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ABSTRACT

The study of blood constituents can provide valuable information about the general health of an animal and, therefore, can be used for evaluating the health status of the animal a guide for diagnosis or differential diagnosis of a disease condition. A number of tissue enzymes are a valuable tool as diagnostic agents. The objectives of this research were to measure serum biochemical parameters of camels before and after the race and to find out the effect of the race on these chemical blood functions in race camels. This study took place in the State of Qatar Alshahanya Region, which is the area for the international and local races; especially of racing camels in the time period of one month. Samples of blood (5 ml) from jugular vein from 264 race camels from different ages and sex, all of them from Arabia strain hybridized with the Sudanese camels. The samples were taken in early morning before feeding and the race and handled as a control. Five ml of blood was taken from the jugular vein after the race directly. The race distance was about 4-5 km. Sera was separated by centrifugation and analyzed by Biochemistry Analyzer (ALERA, U.S.A.). Concentration of total protein, creatinine and urea were estimated. Enzymes activity of alkaline phosphatase (ALP), alanine transaminase (ALT), aspartate transaminase (AST), creatine kinase (CK), glutamyl transpeptidase (GGP) and lactate dehydrogenase (LDH), in addition to minerals; copper (Cu), iron (Fe) and calcium (Ca) were determined. The mean age of the studied race camels was 3.3 ± 0.93 years. Total protein, creatinine and urea were 6.2 ± 0.42 , 1.4 ± 0.19 and 16.8 ± 2.94 respectively. Liver enzymes ALT, AST, ALP and LDH mean values were 33.9 ± 15.60 , 96.8 ± 58.02 , 188.9 ± 40.49 and 437.5 ± 103.52 iu/l respectively. Mean values of serum minerals; Iron, Calcium and Copper were 91.4 ± 12.93 , 10.4 ± 0.41 and 76.1 ± 8.97 . Among

the male sample of the camels under the study (n=120), the mean age of the studied male camels was 3.6 ± 0.94 years. Total protein, creatinine and urea were 6.1 ± 0.45 , 1.4 ± 0.19 and 16.8 ± 3.11 respectively. Liver enzymes ALT, AST, ALP and LDH mean values were 32.2 ± 10.65 , 92.8 ± 36.45 , 189.8 ± 43.62 and 430.6 ± 96.5 iu/l respectively. Mean values of serum minerals; Iron, Calcium and Copper were 90.2 ± 13.54 , 10.4 ± 0.41 and 75.0 ± 9.14 . The female sample of the camels under the study (n=144), the mean age of the studied female camels was 3.4 ± 0.93 years. Total protein, creatinine and urea were 6.2 ± 0.40 , 1.4 ± 0.19 and 16.8 ± 2.81 respectively. Liver enzymes ALT, AST, ALP and LDH mean values were 35.3 ± 18.68 , 100.0 ± 71.44 , 188.2 ± 37.44 and 443.3 ± 109.27 iu/l respectively. Mean values of serum minerals; Iron, Calcium and Copper were 90.2 ± 13.54 , 10.4 ± 0.41 and 75.0 ± 9.14 . Positive correlations indicated significant direct relationship between age and total protein and urea respectively. Negative correlations were reported between age and ALT, AST, ALP and LDH activities respectively indicating significant indirect i.e reverse relationship. No significant correlation was found between age of the camel and serum minerals Fe, Ca and Cu. The studied male camels showed negative correlations indicating significant indirect i.e reverse relationship between age and ALT, AST, ALP and LDH respectively. No significant correlation reported between age of the camel and total protein, creatinine, urea and serum minerals Fe, Ca and Cu. The studied female camels showed positive correlations as a significant direct relationship between age and total protein and urea respectively. Negative correlations indicating significant indirect i.e reverse relationship were reported between age and ALP and LDH respectively. No significant correlation reported between age of the she-camel and, creatinine, ALT, AST serum minerals Fe, Ca and Cu. With regard to the total samples, a significant differences in total protein, creatinine, urea, ALT, ALP, AST and LDH were reported in

relation to age of the camel (P value < 0.05), while iron, calcium and copper reported no significant differences with regard to age of the camel (P value > 0.05). Significant differences were found in the mean values of total protein, iron, creatinine, urea concentration, LDH activity and copper among the control group of camels before and after race, and when considering the sex of the camels; differences were reported in mean values of iron and copper. No significant differences observed with reference to status before and after race and sex of the camel in all blood parameters.

ARABIC ABSTRACT

ملخص الأطروحة

دراسة مكونات الدم يمكن أن توفر معلومات قيمة حول الصحة العامة للحيوان، وبالتالي يمكن استخدامها لتقييم الحالة الصحية للحيوان دليلاً لتشخيص حالة المرض. وهناك عدد من أنزيمات الأنسجة هي أداة قيمة كعوامل تشخيصية. هدف هذا البحث إلى قياس المعلمات البيوكيميائية في مصل الجمال قبل وبعد السباق ولمعرفة تأثير السباق على هذه الوظائف في إبل السباق. أجريت هذه الدراسة في دولة قطر منطقة الشحانية، وهي منطقة للسباقات الدولية والمحلية، وخاصة سباق الهجن في فترة زمنية امتدت شهراً واحداً. أخذت عينات من الدم (5 مل) من الوريد من 264 من إبل السباق من مختلف الأعمار والجنس، وجميعهم من السلالة المهجنة مع الجمال السودانية. أخذت العينات في الصباح الباكر قبل التغذية والسباق والتعامل معها كعنصر تحكم أو ضابط. وتم أخذ خمسة مل من الدم من الوريد الوداجي بعد السباق مباشرة. وكانت مسافة السباق حوالي 4-5 كم. تم فصل مصل الدم بواسطة الطرد المركزي وتحليلها من قبل محلل الكيمياء الحيوية (أليرا، الولايات المتحدة الأمريكية). تم تقدير تركيز البروتين الكلي والكرياتينين واليوريا. الانزيمات نشاط الفوسفاتيز القلوية (ALP)، ناقلة ألانين (ALT)، ناقلة اسبارتاتي (AST)، الكرياتين كيناز (CK)، غلوتاميل ناقلة البيبتيد (GGP) ونازعة اللاكتات (LDH)، بالإضافة إلى المعادن. تم تحديد النحاس (Cu) والحديد (Fe) والكالسيوم (Ca). بلغ متوسط عمر الإبل في الدراسة 0.93 ± 3.3 سنة. وكان تركيز البروتين الكلي والكرياتينين واليوريا 0.42 ± 6.2 ، 0.19 ± 1.4 و 2.94 ± 16.8 على التوالي. كانت إنزيمات الكبد ALT و AST و ALP و LDH هي 15.60 ± 33.9 و 58.02 ± 96.8 و 40.49 ± 188.9 و 103.52 ± 437.5 على الترتيب. القيم المتوسطة للمعادن في المصل كانت كالاتي الحديد والكالسيوم والنحاس 12.93 ± 91.4 ، 0.41 ± 10.4 و 8.97 ± 76.1 . عينة الذكور من الإبل تحت الدراسة (ن = 120)، كان متوسط عمر الإبل الذكور المدروسة 3.6 ± 0.94 سنة. وكان مجموع البروتين والكرياتينين واليوريا 0.45 ± 6.1 ، 0.19 ± 1.4 و 16.8 ± 32.2 على التوالي. انزيمات الكبد كانت ALT، AST، ALP و LDH والقيم المتوسطة 10.65 ± 92.8 ، 36.45 ± 92.8 ، 43.62 ± 189.8 و 96.5 ± 430.6 وحدة دولية / لتر على التوالي. القيم المتوسطة لمصل المعادن الحديد والكالسيوم والنحاس 13.54 ± 90.2 ، 0.41 ± 10.4 و

75.0 ± 9.14. عينة الإناث من الإبل تحت الدراسة (ن = 144)، متوسط عمر الإبل المدروسة كان 3.4 ± 0.93 سنة. وكان مجموع البروتين والكرياتينين واليوريا 6.2 ± 0.40، 1.4 ± 0.19 و 2.81 ± 16.8 على التوالي. كانت إنزيمات الكبد ALT، AST، ALP و LDH هي 35.3 ± 18.68 و 71.44 ± 100.0 و 37.44 ± 188.2 و 109.27 ± 443.3 إيو / ا على الترتيب. القيم المتوسطة لمعادن المصل الحديد والكالسيوم والنحاس 13.54 ± 90.2، 0.41 ± 10.4 و 9.14 ± 75.0. وأظهرت الارتباطات الإيجابية علاقة مباشرة كبيرة بين العمر والبروتين الكلي واليوريا على التوالي. وجدت إرتباطات سلبية بين العمر وأنشطة ALT، AST، ALP و LDH على التوالي تشير إلى علاقة عكسية غير مباشرة. لم يوجد ارتباط معنوي بين عمر الجمل ومعادن المصل في الكالسيوم والنحاس. أظهرت الإبل الذكور ارتباطات سلبية تشير إلى علاقة معنوية غير مباشرة معنوية بين العمر وإنزيمات الكبد ALT، AST، ALP و LDH على التوالي. لا توجد علاقة معنوية بين عمر الجمل والبروتين الكلي والكرياتينين واليوريا والحديد والكالسيوم والنحاس. أظهرت الإبل الإناث المدروسة ارتباطات إيجابية كعلاقة مباشرة كبيرة بين العمر والبروتين الكلي واليوريا على التوالي. كما وجدت ارتباطات سلبية تشير إلى علاقة غير مباشرة عكسية كبيرة بين العمر و إنزيمات الكبد ALP و LDH على التوالي. لا يوجد ارتباط معنوي بين عمر الجمل، والكرياتينين، وإنزيمات الكبد ALT، AST و معدن الحديد، الكالسيوم والنحاس. أما بالنسبة للعينات الكلية فقد سجلت فروق معنوية في البروتين الكلي والكرياتينين واليوريا و إنزيمات الكبد ALT، AST، ALP و LDH فيما يتعلق بعمر الجمل ($P < 0.05$)، في حين لا توجد فروق معنوية بين الحديد والكالسيوم والنحاس ($P > 0.05$). هناك فروق معنوية في متوسط قيم البروتين الكلي والحديد والكرياتينين وتركيز اليوريا ونشاط LDH والنحاس بين مجموعة السيطرة على الجمال قبل وبعد السباق وعند النظر في جنس الإبل. وجدت إختلافات معنوية في القيم المتوسطة للحديد والنحاس. لا توجد فروق ذات دلالة إحصائية ملحوظة مع الإشارة إلى الحالة قبل وبعد السباق للنوع والجنس من الجمال في جميع معلمات الدم.