Kufa Journal for Veterinary Medical Sciences Vol.4 No.2 (2013) 40-44

Kufa Journal for Veterinary Medical Sciences
www.vet.kufauniv.com

Evaluation levels of IgG and some biochemical parameters in water buffalos vaccinated with HS vaccine in Al-Qassem Town

*Basim H. AbedAli [(1)] **Hassan Kh. Ulaiwi
*Ali H. Jaber

*Assistant lecture, M.Sc. theriogenology, Veterinary Medicine College, Al-Qadisiya University
**Lecture, M.Sc. pathology, Veterinary Medicine College, Al-Qadisiya University
E-Mail: basim_mmm5@hotmail.com [(1)]

Abstract:

The current study was conducted on sixteen water buffalos to evaluate some serum enzymes, metabolic product, bilirubin and minerals during the last period of pregnancy and the effect of pregnancy on level of IgG after immunization with HS vaccine. The buffalos were divided equally into two groups: pregnant group (P) and control group (C), each group included eight buffalo. Thirty two blood samples were taken buffalos, sixteen samples from each group; between each drew one month intervals. All buffalos of group (P) were in the last period of pregnancy. The buffalos were vaccinated with HS vaccine. Bilirubin, Alanine Aminotransferase (ALT), gamma-glutamyl Transferase (GGT), potassium (K^+), Creatinine and urea were examined by using Reflatron apparatus, as well as IgG concentrations were determined by radial immunodiffusion plate (IgG RID). The results revealed that there were no difference between levels of bilirubin in treated (0.670±0.057) and control (0.762± 0.151) group, ALT levels showed a significant differences between pregnancy group (10,42±0.481) and control group (24.92±0.507), GGT levels revealed no significant differences between pregnancy (7.23±0.59) and control (7.57±0.92), the levels of K^+ revealed slightly difference between Pregnancy (5.58±0.96) and control (3.67±0.48), creatinine levels in pregnancy group also showed mild increase in levels (5.66±0.83) as compared with control group (2.63±0.64), while serum urea concentrations were within the normal rang (50 mg/dl±0.72).The result showed that there were a significant differences between the first and second intervals of study ($P<0.05$). The mean of IgG protein concentrations were (677.076±0.79 mg/dl). The conclusion that the concentrations of IgG in pregnant buffalo vaccinated with HS was not affected by pregnancy and remained within normal values during the last period of pregnancy, while some parameters including liver enzymes, kidney bilirubin and minerals function affected more than others during last period of pregnancy, while the IgG concentrations were still within normal levels during pregnancy periods.

Key Words: IgG, Biochemical parameters, HS vaccine, Buffalo.

تقييم مستوى البروتين المناعي IgGوبعض معايير الكيمياء السريرية لمصل الدم في جاموس الماء الممنع بلقاح الانتان الدموي في مدينة القاسم

*باسم حميد عبد علي **حسن خلف عليوي
*علي حبيب جابر

*مدرس مساعد، ماجستير تناسلية بيطرية، كلية الطب البيطري، جامعة القادسية
**مدرس، ماجستير علم الامراض البيطرية، كلية الطب البيطري، جامعة القادسية

الخلاصة:

أجريت الدراسة الحالية على ستة عشر جاموسة محلية لتقييم بعض خمائر مصل الدم والمنتجات الأيضية و البيليروبين والمعادن خلال الفترة الأخيرة من الحمل وتأثير الحمل عل مستويات البروتين المناعي نوع IgG بعد التمنيع بلقاح الحمة النزفية. وقسمت الحيوانات الى مجموعتين متساويتين: مجموعة الحوامل (P) ومجموعة السيطرة (C)، سحبت (32) عينة دم من الجواميس خلال الفترة الاخيرة من الحمل ،ستة عشر عينة من كل مجموعة ، بين كل سحبة فترة شهر واحد اي بواق ثمانية عينات في السحبة الواحدة. منعت الجواميس الحوامل بلقاح الإنتان النزفي HS. فحص البيليروبين، وخمائر الكبد (ALTو GGT)،والبوتاسيوم K، والكرياتينين واليوريا باستخدام جهاز الرفلاترون Reflatron. ولم تظهرت النتائج أية فروقات بين مستويات البيليروبين في مجموعة الحوامل (0.057 ±0.670) والسيطرة (0.151±0.762)، بينما اظهرت النتائج وجود فروقات معنوية مهمة بانخفاض مستويات خميرة ال ALTوهي فروق ذات دلالة إحصائية بين مجموعة الحمل (0.481±10،42) ومجموعة السيطرة (0.507±24.92)، أما مستويات خميرة ال GGT فقد كشفت الدراسة عدم وجود فروقات ذات دلالة إحصائية بين مجموعةالحوامل (0.5 ±7.23) والسيطرة (0.92±7.57)، كما كشفت مستويات البوناسيوم + K فرقاً قليلا بين مستوياته في مجموعة الحمل (0.96±5.58) مقارنتاً بمجموعة السيطرة (0.48±3.67)، في حين كانت مستويات الكرياتينين في مجموعة الحمل قد ارتفعت ارتفاعاً بسيطاً (0.83±5.66) مقارنة مع مجموعة السيطرة (2.63 ± 0.64)، بينما لم تتأثر تراكيز يوريا مصل الدم وبقيت ضمن المعدلات الطبيعية في كلا المجموعتين (0.72±50 ملغ / دل). لم تظهر الدراسة وجود اختلاف بين الفترة الاولى والثانية للدراسة (P <0.05). وكشفت نتائج الدراسة أن معدل تركيزات البروتين المناعي IgG كانت (0.79±677.076 ملغ / دل) وهي ضمن المعدلات الطبيعية. استنتجت الدراسة: بأن مستوى المناعة لدى الجواميس الحوامل التي منعت بلقاح ال HS لم يتأثر بالحمل وبقي ضمن المعدلات الطبيعية كما ان بعض معايير الدم بما في ذلك خمائر الكبد و البيليروبين وعنصر البوتاسيوم تتأثر أكثر من غيرها خلال الفترة الأخيرة من الحمل.

الكلمات المفتاحية: للبحث: مستوى البروتين المناعي IgG، معايير الكيمياء السريرية، لقاح الانتان النزفي، الجاموس.

Introduction:

The buffalo is an important dairy animal in many developing countries, because of their high disease resistance and the opportunities of milk production despite feeding with low quality roughage (1).There is an increase demand for energy enable the fetus and placenta to growth during pregnancy, due to excessive demand the metabolism of all nutrient will be effected(2). During pregnancy abnormal liver function test including (bilirubin, AST, ALT) are occasionally reported (3). The biochemical changes reflecting liver dysfunction that may lead to preeclampsia, obstructive cholestasis, HELLP syndrome and acute fatty liver of pregnancy (4). Some studies revealed that alterations were observed in concentrations of glucose, total protein, blood urea nitrogen, as well as, cholesterol, tryglesiride during pregnant and lactating buffaloes(5).

Hemorrhagic septicemia (HS) is a commonly fatal systemic disease of cattle and buffaloes caused by infection with *Pasteurella multocida* serotype B: 2(6). The disease is peracute, having a short clinical course involving severe depression, pyrexia, submandibular edema, and dyspnea, followed by recumbency and death. HS in buffaloes is a cause of major economic losses and ranked as the primary fatal disease in Asian countries, although the immune response to *P. multocida* is poorly understood, but vaccination are

administered parenterally, require repeated administration, but are not sufficiently efficient (7).

Study design and Methods:

The study was carried out on a group of buffalos breed located in the Al-Qassem Town. For the study Thirty two buffalo of the average age of 3±1.6 years and the average weight of 250.2±3.3 kg were used. The animals were all in nutritional and health good state. Diet was based principally on grazing on the land cultivated to Alfalfa and natural grass, integrated with 500 g/ head of concentrated commercial food. During the night the animals were kept in the pen where they were provided to hay and water *ad libitum*. The animals were divided according to period of blood withdrawn into two groups: pregnant group (P), eight pregnant buffalos and control group (C), eight lactating buffalos (Postpartum period).The buffalos were vaccinated with HS vaccine (VAROL MEDIKAL COMPANY-Turkey) and the blood samples were withdrawn before vaccination and after one month from vaccination. The group C was vaccinated after 0ne month from delivery and the blood samples were withdrawn before and after one month from vaccination. Blood was immediately centrifuged at 3000 rpm for 10 minutes at 25°C of temperature and the obtained plasma was stored at 8°C. Plasma levels of urea, Bilirubin, ALT, GGT, K and Creatinine were determined using Reflatron apparatus. IgG protein concentrations were also determined by radial immunodiffusion plate (IgG RID) (8).

Statistical analysis:

The data were expressed as mean ±standard error (SE) and analyzed using analysis of variance (ANOVA). Least significant difference (LSD) was used to test for differences among means for ANOVA indicated a significant ($P<0.05$), using computerized SPSS (9).

Results and Discussion:

The results revealed that there were no difference between levels of bilirubin in treated (0.670±0.057) and control (0.762± 0.151) group, ALT levels showed a significant differences between pregnancy group (10,42±0.481) and control group (24.92±0.507), GGT levels revealed no significant differences between pregnancy (7.23±0.59) and control (7.57±0.92), the levels of K+ revealed slightly difference between Pregnancy (5.58±0.96) and control (3.67±0.48), creatinine levels in pregnancy group also showed mild increase in levels (5.66±0.83) as compared with control group (2.63±0.64), urea levels were within the normal ranges with no variances between pregnancy and control group (50 mg/dl±0.72 and 46±0.83 respectively).The result showed that there were a significant differences between the first and second intervals of study ($P<0.05$) (the table). The results revealed that IgG protein concentrations were (677.076±0.79 mg/dl) that similar to concentration of control group (699.088±0.10 mg/dl) (the table). Our results were indifference with researchers that indicate bilirubin concentrations were excess 4 µM in the 3rd -4th month of pregnancy (10),and others Indicate that there were no significant differences in the concentrations of total protein during pregnancy and lactating periods (11), regarding serum urea, it was higher in pregnant buffaloes. The values of serum blood urea are considered to be an indicator of total protein intake. Serum enzymes AST, ALT and ALP were significant increased especially ALP during pregnancy period. Also the result of current study differs from these that indicate blood plasma urea, creatinine, total lipids, cholesterol, triglycerides, glucose, GOT and GPT concentration of pregnant buffaloes showed non-significant differences between the different experimental groups (12). Our results were differs from that revealed IgA and IgG

raise at the beginning of pregnancy and decrease after 17th week (13), while other indicate that The mean IgG level in normal pregnant women was lower than in non-pregnant women(14).

Table represents levels of some serum parameters in (mg/dl) in pregnant and non-pregnant buffalo after vaccination with HS vaccine:

	Type of parameter	T G	CG
1	bilirubin	0.670±0.057	0.762± 0.151
2	ALT	10,42±0.481[a]	24.92±0.507
3	GGT	7.23±0.59	7.57±0.92
4	K^+	5.58±0.96 [b]	3.67±0.48
5	creatinine	5.66±0.83 [b]	2.63±0.64
6	urea	50 ±0.72	46±0.83
7	IgG protein	677.076±0.79	699.088±0.10

- The results represent means±SE.
- Small letter (a) represent high significant differences between the groups (P<0.05).
- Small letter (b) represent little significant differences between the groups (P<0.05).

References:

1. Bertschinger, H.J. (1996). Reproduction in the African Buffalo: A review. In BL Penzhorn (Ed.), Proceedings of a symposium on the African Buffalo as a game ranch animal. Pretoria: Wildlife Group of the South African Veterinary Association: 62-74.

2. Ch'ng, C.L.; Morgan, M.; Hainsworth, I. and Kingham, J.G. (2002). Prospective study of liver dysfunction in Southwest Wales. *Gut.;* 51:876-80.

3. Rahman, T.M. and Wendon, J. (2002). Severe hepatic dysfunction in pregnancy. *QJM*.; 95:343-57.

4. Saftlas, A.F.; Olson, D.R.; Franks, A.L.; Atrash, H. and Pokras, R.(1990). Epidemiology of preeclampsia and eclampsia in the United States. *Am J Obstet Gynecol*.; 163:460-5.

5. Ghuman, S.P.S.; Singh, J.; Honparkhe, M.; Ahuja, C.S.; Dhami[3], G. Nazirand, D.S. and *Gandotr*, V.K.(2011). Differential Fertility in Dairy Buffalo: Role of Thyroid and Blood Plasma Biochemical Milieu. *Iranian Journal of Applied Animal Science;* 1(2): 105-109.

6. Chandrasekaran, S.; Kennett, L.; Yeap, P. C.; Muniandy, N.; Rani, B. and Mukkur, T. K. S. (1994). Characterisation of immune response and duration of protection in buffaloes immunized with haemorrhagic septicaemia vaccines. *Vet. Microbiol.*; 41**:**213-219.

7. Mancici and Coll. (1965).immunochemistry; 2:235.www.itaonline.it.

8. Field, A. (2009). Discovering Statistics Using SPSS (Introducing Statistical Method). (3rd Ed.), USA.

9. Petrie, A. & Watson, P. (2004). Statistics for veterinary and animal science. Illustrations prepared by Alexander Hunte. Printed and bound in Great Britain. By T.J. International Ltd, Padstowy Cornwall.

10. Serdaru1, M.; Nicolae1, I.; Enculescu1, M.; Bota, A. and Bolocan, E. (2011). Seasonal Variations of some Hematological and Biochemical Parameters of the Carpathian Romanian Buffaloes. I. The Winter Period. *Animal Science and Biotechnologies*; 44 (1) :94.

11. Jain, N. C. and Vegad, J. L. (1981). Haematological study on normal lactating Indian water buffaloes. *Res. Vet. Sci.; 2(4):*32-52.

12. Khattab, H.M.; El-Basiony, A.Z.; Hamdy, S.M. and Marwan, A.A.(2011). Immune Response and Productive Performance of Dairy Buffaloes and their Offspring Supplemented with Black Seed Oil. *Iranian Journal of Applied Animal Science;* 1(4): 227-234.

13. Miller, E.C. and Abel, W.(1984). Changes in the immunoglobulins IgG, IgA and IgM in pregnancy and the puerperium. *Zentralbl Gynakol.*; 106(15):1084-91.

14. Benster, B. and Wood, E. J. (1970). IMMUNOGLOBULIN LEVELS IN NORMAL PREGNANCY AND PREGNANCY COMPLICATED BY HYPERTENSION. *BJOG: An International Journal of Obstetrics & Gynaecology*; 77(6): 518–522.