NUTRITIONAL MUSCULAR DYSTROPHY AS A CAUSE OF LOCOMOTOR DISTURBANCE IN OSSIMI LAMBS

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ABSTRACT

A total of 40 lambs were included in the present investigation. Twenty of them showed locomotor disturbances in the form of unsteady gait, stiffness in rear quarters and fore limb muscles with arched back and muscular tremors if forced to standfor few minutes and diagnosed clinically and biochemicaly as Nutritional Muscular Dystrophy (NMD). The remaining 20 lambs were apparently clinically healthy lambs and used as control group. Serum biochemical analysis of diseased lambs revealed, highly significant increase in the serum enzyme activities Aspartate aminotransfrase (AST) and creatine phosphokinase (CPK)with the mean values of (884.6 ± 984 and 637.5±306 IU/L) in comparison with(116.3±19.1 and 148±13.7 IU/L); respectively in control group. On the hand the pointed to a significant depletion in serum selenium which is the cause of the disease the mean value of (58±13.4 ug/dL)in diseased lambs, in comparison with control group (145±17.05 ug/dL)in healthy ones. treatment trial with selenium and vitamin E revealed improvement of general health condition, with disappearance of clinical findings and improvement of all parameters towards the normal limits . Finally it could be concluded that Selenium and Vitamin E supplementations are essential for protection of lambs from nutritional muscular dystrophy.

Key words: *Vitamin E and Selenium, Sheep, Locomotor disturbances.*

INTRODUCTION

Some minerals and vitamins deficiencies has led to severe locomotor impairment and losses in the offspring, of them is vitamin E and selenium. Selenium and vitamin E are micronutrients which protect the cells against the injurious effect of lipid peroxides and free radicals produced during normal cellular oxidative metabolism. So they had remarkable similar effects in indueing (NMD) **(Kennedy et al., 2000).** Since vitamin E and selenium are one of the most common causes of locomotor disturbances in lambs, the present study was planned to evaluate the most appropriate methods of diagnosis, studying the effect of Se and Vitamin E as a cause of locomotor disturbance in lamb and application of some treatment trials to such diseased sheep.

Materials and Methods

A total of twenty lambs, of both sexes, from different localities in the period between December 2009 to February 2010, were exam-

ined. These lambs showed sings of nutritional muscular disease including unsteady gait, stiffness in rear quarters, neck and for limb muscles and arched back. Another twenty lambs were apparently healthy were selected during the same period of examination and were considered as control for this study. NMD was diagnosed based on ease history, clinical findings as well as biochemical investigations.

Two blood samples were taken via Jugular vein puncture. The first sample was allowed to flow freely and gently from the puncture into clean dry glass containers, and centrifuged at 3000 rpm for 10 minutes, only clean non hemolyzed sera were harvested and kept frozen at -4°C until further use. Blood sera samples were used for determination of the following of biochemical variables Aspartate aminotransfrase (AST), creatine kinase (CK) as well as selenium (Se). Serum Aspartate aminotransfrase (AST) was estimated by IF cc method without pyridoxal phosphate (p-5-p) and Kinetic UV according to Henderson and **Donald et al. (2001)**. CP was also determined from by stanbis CK-NAC (UV-Rate) for quantitative determination according to **Kachmar and Moss et al. (1976)**. while selenium level was measured by chromatography method according to **Gathwala et al. (2000)**.

Treatment Trails :

The affected lambs were treated by injection of AD3E (Adewa company) at a dose rate of 1ml/10 Kg BW intramuscularly for 10 days with injection of Vestselin (Adewa company) and repeated after one week with addition of ASH minerals mix powder sachet to the feeding .

RESULTS

Lambs under investigation showed a significant decrease of Se level in comparison with control group. Their values were (58±13.4 and 145 ± 17.05 µg/dL, respectively); however, there was a significant increase in AST and CK level (884.6 ± 984.1 and 637.5 ± 306 IU/l) compared to control group (116.3 ± 19.1 and 148 ± 13.7 IU/L).

DISCUSSION

NMD was diagnosed depending on clinical findings and laboratory investigation. Diseased lambs showed clinical findings of unsteady gait, stiffness in rear quarters, neck and for limb muscles and arched back and recumbency (5/20). These findings were in harmony with that reported by **Van Saun et al. (2004)**.

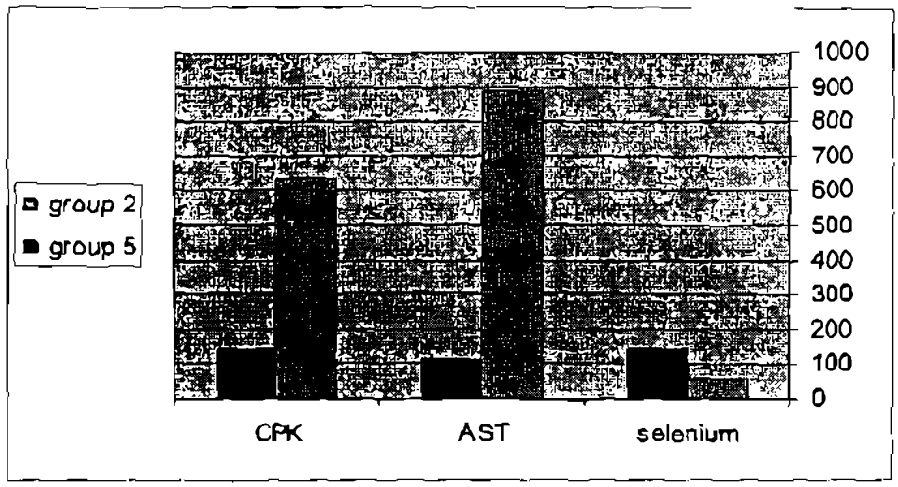
Biochemically, diseased lambs showed a significant decrease of Se level (58 ± 13.4 µg/L) compared to control group (145 ± 17.05 µg/dL). Such finding confirmed our suspicious. however, the significant increase in AST and CK level could be attributed to damages of muscles which result in liberation of these enzyme in the blood stream become more and this due to decrease level of Se. These findings were in accordance with those reported by **Menzies et al. (2004); Van Saun et al. (2004) and Abutarbush et al. (2008)**. Supplementation of the diseased lambs by vitamin E and selenium, induced complete recovery of all lambs. Increasing in CK level is an important indictor for Se level in sheep, this as shown in the diseased lambs. That result similar to that mentioned by **(Cynthia and Kahn et al., 2008)**.

Serum activity of creatine kinase (CK) was highest in the affected lambs level before treatment then decrease after treatment as mentioned (table 2), this result concerning with **Norton et al., (1986)**. The improvement caused by administration of selenium and vitamin E could stop the muscle damage which was cause the clinical sings and increasing the enzymes levels.

Selenium levels increased after treatment is an indication that Se is the cause of NMD and it correct by injection of Se and vitamin E this result has harmony with what mentioned by **Hansen et al.,(1993) and El-Sayed et al, (2000)**.

CONCLUSIONS

It could be concluded that selenium and vitamin E were the cause of appearance of the nutritional muscular dystrophy in lambs. It is suggested that Vitamin E and Selenium supplementation are needed to protect sheep from Nutritional Muscular dystrophy which affect the productivity and activity of sheep.



CK, AST and Selenium in lambs with NMD as well as control group

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الملخص العربى

مرض ضمور العضلات الغذائى كمسبب للاضطراب الحركى فى الحملان الوسيمى

لقد تم فحص حوالى ٤٠ حملاً من أغنام الوسيمى فى هذا البحث، وأظهر ٢٠ حملاً بعض الإضطرابات الحركية ومشية غير متزنة مع تصلب فى عضلات الرجل الخلفية والأقدام الأمامية مع تقوس فى الظهر وهزات تظهر بوضوح فى العضلات عند إجبار الحملان الوقوف لدقائق معدودة وشخصت هذه الحالة بضمور العضلات الغذائى، والعشرون حملاً المتبقية كانت ظهرياً سليمة واستخدمت كمجموعة ضابطة.

بفحص البيوكيميائى السيرولوچى لدم هذه الحملان فى دراسة الكيمياء الحيوية أظهرت زيادة عالية فى مستوى اسبيرت تنزامينيز وكرياتين فوسفات وكانت (٩٨٤±٦ . ٨٨٤ و٣٠٦ ± ٥ . ٦٣٧) على التوالى مقارنة للمجموعة الضابطة التى كانت (١٩±٣ , ١١٦ و ١٣±١٤٨)، ومن ناحية أخرى نقص شديد مستوى السيلنيوم الذى هو المسبب فى هذا المرض وكانت النتيجة كالآتى (١٣ . ٤ + ٥٨) بالمقارنة مع الحملان السليمة (١٧ . ٥ ± ١٤٥).

كل حيوانات هذه المجموعة قد تلقت العلاج من السلينوم وفيتامين هـ وأظهرت تحسناً كبيراً وتعافت ظهرياً كما أظهرت تحسناً كبيراً فى النتائج السيرولوچية التى وصلت إلى الحدود الطبيعية.

وأخيراً يمكن أن نلخص إلى أن إستخدام السلينوم وفيتامين هـ تعتبر ضرورية لحماية الحملان من التعرض لضمور العضلات الغذائى.