التأثيرات الحيوكيماوية المصاحة للإجهاض الطبيعي في الماعز

-byة ناجم، راوف حلمي، فليال الفار، محمد عبد الناصر محمد، أحمد مصطفى

تم عزل كل من فطر الموسوي وجرامينيوم، كلادوسورم والبنسيا. ومن أجل تجنُب مركزاً استخدمت في تغذية الماعز أثناء فترة الحمل.

وقد أدت ذلك إلى إجهاض عدد 16 ماعز من 134 رأس وقد أوضحت التحاليل الحيوكيماوية لعينات المصل المأخوذة من الماعز التي أجهشت بالمقارنة بمثيلتها، أن وقعت زيادة طبيعية (زيادة في كل من البروتينات الكلي والجلويبولين وكذلك نقص في نسبة الألبومين / جلوبرولين وكذلك نقص في الليف القناعي بروستاجلاندرين، بينما لم تظهر تغييرات جوهرية لكلا من الكالسيوم والفسفور الغير عضوي والكاروتين وفيتامين (أ) وفيتامين (ه) والبروجسترون والاستراديول 17 ب بين المجموعتين.
SERUM BIOCHEMICAL CHANGES IN RELATION TO MYCOTIC ABORTION IN GOATS
(With One Table)

By
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SUMMARY

Fusarium graminearum, cladosporum spp. pericillium spp. were isolated from concentrated ration fed to pregnant goats. Sixteen goats out of one hundred - thirty two aborted. Biochemical analysis of sera from aborted and normal parturient goats, revealed a significant increase in total protein and total globulins and a significant decrease in albumin/globulin ratio and prostaglandin F2α in the first group than the other one.

Serum calcium, inorganic phosphorus, Carotien, Vitamin A, Vitamin E, progesterone and estradiol 17-B showed no significant variance between the two groups.

INTRODUCTION

Abortion in goats as in other large domestic animals is due to a wide variety of infectious and non-infectious agents. In most flocks an incidence of one to five percent abortion is considered acceptable (WATSON, 1962). Higher rates of abortion should be carefully investigated.

Fungi have been rarely described as a cause of abortion in goats and ewes. In Japan, pregnant goats aborted after feeding wheat infected with Fusarium graminearum (URAGUCHI, 1971). CYSEWSKI, PIER and RICHARD (1968) detected mycotic abortion in ewes produced by Aspergillus fumigatus. In cattle, the incidence of mycotic abortion varied from 0.5 to 16 percent of all abortions.

Hence, the disease was reported in many parts of the world and many species of Aspergillus, yeast and other pathogenic fungi were incriminated as the causation of bovine abortion (AINSWORTH and AUSTWICK, 1973). Other reports (WILLIAMS; SHREEVE; HEBERT and SWIRE, 1977; LAING, 1979 and SINHA; SHARMA and MEHROTRA, 1980) indicated that Aspergillus species were most commonly associated with mycotic abortion followed by Mucor and Absidia.

Regarding the blood biochemistry and abortion in goats, MORGENTHAL (1966) studied the haematology of the Angora goat with special reference to habitual abortion. ZAGHLoul, ABDEL-AAL and NAFIE (1985) investigated the blood biochemical alterations of goats with chlamydial abortion. On the other hand, no systemic study in relation to mycotic abortion was performed. In this investigation we recorded the first attempt to isolate fungi as a causative agent of abortion in goats and correlate this finding with serum biochemical changes.
MATERIAL and METHODS

Sixteen goats out of a one hundred—thirty two pregnant does in the Breeding Station at Sakha, Kafr El-Sheikh province, aborted (12.12%), three to four months of gestation, during the period of December 1984 to January 1985. They were of various parities and breeds (Demashky, Albine and Balady).

High incidence of abortions occurred in Demashky breed (9 out of 38, i.e. 56.25%). While the incidence of abortions in the other two breeds, Albine and Balady, were three out of total 56 (5.36%) and four out of total 38 (10.53%), respectively. The animals are of good healthy condition without any symptoms of illness except congestion of the vulva in some aborted cases. Retention of placentas occurred only in one aborted case. The animals were kept in open sheds away from kids and fed concentrates and Trifolium alexandrium.

Swabs from vaginal discharge and parts of placenta were obtained for microbiological and viral examinations. Samples from concentrates were tested for fungi. Serum samples were taken from all the aborted goats plus five parturient goats for the microbiological (brucellosis), viral (Rift Valley fever) and biochemical investigation. These samples were obtained within 24 hours after abortion or parturition. Blood smears were also taken for parasitic examination.

Procedures used in this investigation were:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total protein, albumin and globulin</td>
<td>Weichselbaum (1946) and Bartholomew and Delaney (1966).</td>
</tr>
<tr>
<td>Calcium</td>
<td>Clandler and King (1972).</td>
</tr>
<tr>
<td>Inorganic phosphorus</td>
<td>Kilchling and Freiburg (1951).</td>
</tr>
<tr>
<td>Carotene and Vitamin A</td>
<td>Kaser and Steko (1943).</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>Quadle and Biehler (1945).</td>
</tr>
<tr>
<td>Progesterone</td>
<td>Sharma (1972).</td>
</tr>
<tr>
<td>Mycological isolation</td>
<td>Halely and Callaway (1979).</td>
</tr>
<tr>
<td>Statistical analysis</td>
<td>Snedecor and Cochran (1967).</td>
</tr>
</tbody>
</table>

RESULTS

No specific microorganisms or virus were isolated from the taken samples.

Blood smears showed no parasitic infestation. Fungi were isolated in pure culture from the concentrated ration. These included Fusarium graminearum, cladosporum spp. and penicillium spp.

Serum biochemical analysis (table 1) revealed a significant increase in the total protein and total globuline and decrease in albumin/globulin ratio in aborted goats than in normal parturient ones.

Hormonal values in aborted goats were the same as in normal births except PGF2α, which was not increased and the difference was significant (P< 0.01). No significant variance was recorded in serum calcium, inorganic phosphorus, carotene, vitamin A and vitamin E, between aborted and normal parturient goats.

MYCOTIC ABORTION IN GOATS

DISCUSSION

Fungi isolated from concentrates (Fusarium graminearum, cladosporum spp. and penicillium spp.) were strongly implicated as the causative agent of abortion in goats. This finding was in accordance with that reported in goats (URAGUCHI, 1971), in ewes (CYSEWSKI, et al. 1968) and in cows (WILLIAMS, et al. 1977; LAING, 1979 and SINHA, et al. 1980). LIW, XIE, WANG, LI, LIU, LIU, CAO and ZHANG (1985) reproduced clinical symptoms and pathological changes in sheep and goats with Fusarium, Aspergillus and Penicillium from forage. Herein, the isolates exercise their pathogenic effect by invasion of the foetal and placental tissues and interference with the nutrition of foetus and foetal death has been occurred. It is also possible for abortion to be the result of mycotoxicosis. CHRISTENSEN, NELSON and MIROCHA (1965) and MIROCHA, CHRISTENSEN, NELSON, SIMONELLA and STANZANI (1967) determined that Fusarium graminearum produced an oestrogenic metabolite like substance. MARCATO, ACCIARRI, SIMONELLA and STANZANI (1972) induced severe uterine hypertrophy in immature male mice by injection of pure culture of Fusarium, Aspergillus niger and penicillium. KALLELA and ETTLA (1984) reported that early abortion in cows caused by the oestrogenic fusarium toxin (Zearalenone) in hay.

Exogenous oestrogen represented by the mycotoxin of fusarium graminearum was responsible for the increase of plasma estradiol 17-B in our aborted cases. Its level was similar to that observed in spontaneous labour (table 1), which led to luteal regression and withdrawal of the plasma progesterone.

The source of PGF₂α appearing before foetal delivery is not known but a placental origin seems likely. It may be released in response to an increased influence of oestrogen (CURRIE, COX and THORBURN, 1976) or perhaps less likely directly in response to chronic exposure to increased corticosteroids. The significant low level of PGF₂α in aborted cases in our study (10.50±1.528 ng/ml) may be due to immaturatation of adrenal cortex of foetal goats in this stage of gestation (CURRIE and THORBURN, 1977).

The plasma progesterone concentration determined in this study (table 2) for post-parturient goats was about 0.53 ng/ml which is similar to values reported previously (UMO, FITZPATRICK and WARD, 1976 and CURRIE and THORBURN, 1977). The aborted goats had a progesterone concentration that was indistinguishable from that of the goats delivered normally. Apparently, the decrease in progesterone concentration acts as a trigger for the start of uterine contractions which are necessary for expulsion of the foetus. The withdrawal of progesterone which precedes the foetal delivery is clearly indicative, in the goats of luteal regression (CURRIE and THORBURN, 1977). The events which are clearly in common are the major increase in plasma corticosteroids in the foetus and the episodic appearance of PGF₂α in the utero-ovarian vein ipsilateral to the ovary with the corpus luteum. The level of the plasma PGF in this study was 30.84±5.55 ng/ml in normal birth. CURRIE and THORBURN (1973) demonstrated that the concentration of PGF in utero-ovarian plasma at the time of luteal regression is 5-25 ng/ml providing a potent luteolytic signal in goats.

The significant increase in serum total protein and its globulin fraction (table 1), indicate the presence of infectious agent. The effect on vitamin A level was only obvious in Demashey breed which significantly decreased than in normal birthes, 72.93±4.58 VS. 106.63±1.39 IU/100 ml. Lindburg, GROHN and KARPPANEN (1985) suggested that changes in vitamin A metabolism are caused by fusarium mycotoxins in feed.

REFERENCES


Currie, W.B. and Thorburn, G.D. (1977): Parturition in goats studies on the interactions between the foetus, placenta, prostaglandin F and progesterone before parturition at term or at parturition induced prematurely by corticotrophin infusion of the foetus. J. Endocr. 73, 263-278.


Mycotic Abortion in Goats


Table 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal parturient goats</th>
<th>Aborted goats</th>
</tr>
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<tbody>
<tr>
<td>Progesterone (ng/ml)</td>
<td>0.530± 0.022</td>
<td>0.576± 0.017</td>
</tr>
<tr>
<td>Estradiol 17-B (pg/ml)</td>
<td>249.400± 1.280</td>
<td>246.440± 1.340</td>
</tr>
<tr>
<td>Prostaglandin F (ng/ml)</td>
<td>30.840± 5.550</td>
<td>10.500± 1.530**</td>
</tr>
<tr>
<td>Total protein (gm/100 ml)</td>
<td>7.390± 0.840</td>
<td>8.590± 0.290*</td>
</tr>
<tr>
<td>Albumin (gm/100 ml)</td>
<td>2.730± 0.110</td>
<td>2.660± 0.089</td>
</tr>
<tr>
<td>Globulin (gm/100 ml)</td>
<td>4.660± 0.330</td>
<td>5.860± 0.240**</td>
</tr>
<tr>
<td>A/G Ratio</td>
<td>0.590± 0.027</td>
<td>0.460± 0.021**</td>
</tr>
<tr>
<td>Calcium (mg/100 ml)</td>
<td>10.340± 0.370</td>
<td>10.140± 0.290</td>
</tr>
<tr>
<td>Inorganic-P (mg/100 ml)</td>
<td>6.890± 0.460</td>
<td>6.800± 0.360</td>
</tr>
<tr>
<td>Carotenoids (ug/100 ml)</td>
<td>11.730± 0.770</td>
<td>12.540± 0.590</td>
</tr>
<tr>
<td>Vitamin A (ULU/100 ml)</td>
<td>106.630± 1.890</td>
<td>100.550± 7.970</td>
</tr>
<tr>
<td>Vitamin E (ug/100 ml)</td>
<td>715.000±27.500</td>
<td>726.770±21.890</td>
</tr>
</tbody>
</table>

Mean ± Standard error.
* : Significant at P/ 0.05.
** : Significant at P/ 0.01.