SOME STUDIES ON CHICKEN INFESTED WITH TICKS ARGAS (*PERSICARGAS*) PERSICUS

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ABSTRACT

The influence of Ticks on chicken health, liver as well as kidney function were determined. A total number of 40 chicken were monitoring in this study, 10 control and 30 experimentally infested with Ticks. The results revealed a highly reduction of blood glucose and non significant decrease in total protein level as well as highly increase was observe in serum Alkáline phosphatose (ALK) Total Bilirubin, mean while asparate aminotransferase (AST) Alanine aminotransferase (ALT) urea, creatinine, sodium potassium level for 15 and 30 days of infestation. The ticks infestation induced a liver and kidney dysfunction in infested chicken. It was suggested that liver and kidney damage might have occurred in ticks infestation levels during 15 and 30 days were of considerable economic importance.

INTRODUCTION

Of all ectoparasites, Ixodoidea are highly specialized obligate parasites of a wide varieties of terrestrial and flying vertebrates. They cause great economic losses in livestock production which include the transmission of infection agents from animal to human (viruses, rickettsiae) and certain protozoans [Theileria, Babesia, and Borrelia] between animals **(Hoogstral, 1979)**. The direct damage to infested hosts as tick bite, blood loss and injection of toxins results in the reduction of protein productivity (eggs, meat).

Argas persicus parasitize on chicken in Egypt. It causes severe problems to chicken growth. It parasitize in large numbers causing anemia thus reducing egg and meat production. It also acts as a vector for transmitting Borrelia anserina. This latter causes high rate of chicken mortality.

Aim of the present work to study the effect of ticks infestation on clinicopathological changes in chicken.

MATERIAL AND METHODS

1) Ticks:

5400 unfed female ticks *Argas persicus* were collected from the husbandry farm of the Faculty of Agriculture, Cairo University. The unfed female ticks were identified according to (**Hoogstral *et al.*, 1981**). The collected unfed female ticks *Argas persicus* were kept in an incubator to 24 ± 1 °YUC and 75% RH, for further use.

2) Chicken:

40 chicken Avian, 21 days old and weighting an average of 1300 gm were obtained from EL-Wadi Company. These chickens were divided into thirty chickens were used in the experimental treatment while 10 chicken were used as a control. To study the effects of repeated feeding of *Argas persicus* adult tick on the clincopathological changes.

3) Sera samples:

Blood samples (3ml) were collected from the central wing vein of the naïve forty chickens before the starting of the experiment, after the last feeding, and then two times at 15 days and 30 days. Blood samples were allowed to clot at room temperature sera were separated centrifugation at 3000 rpm for 10 minutes, and then stored at 20 C for further use.

Serum samples were used for the determination of asparate aminotransferase (AST) and alanine aminotransferase (ALT) (**Reitman and Frankel, 1957**), Alkaline phosphatose (ALK phos) (**Belifield and Goldberg, 1971**), total Bilirubin (TBL) (**Malloy and Evelyn, 1987**), creatinine (**Follin and Nu, 1919**), Urea (**Patton and Crauch, 1977**), total protein (**Borham *et al.*, 1980**), serum sodium and potassium were determined by using atomic absorption according to (**Joseph and Roger, 1975**).

Statistical Analysis:

The obtained data were subjected to students T test according to (**Snedecor and Cochran, 1972**).

RESULTS

The non-feeding percent in *Argas persicus* females ascended gradually from the first feeding to the sixth, 20.4, 23.3, 23.8, 37.8, 37.1 respectively. (Table 1).

The mean values of serum biochemical data for infested and non-infested groups were shown in Table (2), there were a significant decrease in serum glucose level in d_{15} and d_{30} after infestation, with a regard to protein content a non-significant decrease in d_{15} and d_{30} of infestation were observed. While there was no significant change in zero day after infestation. Concerning liver function test there was a highly significant increase in AST and ALT. alkaline phosphatose and total Bilirubin during d_{15} and $d_{30}$of experiment but there was no change after serum urea, creatinine and sodium potassium, there was a highly significant increase in urea, creatinine sodium, potassium but no significant change after zero day of infestation.

DISCUSSION

In the present study, the non-feeding percent of *Argas persicus* was more significant in the 2nd, 3rd, 4th, 5th and 6th feeding respectively than in the 1st feeding. Similar results were observed by **Oyoun *et al.*, (1995)**. They reported that re-feeding had effects on the non-feeding percent of *Ornithodoros savignyii*. However, **Dusbabek *et al.*, (1991)**, found that the feeding of adult *Argas* (*A.*) *polonicus* tick on pigeons produces a host immunity which is protective against larval but not against adult feeding. This could be due to the long duration of the larval feeding on the host.

The chicken did not appear to respond clinicobiochemical to Ticks infestation, after zero day but after 15 and 30 days there was a highly significant decrease in blood glucose. The decrease in blood glucose began after 15 days from infestation and continued at the end of experimental period, the observed change in blood glucose might be attributed to stress induced by sucking ticks feeding continuously on blood and producing severe discomfort because of their numerous toxic secretions. Hypoglycemia might occur following severe exertion and in stages of starvation, (**Coles, 1986**).

The serum alkaline phosphatose (ALK) showed highly significant increase in infested chicken after d_{15} and d_{30} the results revealed an elevation and highly significant increase in total Bilirubin during d_{15} and d_{30} of experiment. The increase in total Bilirubin might be due to hepatic or extrahepatic obstruction, (**Coles, 1974 & 1986**).

In addition AST and ALT revealed an elevation and highly significant increase in infested chicken during d_{15} and d_{30} of experiment. In general the activity of (ALK, AST, ASLT) showed consistent elevations above their normal values thus probably indicate changes in liver cells, it is a fact, that (ALK phs) and AST enzymes are intracellularly bonded and that the increase in their circulating levels in serum might be indicative to cellular destruction, (**Varly *et al.*, 1980**) and (**Harwood, 1994**).

The present results revealed a highly increase in serum urea, ceartinine, Na^+ and K^+ levels in infested chicken d_{15} and d_{30} of experiment. Level of urea, creatinine in serum is known to reflect the state of glomerular filtration and kidney function, (**Kaneko, 1989**) and (**Harwood, 1994**), and increased values indicate kidney disease (**Coles, 1986**). Thus elevation of Urea, creatinine, Na^+, K^+ in serum of infested chicken probably pointed out to renal impairment as Urea, creatinine are eventually excreted by kidney's, therefore change of their level in serum would reflect the insufficiency of kidney tubules or kidney malfunctions (**Cornelius *et al.*, 1995**), the non-significant decrease of serum total protein indicated the serum protein up take by the tissue for protein synthesis. (**Coles, 1986**).

CONCLUSION

It could be concluded that in chicken infested with ticks reduced the efficiency of liver and kidney functions of chicken, which reduced productivity, it is necessary to control ticks to avoid consequent mortality in chicken farm.

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Table (1): Effect of repeated daily feeding on percent of unfed female ticks *Argas persicus*

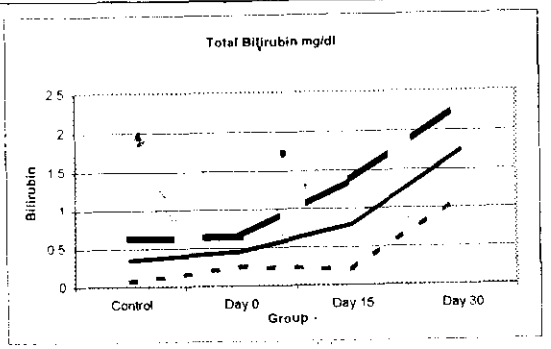
Feeding number	1st	2nd	3rd	4th	5th	6th
% of non-feeding female	20.4	23.3	23.8	37.8	31.7	35.9

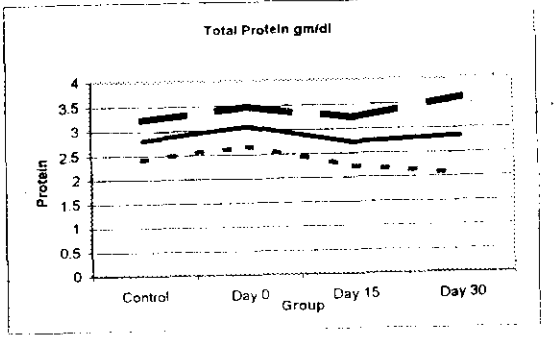
Table (2): Some Biochemical Changes in Chicken Infested with Ticks

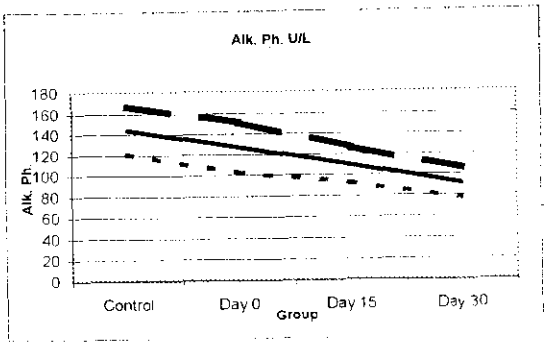
Parameters	Control	Day 0 of infestation	Day 15 of infestation	Day 30 of infestation
Total Biliruben Mg/dl	0.35± 0.14	0.45 ± 0.10	0.79* ± 0.29	1.74** ± 0.3
Total protein gm/dl	3.8 ± 0.2	3.07 ± 0.20	2.72* ± 0.25	2.84* ± 0.39
Alk. Ph. U/L	46 ± 4.5	48.2 ± 7.2	60.12* ± 8.06	76.8** ± 7.1
Urea Mg/dl	4.64 ± 0.5	4.2 ± 0.59	5.6* ± 0.45	5.86** ± 0.6
Creatinine Mg/dl	0.83 ± 0.08	0.89 ± 0.2	1.36* ± 0.30	1.69** ± 0.3
Na+ (Meq)/L	153.3 ± 10.4	163 ± 1.7	166.1 ± 9.01*	172.8 ± 8.3**
K+ (Meq)/L	58.4 ± 6.7	57.8 ± 4.8	79.7* ± 6.0	88.1** ± 7.6
Glucose Mg/dl	144 ± 11.5	126.7 ± 12.2	109.6* ± 8.5	90.9** ± 7.2
AST (Unit/I)	22.1 ± 4.5	19 ± 0.8	29.9* ± 5.6	36.9** ± 5.2
ALT (Unit/I)	11.15 ± 4.1	12.5 ± 1.1	17.4* ± 6.42	27.2** ± 4.5

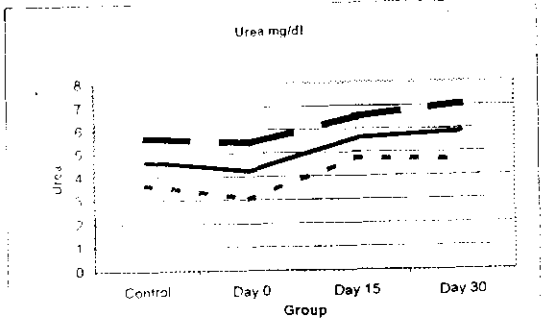
** **P < 0.01**

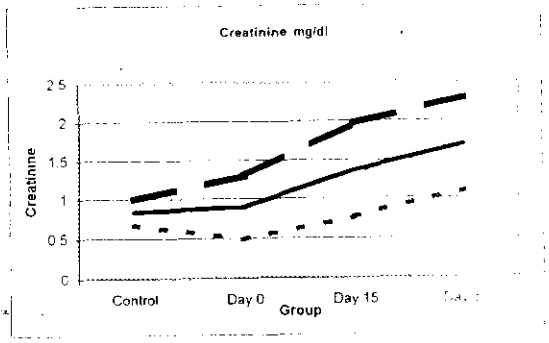
* **P < 0.05**

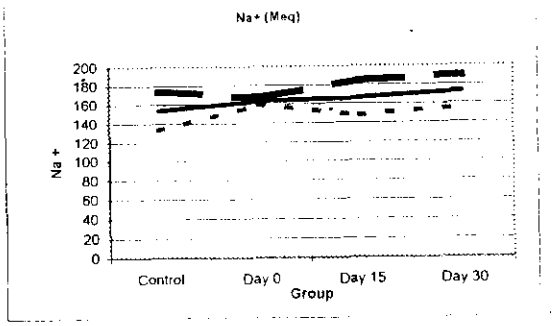


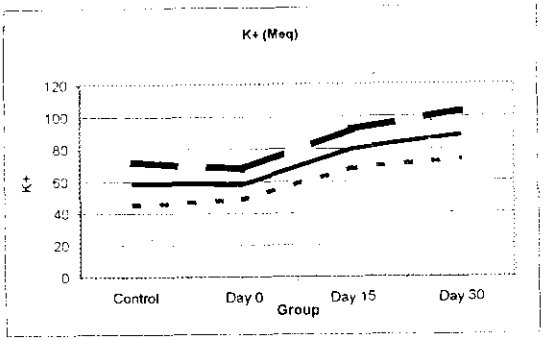


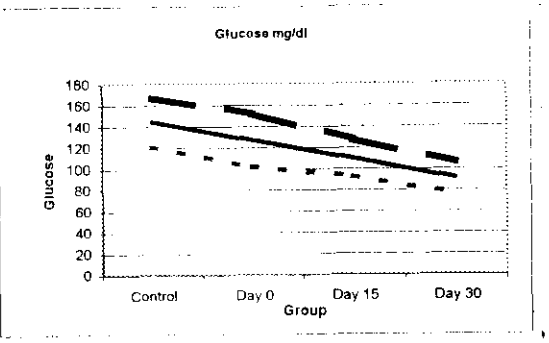


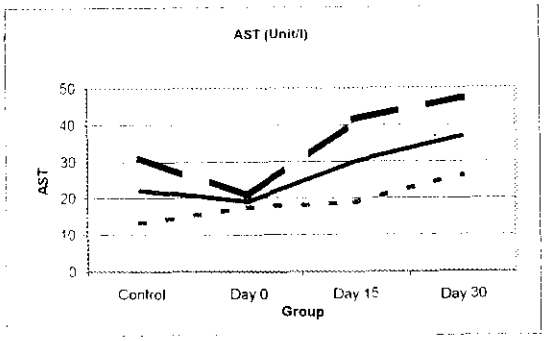


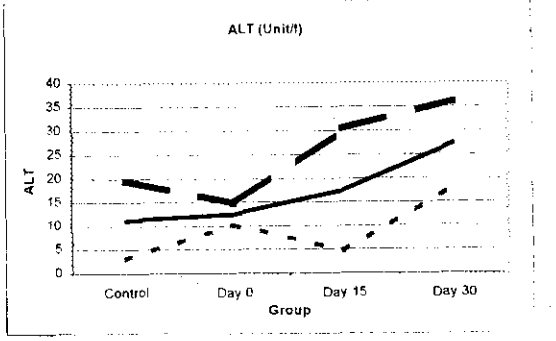












Legend : ····· Mean-2SD ——— Mean — — · Mean+2SD

الملخص العربي

بعض الدراسات التى تحدث فى الدواجن نتيجة عدوتهم بـ (Ticks)

سلوى محمود حبيب ـ منى سعد على زكى

قسم الطفيليات وأمراض الحيوان - المركز القومى للبحوث.

أجريت هذه الدراسة على ٤٠ دجاجة، ١٠ ضوابط، و ٣٠ تم عدوتهم بحوالى ٥٤٠٠ (*Ticks argasitabic persicus*)، وقد تم دراسة التغيرات الإكلينكية الباثولوجية التى تحدث لهذه الدواجن نتيجة عدوتهم بـ (Ticks). وأكدت الدراسة أنه يوجد إرتفاع ملحوظ فى مستوى إنزيمات الكبد (ALT & AST) وإرتفاع ملحوظ فى إنزيم (Alkaline phosphatose) و (T. Bilirubin) بينما يوجد إنخفاض فى مستوى البروتين الكلى ومستوى الجلوكوز فى (Serum)، كذلك يوجد تغيرات فى إنزيمات الكلى وهى (Urea & Creatinine) وارتفاع ملحوظ فى عنصر الصوديوم والبوتاسيوم فى (Serum).

وهذه الدراسة تؤكد أن (Ticks) يؤثر تأثيراً كلياً على وظائف الكلى والكبد فى الدواجن مما يجعل إنتاج الدواجن يقل نتيجة لحالات النفوق ويؤثر على كل الصحة العامة للدواجن.