

قسم طب الحيوان
كلية الطب البيطري - بني سويف - جامعة القاهرة
رئيس القسم : د/ محمد سمير *

تأثير بعض الأمراض على وظائف البنكرياس في الجاموس

محمد سمير ، سلوى رشاد ، ابراهيم النمر*

تم اجراء هذا البحث على ٤٢ من الجاموس المصري • وقد قسمت الحيوانات المستخدمة الى أربع مجموعات كالتالي :

- المجموعة الأولى ١٢ حيوانا وكانت مصابة بالالتهاب الرئوي •
- المجموعة الثانية ٩ حيوانات وكانت مصابة بالدودة الكبدية •
- المجموعة الثالثة ١١ حيوانا وكانت تعاني من انتفاخ بالكرش •
- المجموعة الرابعة ١٠ حيوانات سليمة اكلينيكيًا وتركت كضوابط •

وقد أثبتت النتائج الآتي :

- زادت مستويات أنزيمات الأميليزو والليبيز في مصل الدم زيادة معنوية في الحيوانات المصابة بالالتهاب الرئوي والنفخ ، أما في الحيوانات المصابة بالديدان الكبدية فقد نقصت هذه الأنزيمات عن معدلها الطبيعي •
- بالنسبة لأنزيم التربسن فقد لوحظ نقص هذا الأنزيم في كل الحيوانات المريضة •
- لوحظ في الحيوانات المصابة بالالتهاب الرئوي والنفخ أن مستوى السكر في الدم لم يتغير عن المعدل الطبيعي ولكن في الحيوانات المصابة بالديدان الكبدية لوحظ نقص معنوي في مستوى السكر بالدم •

**EFFECT OF SOME DISEASES ON PANCREATIC FUNCTIONS
IN BUFFALOES**
(With One Table)

By
M.S. HASSAN, SALWA, M. RASHAD and I.Z. EL-NEMR*
(Received at 24/3/1987)

SUMMARY

The present study was carried out on 42 buffaloes at Beni-Suef. Animals were classified into 4 groups. Animals in the first group (12) were suffering from pneumonia, while those of the second group (9) were infested with *Fasciola hepatica*. The third group (II) suffered from tympany and animals in the fourth group (10) were clinically healthy and served as control.

The results revealed that, serum amylase and lipase were greatly increased in buffaloes suffering pneumonia and tympany, but decreased in fasciola infested animals. At the same time, faecal trypsin was decreased in all investigated diseased buffaloes.

No changes in serum glucose level were shown in animals suffering pneumonia and tympany, while a significant decrease was found in fasciola infested buffaloes.

INTRODUCTION

Serum Values of pancreatic amylase, lipase and trypsin and blood glucose are valuable aids to the clinician in the diagnosis of pancreatic diseases in dogs, however, dysfunction of organs other than the pancreas increases serum amylase and lipase (HARDLY and STEVENS, 1975). Elevation of Serum amylase and lipase activities in dogs were recorded in case of acute liver diseases, volvulus, enterotoxaemia and emphysema (VULINEC, 1972), and in sheep in case of pneumonia and tympany (AZIZA, 1982). BENJAMIN (1961) added that, stress has been reported to elevate serum amylase and lipase. On the other hand, decreased serum amylase was recorded in dogs and horses with chronic liver diseases (VULINEC, 1972) and in sheep infested with *fasciola hepatica* and gastroenteral parasite (AZIZA, 1982).

The current literature lack any informations about variations of pancreatic enzymes in buffaloes in different diseased conditions. This situation arouse the interest for the estimation of changes of pancreatic enzymes (amylase, lipase and trypsin) and serum glucose levels in clinically normal buffaloes as well as in buffaloes suffering from pneumonia, fascioliasis and tympany.

MATERIAL and METHODS

This study was carried out on 42 buffaloes of which 25 animals were presented to the Clinic in the Department of Vet. Med. Cairo University and also from the Veterinary Medical centers in Beni-Suef, the other 17 animals were collected from farms in Beni-Suef.

* : National Research Center, Dokki, Egypt.

M.S. HASSAN, *et al.*

Animals were classified into 4 groups according to clinical and faecal examination. The 1st group (12 animals) were suffered from pneumonia, the 2nd group (9 animals) were infested with *Fasciola hepatica*, while the 3rd group (11 animals) were suffered from tympany. The 4th group (10 buffaloes) were clinically healthy and used as a control.

Blood for obtaining clear sera and faecal samples were collected from all investigated buffaloes.

The blood serum was analysed for amylase enzyme (SMITH and ROE, 1957) lipase enzyme (TIETZ and FIERECK, 1966), and glucose (TRINDER, 1969).

Faecal samples were used for qualitative determination of faecal trypsin (JASPAR, 1954).

The data obtained were statistically analysed (SNEDECOR, 1956).

RESULTS

The results obtained as shown in table (1) revealed that serum amylase and lipase activity were greatly increased in buffaloes suffering from pneumonia and tympany, while they were decreased in animals infested with *Fasciola hepatica*.

Faecal trypsin was qualitatively decreased in buffaloes suffering from pneumonia, tympany and fascioliasis.

Blood serum glucose level revealed no changes in animals suffering pneumonia and tympany and remained within the normal physiological level while in animals infested with fasciola, it was significantly decreased.

DISCUSSION

Increased values of serum amylase and lipase are generally indicative of pancreatitis either in dogs (ETTINGER, 1975) or in cattle and buffaloes (HASSAN, 1980). However dysfunction of organs other than the pancreas increases serum amylase and lipase levels (WALLER and RALSTON, 1971; HARDLY and STEVENS, 1975).

Although amylase origin has not been definitely determined most, if not all, of amylase present in normal plasma is probably of liver origin (COLES, 1980).

HIATT (1961) and NEUMAN *et al.* (1964) similarly reported that organs or tissues which produce amylase in dogs are liver, pancreas, small intestine, intestinal mucosa and others.

Our results revealed that serum amylase and lipase were greatly increased in buffaloes suffering from pneumonia and tympany than the normal buffaloes. These results could be attributed to damage of liver, pancreas and gastrointestinal mucosa. This damage was probably due to anoxia and/or toxins which are the cause of secondary liver disorders such as infiltrative and degenerative lipidosis (BLOOD and HANDERSON, 1980 and COLES, 1980). The obtained results were in agreement with that reported in sheep and goat by AZIZA (1982). On the other hand, serum amylase and lipase levels were found to be lowered than normal values in buffaloes infested with *fasciola hepatica*. This result may be attributed to the cholangitis, biliary obstruction and destruction with fibrosis of hepatic tissue. Liberation of hemolytic toxins by the fluke in addition could be claimed in such condition (BLOOD and HANDERSON, 1980). Similar results were recorder by VULINEC (1972) in dogs and horse with chronic liver diseases and in sheep affected with *fasciola hepatica*, and parasitic gastroenteritis (AZIZA, 1982).

PANCREATIC FUNCTION

Serum glucose level as shown in Table (1) was decreased below normal level in animals infested with *fasciola hepatica*. This result may be due to the decrease in hepatic gluconeogenesis which resulted from hepatic disorders as a consequence of cirrhosis in case of liver fluke (BARDENS, 1960). The obtained results were in agreement with that reported in sheep by AZIZA (1982) following such conditions. On the other hand serum glucose levels were not changed in calves suffering from pneumonia and tympany and remained within the normal physiological level. These results indicate that, the endocrine part of pancreatic parenchyma was not affected and the hepatic gluconeogenesis also was not changed in the diseased animals. COLES (1980), on the contrary stated that, anoxia may result in hyperglycemia, since liver glycogen is relatively unstable in the presence of a deficient oxygen supply.

The activity of faecal pancreatic trypsin in the present investigation was found to be decreased than normal level in calves suffering from pneumonia, tympany and fascioliasis. GROSSMAN (1962) stated that, the faecal enzyme level of trypsin in dogs affected with chronic pancreatitis, being much below than those of normal dogs. FREUDIGER (1978) added that, the pancreatic enzymes (trypsin and chymotrypsin) were reduced also in dogs affected with chronic exocrine pancreatic insufficiency. Our results were in agreement with that reported in sheep affected with pneumonia, tympany and fascioliasis and goats suffering from indigestion by AZIZA (1982).

REFERENCES

- Aziza, M.E. (1982): Studies of pancreatic function in healthy and diseased sheep and goat. Thesis, M.V.Sc. Fac. Vet. Med. Zagazig University.
- Bardens, J.W. (1960): Glycogen storage disease in puppies. *Vet. Med. Small Anim. Clin.* 61: 1174-1183.
- Benjamin, M.M. (1961): *Outline of Veterinary Clinical Pathology*. 2nd Ed. Iowa State Univ. Press. Ames, Iowa, U.S.A.
- Blood, D.G. and Handerson, J.A. (1980): *Veterinary Medicine* 6th Ed. Bailliere Tindall.
- Coles, H.E. (1980): *Veterinary Clinical Pathology* 3rd Ed. W.B. Saunders Company, Philadelphia and London.
- Ettinger, S.J. (1975): *Text Book of Veterinary Internal Medicine*. 1st Ed. W.B. Saunders Company Philadelphia, London and Toronto.
- Freudiger, U. (1975): Studies on chronic exocrine pancreas insufficiency with particular reference to the German shepherd dog. *Efferm. für Schung Fürk Leinternähung*.
- Grossman, M.I. (1962): Faecal enzyme of dogs with pancreatic occlusion. *pro. Soc. Biol. Med.* 110: 41.
- Hardy, R. and Stevens, J. (1975): Exocrine pancreatic disease. Cited by Ettinger S.J. (1975).
- Hassan, M.S. (1980): Some studies on pancreatic function in cattle and buffaloes. Ph.D.V. Sc. Thesis Fac. Vet. Med. Assiut University.
- Hiatt, N. (1961): Investigation of the role of small intestine in the maintenance of the serum amylase level in the dogs. *Ann. Surg.* 154: 864-873.
- Jaspar, D.E. (1954): A simple diagnostic test for pancreatic enzyme deficiency in dogs. *Ivo. Am. Vet.* 35: 523-528.
- Neuman, G.J. Skupps and Farrar, J.I. (1964): Studies on canine liver amylase. *Biochemical Biophys. Acta.* 85: 296-303.
- Smith, B. and Roe, J. (1957): Colorimetric method for amylase determination. *J. Biol. Chem.* 227: 357-364.
- Snedecor, G.W. (1956): *Statistical methods*. 4th Ed. The Iowa state collage press. Ames. Iowa.
- Tietz, N.W. and Fiereck, E.A. (1966): A specific method for serum lipase determination. *Clin. Chem. Acta.*, 13: 352-359.

M.S. HASSAN, et al.

- Trinder, P. (1969): Enzymatic determination of glucose. *Ann. Clin. Biochem.*, 6: 24-32.
- Vulinec, M. (1972): Studies of pancreatic function in healthy and diseased dogs and horses by blood amylase and lipase determination. *Veterinarski Archivn.* 42 (9/10): 221-227.
- Waller, S.L. and Ralston, J.A. (1971): The hourly rate of urinary amylase excretion, serum amylase, and serum lipase. *Gut.* 12: 875-883.

Table (1)
Serum Amylase, Lipase, Glucose and Faecal Trypsin in Buffaloes Suffering pneumonia, fascioliasis and tympany

	No. of Animals	Amylase U/100 ml	Lipase ml/0.05 N NaOH	Glucose mg%	Faecal trypsin
Group I	12	132.11 ^{**} ±20.11	1.50 ±0.32	72.4 ±6.45	++ve
Group II	9	47.78 ±9.58	0.68 ±0.35	42.7 ^{**} ±2.06	++ve
Group III	11	149.40 ^{**} ±12.96	1.50 ±0.41	77.2 ±8.02	++ve
Group IV	10	86.78 ±11.35	1.00 ±0.35	69.8 ±7.72	++++ve

* Significant at (p < 0.05).
** Significant at (p < 0.005).