post Lambing.

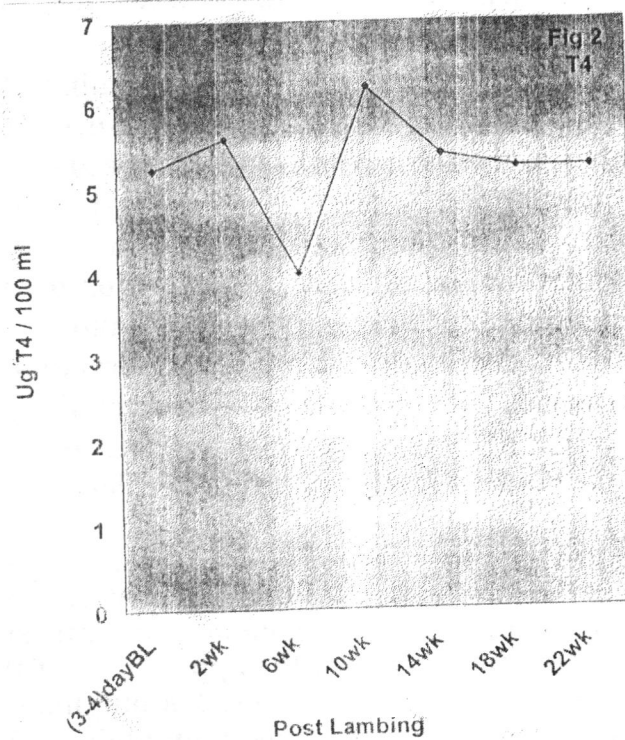


Figure2: Serum T4 Concentration in Awassi Ewes Before and Post Lambing.

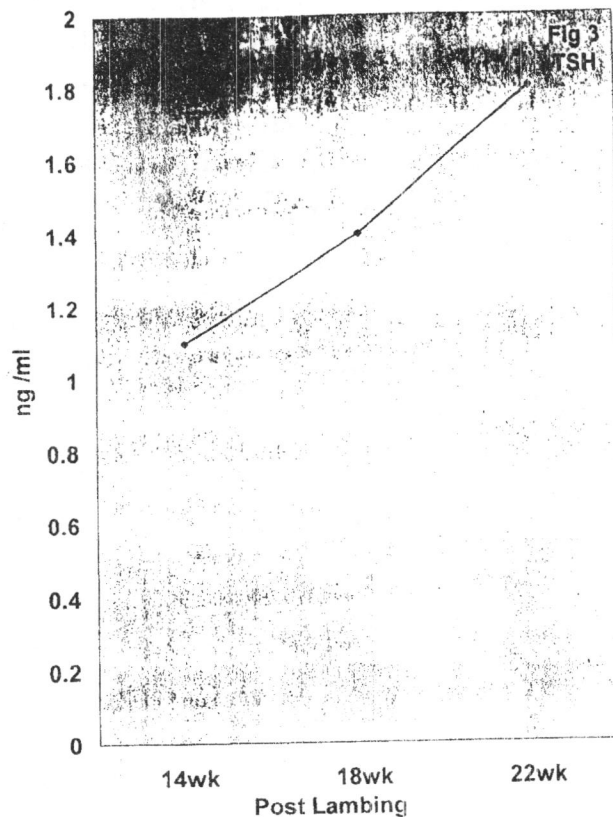


Figure3: Serum TSH Concentration in Awassi Ewes Post Lambing.

Results of the present investigation provide useful information on thyroidal secretion in awassi ewes just before and immediately post lambing. These information's may be important in better understanding of the hormonal situation in ewes during lactation.

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مستويات الهرمونات الدرقية عند الحمل المتقدم وبعد الولادة

في أمصال الأغنام العواسية

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الملخص

تم قياس مستويات هرمون الثايروكسين الثلاثي اليود (T_3) والدرقين (T_4) في مصل الدم من مجموعة ١٧ نمجة عواسية خلال الايام ٣-٤ الاخيرة من الحمل واستمر القياس خلال الاسبوع ٢، ٦، ١٠، ١٤ و١٨ بعد الولادة. كما تم قياس الهرمون الخفز للدرقية (TSH) عند الاسبوع ١٤، ١٨ و٢٢ بعد الولادة. اظهر مستوى هرمون T_3 انخفاضاً واضحاً خلال معظم مدد الدراسة. اما مستويات الدرقين فقد سجلت انخفاضاً معنوياً ($P<0.01$) خلال الاسبوع السادس وزيادة معنوية ($P<0.05$) عند الاسبوع العاشر بعد الولادة. وظهر هرمون TSH زيادة معنوية ($P<0.05$) للمدد من ١٤-٢٢ اسبوعاً بعد الولادة. بينت هذه الدراسة اهمية هرمونات الدرقية في الحمل المتأخر وبعد الولادة ووفرت معلومات جديدة عن هذه الهرمونات في النعاج العواسية.

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