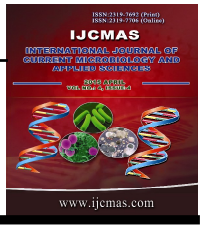
Int.J.Curr.Microbiol.App.Sci (2015) 4(4): 252-255

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 4 (2015) pp. 252-255**
http://www.ijcmas.com



Original Research Article

Variations in the water soluble antioxidative capacity in the blood of sheep

Firas Mahmoud Faleh Hayajneh*

Department of pharmacology, Al Taif University- College of pharmacy,
Al Taif- Al Haweiah, Kingdom of Saudi Arabia
**Corresponding author*

A B S T R A C T

Keywords

Water soluble antioxidative, blood of sheep, Reactive Oxygen Species (ROS)

The aim of this study was to determine changes of the water soluble antioxidative capacity in the blood of sheep during pregnancy and during stress conditions caused by diseases. The blood of 20 female sheep was tested for variations in the water soluble antioxidative capacity, it is clear from the results that the stress caused by pregnancy or disease causes a decrease of the antioxidative capacity when compared to results from the control group.

Introduction

Free radicals are types of Reactive Oxygen Species (ROS), which include all highly reactive, oxygen-containing molecules such as the hydroxyl radical, the super oxide anion radical and hydrogen peroxide (Kohen and Gati, 2000). These molecules are continuously generated inside the animal body as a consequence of exposure to a plethora of exogenous chemicals in our ambient environment and/or a number of endogenous metabolic processes involving redox enzymes and bio-energetic electron transfer (Sreelatha and Padma, 2009). Under normal circumstances, the ROS generated are detoxified by the antioxidants present in the body and there is equilibrium between the ROS generated and the antioxidants present. However, owing to ROS overproduction and/or inadequate antioxidant defence, this equilibrium is hampered favouring the ROS upsurge that culminates in oxidative stress (Kohen and Gati, 2000; kamiloglu, et al., 2006).

Oxidative damage is associated with free radical formation and oxidative stress causes health deterioration (Giannenas et al., 2009), therefore Maintaining a physiological equilibrium between intracellular levels of antioxidants and the production of reactive oxygen species (ROS) is crucial for the survival of the developing organisms (Garrel et al., 2010), Tightly controlled ROS generation appears to be one of the central

elements in the mechanisms involved in cell function, growth, differentiation and death (Valko et al. 2007).

Recent studies suggest that free radicals have been implicated in the development of over 100 diseases affecting all major organs. Reactive oxygen species are chemically reactive molecules containing oxygen. Antioxidants help to defend the body against free radicals, whereas Antioxidants help to defend the body against free radicals. (Puppel et al., 2013).

The use of specific nutrients such as vitamin A and β-carotene to prevent reproductive failure and to protect tissues against the oxidative stress that occurs during steroidogenesis has received much attention recently. It has been suggested that vitamin A and β-carotene, as antioxidants, may play a major role in the protection against the reactive oxygen species (ROS) (Haliloglu Et al., 2002).

Materials and Methods

The diseased blood samples were taken from the clinic Taif region with the help of the responsible veterinarian in the ministry of agriculture, the pregnant and control group blood samples were taken from farms in Taif region, the samples were taken transported and kept until the testing time according to the analytical procedure.

Animals

The experiment was carried out on 20 animals (females), 5 females were pregnant, 10 were suffering from different diseases (7 cases of internal parasites, 3 cases were showing signs of pneumonia, diagnosis was done by the veterinarian in the clinic of the ministry of agriculture in Taif city), 5 control animals.

Analytical procedures

Water soluble antioxidant capacity content was measured spectrophotometrically using a kit from cell biolabs, Cell Biolabs' OxiSelect™ TAC Assay Kit measures the total antioxidant capacity within a sample. Samples are compared to a known concentration of uric acid standard within a 96-well microtiter plate format.

Result and Discussion

It is clear that there is a significant difference between the diseased, pregnant and the control groups. Animals under disease stress have lower water soluble antioxidant capacity (ACW) values, this result agrees with the results shown by (de forge et al., 1993). Pregnant sheep show lower antioxidant activity due to pregnancy stress, the same results for pregnant dairy cattle blood samples were shown by (Hayajneh, 2014),(Fürll et al., 2003) showed similar results of reduced antioxidant capacity in pregnant ewes.

According to the data of (Esmaeilnejada et al., 2013) sheep infected with Babesiaovis parasite have lower antioxidant capacity than control groups. Ascorbic acid level, which is a water soluble antioxidant decreased in infectious diseases because of inappetence and especially decreased the intake of proteins, consequently the immune system will be depressed (Egbenwiyiet al., 2000) Ascorbic acid deficiency can often result in impaired resistance to infectious organisms and decreased immunity status(Hemingway, 1991; Seifi, 1996) because of increased tissue utilization of ascorbic acid, the demand on ascorbic acid increases (Hayajneh, 2014).

	Diseased cases										Pregnant					Control				
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	1	2	3	4	5
Age (Month)	9	11	13	14	15	10	11	18	15	17	17	15	13	14	15	11	13	15	14	18
ACW value (mg/l)	6.9	5.7	5.8	6.4	5.7	6.6	6.8	5.5	5.2	5.01	4.5	5.12	5.07	6	6.02	7.4	6.7	7.8	7	7.2
Disease	1	1	1	1	1	1	1	2	2	2										

1: internal parasites; 2:chronic pneumonia

References

Nadidenabilkamiloglu, ebrubeytut and mesutaksakal, alteration in antioxidant status and lipid peroxidation of sheep previously treated with vitamin a and β-carotene during breeding and periparturient, *bull vet instpulawy 50, 171-177, 2006*

Haliloglu S., Baspınar N., Serpek B., Erdem H., Bulut Z.: vitamin A and β-carotene levels in plasma, corpus luteum and follicular fluid of cyclic and pregnant cattle. Reprod Dom Anim 2002, **37**, 96-99.

Giannenas, I., Pappas, I. I. S., Mavridis, S., Kontopidis, G., Skoufos, J. and Kyriazakis, I. (2009). Performance and antioxidant status of broiler chickens supplemented with dried mushrooms (Agaricusbisporus) in their diet. Poultry Science, 89, 303-311.

Kohen, R. and Gati, I. (2000). Skin low molecular weight antioxidants and their role in aging and in oxidative stress. Toxicology, 148, 149-157.

Sreelatha, S. and Padma, P. R. (2009). Antioxidant Activity and Total Phenolic Content of Moringaoleifera Leaves in Two Stages of Maturity. Plant Foods and Human Nutrition, 64, 303-311.

Nadidenabilkamiloglu, ebrubeytut and mesutaksakal, alteration in antioxidant status and lipid peroxidation of sheep previously treated with vitamin a and β-carotene during breeding and periparturient, *bull vet instpulawy 50, 171-177, 2006*

Ruiz de Gordoa J.C., Bu stamante M., Arran z J., Virto M., Barrón L.J.R., Beltrán de Heredia I., Amores G., Abilleira E., Nájera A.I., Ruiz R., Albisu M., Pérez-Elorton do F.J., Man dalu n iz N. I n crease i n watersol u bl e total an tioxidan t capacity of sheep' s mi l k as a resu l t of i n creased grazi n g time. In : Ran illa M.J. (ed.), Carro M.D . (ed.), Ben Salem H. (ed.), Moran d-Feh r P. (ed.). Challenging strategies to promote the sheep and goat sector in the current global context. Zaragoza : CIHEAM / CSIC / Un iversidad de León / FAO, 2 011 . p. 2 67 -2 7 1 (Option s Méditerranéen n es :Série A. SéminairesMéditerranéen s; n . 9 9).

Kamila Puppel, Teresa Nałęcz-Tarwacka, BeataKuczyńska, MarcinGołębiewski and Marta Kordyasz, Effect of different fat supplements on the antioxidant capacity of cow's milk, ArchivTierzucht 56 (2013) 17, 178-190.

Catherine Garrel, Paul A Fowler and Kaı¨s H Al-Gubory, Developmental changes in antioxidant enzymatic defences against oxidative stress in sheep placentomes, Journal of Endocrinology (2010) 205, 107–116.

De Forge LE, Preston AM, Takeuchi E, Kenney J, Boxer LA,Remick DG. Regulation of interleukin-8 gene expressionby oxidant stress. J BiolChem 1993; 268: 25568–25576.

Firas MahmoudFalehHayajneh, Effect of pregnancy stress on the antioxidative capacity in dairy cattle, Journal of Experimental Biology and Agricultural Sciences, June - 2014; Volume – 2(3),323-327.

B. Fürll, H Wilken and M Fürll, Water-Soluble Antioxidant in Ewes During Their Late Pregnancy, ActaVeterinariaScandinavica 2003, 44(Suppl 1):P125

ValkoM., Rhodes C. J., Moncol J., IZakovic m., Mazur M., Telser J., 2007 − Free radicals and antioxidants in normal physiological functions and human disease. The International Journal of Biochemistry & Cell Biology 39, 44-84.

Bijan Esmaeilnejada, Mousa Tavassolia, SiamakAsri-Rezaeib, Bahram Dalir-Naghadehb, Hassan Malekinejadc, Ghader Jalilzadeh-Aminb,J afar Arjmanda, Mostafa Golabia, Naser Hajipour., Evaluation of antioxidant status, oxidative stressand serum trace mineral levels associated with Babesiaovis parasitemia in sheep. Vet. Parasitol. (2014), http://dx.doi.org/ 10.1016/j. vetpar. 2014.07.005

Egbenwiyi TN, Nwaosu SC, Salami HA (2000). Haematological values of apparently healthy sheep and goats as influenced by age and sex in arid zone of Nigeria, Afr. J. Biomed. Res.; vol 3; 109-115.

Hemingway DC (1991). Vitamin C in the prevention of neonatal calf diarrhea. Can. Vet. J.; 32: 184.

Seifi HA, Mokhber DMR, Bolurchi M (1996). The effectiveness of ascorbic acid in the prevention of calf neonatal diarrhoea. J. Vet. Med. B.; 43: 189-191.

Firas Mahmoud FalehHayajneh, Plasma ascorbic acid levels in sheep infected withhydated cyst, Merit Research Journal of Agricultural Science and Soil Sciences (ISSN: 2350-2274) Vol. 2(9) pp. 111-113, September, 2014.