



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

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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 IgG وبعض معايير الكيمياء السريرية لمصل الدم في جاموس الماء الممنوع بلقاح الانتان الدموي في مدينة القاسم

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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 على 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 الانتان النزفي HS. فحص البيليروبين، وخمائر الكبد (ALT و GGT)، والبوتاسيوم K، والكرياتينين واليوريا باستخدام جهاز الرفلاترون Reflatron. ولم تظهر النتائج أية فروقات بين مستويات البيليروبين في مجموعة الحوامل (0.670±0.057) والسيطرة (0.762±0.151)، بينما اظهرت النتائج وجود فروقات معنوية مهمة بانخفاض مستويات خميرة ال ALT وهي فروق ذات دلالة إحصائية بين مجموعة الحمل (10,42±0.481) ومجموعة السيطرة (24.92±0.507)، أما مستويات خميرة ال GGT فقد كشفت الدراسة عدم وجود فروقات ذات دلالة إحصائية بين مجموعة الحوامل (7.23±0.5) والسيطرة (7.57±0.92)، كما كشفت مستويات البوتاسيوم K فرقا قليلا بين مستوياته في مجموعة الحمل (5.58±0.96) مقارنة بمجموعة السيطرة (3.67±0.48)، في حين كانت مستويات الكرياتينين في مجموعة الحمل قد ارتفعت ارتفاعاً بسيطاً (5.66±0.83) مقارنة مع مجموعة السيطرة (0.64 ± 2.63)، بينما لم تتأثر تراكيز يوريا مصل الدم وبقيت ضمن المعدلات الطبيعية في كلا المجموعتين (50±0.72 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 (677.076±0.79 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 One 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 \pm 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 ($50\text{ mg/dl}\pm 0.72$ 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 ($677.076\pm 0.79\text{ mg/dl}$) that similar to concentration of control group ($699.088\pm 0.10\text{ mg/dl}$) (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).

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