

SERUM ISOAMYLASE VALUES IN NORMAL DOGS AND DOGS WITH EXOCRINE PANCREATIC INSUFFICIENCY

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ABSTRACT

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Estimations were made of the serum isoamylase values of normal dogs and of dogs with confirmed exocrine pancreatic insufficiency. A statistically significant difference was demonstrated between the two groups in respect of the values of one of the isoamylase fractions measured. Further study has confirmed that canine salivary tissue lacks amylase activity and that the source of the isoamylase fractions was the pancreas.

This knowledge has potential value in the diagnosis of canine exocrine pancreatic insufficiency.

INTRODUCTION

Serum amylase consists of several molecular forms, the so-called isoamylases. These act on the same substrate and produce the same products but they are produced by several different tissues (Kaneko, 1980). Previous studies suggest that the main sources of isoamylase fractions are the pancreas and intestine (Hiatt, 1959; Kramer, 1980). No amylase activity was reported in canine salivary tissue by King (1914) or Kramer (1980) but recently it has been suggested that amylase is present in salivary tissue (Cappo, 1980).

The value of total serum amylase in dogs fluctuates from day to day (Hiatt, 1959) and is considerably higher in normal dogs than in man (Kramer, 1980). In man, the urine contains large amounts of amylase and this can therefore be of diagnostic value. However, in the dog the urine contains no amylase, even when the serum value is elevated (Hiatt, 1961; Alareon-Segovia et al., 1964). This is because, in the latter species, there is total resorption of amylase in the glomerular filtrate by the renal tubules (Brobst et al., 1970).

TABLE I

Serum isoamylase values in normal dogs and in dogs with exocrine pancreatic insufficiency

Normal dogs				Dogs with exocrine pancreatic insufficiency			
Breed	Age (yr)	Sex	Isoamylase ( $\mu\text{mol/l}$ ) Salivary    Pancreatic	Breed	Age (yr)	Sex	Isoamylase ( $\mu\text{mol/l}$ ) Salivary    Pancreatic
Collie	1.0	F	5.0    8.5	German Shepherd	1.75	FN	3.5    9.0
Collie	1.5	FN	6.4    14.0	German Shepherd	2.0	F	3.4    18.1
Collie	2.0	F	15.8    26.7	German Shepherd	2.0	F	3.3    24.7
Collie	2.0	F	15.4    24.6	German Shepherd	4.0	F	1.1    13.9
German Shepherd	3.0	F	5.1    17.3	German Shepherd	6.0	M	6.1    19.9
Greyhound	4.0	M	4.8    18.0	German Shepherd	8.0	M	6.2    24.8
Labrador	1.5	F	6.9    13.1	Labrador	2.5	M	1.2    14.3
Labrador	2.0	M	6.7    13.3	Spaniel	3.0	FN	2.8    20.7
Labrador	2.5	FN	7.3    12.3				
Labrador	3.0	M	16.0    32.0				
Labrador	6.5	M	12.5    12.5				
Retriever	3.0	F	5.8    18.2				
Spaniel	2.5	FN	8.9    14.1				
Mean			8.9    17.3	Mean			3.4    18.1
Standard deviation			4.3    6.7	Standard deviation			1.7    5.5
n = 13				n = 8			

N = neutered