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Diabetes Insipidus: A Case Report

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Diabetes Insipidus: A Case Report

by
Virginia A. Kern

Diabetes insipidus may be idiopathic or symptomatic. In the idiopathic type, no gross lesions can be demonstrated and the cause is unknown. The symptomatic group can be caused by any number of pathologic conditions among which are the following: fracture at the base of the skull, encephalitis, cerebral hemorrhage, brain tumors, pituitary tumors, abscesses, or granulomatous diseases. The most common cause of the symptomatic type in the dog is a pituitary tumor.

The lesion causes interruption of the secretion of antidiuretic hormone (ADH) and can be located in any of the following areas: supra-optico-hypophyseal tract, the hypothalamic nuclei, the hypophyseal stalk, and the neurohypophysis.

Regardless of the cause, the syndrome is manifested clinically by polydipsia and excretion of excessive amounts of a very pale urine of low specific gravity.

History and Clinical Signs

On September 21, 1970, a nine-year-old, 27 lb., male Boston Terrier was presented to Stange Memorial Clinic with a history of rapid onset of polyuria and polydipsia of a three month duration. Upon questioning the owner about the prior health of the animal, it was ascertained that the canine had never been sick before and, as a whole, had been in good health until now.

The physical examination revealed no abnormalities, except for a slight obesity. The dog was admitted and water intake and urinary output were monitored. The animal consumed 3½ liters of water and excreted approximately 3 liters of urine over a 12 hour period. The appetite was normal.

Diagnosis and Treatment

A differential diagnosis was considered and included diabetes mellitus, diabetes insipidus, and chronic compensated interstitial nephritis.

A blood sample for glucose, BUN, SGPT, and CBC was drawn on admission. A urine sample was also collected. The results of these were:

Glucose 103 mg% (Normal: Fasting—60 to 90 mg%)
BUN 24 mg% (Normal: 10 to 20 mg%)
SGPT 420 Sigma-Frankel Units (Normal: 20 to 40 units)

CBC
Hct 57
Hb 21.2
RBC 7.6 million
WBC 11,600

Diff
Segs 75
Bands 7
Juv 1
Lymphs 14
Eos 1
Mono 2

Urinalysis
Color pale
Character clear
pH 8
Specific gravity 1.005

*Miss Kern is a senior in the College of Veterinary Medicine, Iowa State University, Ames, Iowa.
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As indicated above, the BUN and glucose were slightly elevated, but this was probably due to the hemoconcentration present—especially since the urine was negative for glucose and of low specific gravity. In diabetes mellitus, one would expect the blood glucose to be around 250mg% or more and a positive urinary glucose. Also, the specific gravity of the urine would probably be 1.034 or more. In chronic compensated interstitial nephritis, one would expect: the BUN to be normal or slightly elevated, a fixed urinary specific gravity of 1.010, and the presence of casts in the sediment. After considering the above results, a tentative diagnosis of diabetes insipidus complicated by cystitis and a mild liver disorder was made. Chlorothamine, tetracycline, and methisochol were administered for the latter two conditions.

Subsequent urine samples were collected on the afternoon of the 21st, the morning and afternoon of the 22nd, and the morning of the 23rd. The specific gravity of these samples ranged from 1.002 to 1.005. A PSP (phenolsulfophthalein) excretion test was performed on the 22nd to determine the amount of renal tubule function and over 60% was excreted in 30 minutes (normal for older dogs is 35% or more).

On the 23rd a repeat CBC, Urinalysis, and SGPT were ordered. The results were:

<table>
<thead>
<tr>
<th>CBC</th>
<th>Urinalysis</th>
<th>SGPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hct 60</td>
<td>Protein 2+</td>
<td>Lymphs 6</td>
</tr>
<tr>
<td>Hb 21.2</td>
<td>Glucose neg.</td>
<td>Mono 5</td>
</tr>
<tr>
<td>RBC 8.5 million</td>
<td>Occult blood 4+</td>
<td>Sediment 5</td>
</tr>
<tr>
<td>WBC 10,500</td>
<td>Bile neg.</td>
<td>Ketones neg.</td>
</tr>
<tr>
<td>Diff Segs 88</td>
<td>Ketones neg.</td>
<td>Sediment no RBC or WBC seen</td>
</tr>
<tr>
<td>Bands 1</td>
<td>Ketones neg.</td>
<td>Ketones neg.</td>
</tr>
</tbody>
</table>

As can be seen, the cystitis and liver problem were improved. However, the hematocrit and red blood cell count were higher than on the 21st indicating that the water intake was not compensating for the urinary output.

On the afternoon of the 23rd, the bladder was emptied by catheterization and the animal was injected with 10 units of Posterior Pituitary Extract subcutaneously. Urine samples were collected after 1 hour and after 2 hours for a volume and a specific gravity check. Five hours post injection, another urinary sample was collected for a specific gravity check. The results were:

Pre-injection ............ 1.002
1 hr post-injection ......... 1.015; vol: 75cc.
2 hr post-injection ......... 1.017; vol: 70cc.
5 hr post-injection ......... 1.007

On the basis of this response, a definitive diagnosis of diabetes insipidus was made. The dog was placed on 1 mg./lb. of hydrodiuril every 6 hours until a reduced urinary volume was noted; then 1 mg./lb. was administered every 12 hours as a maintenance dose. Because the owner called for the dog on the afternoon of the 24th, response to the maintenance dose is unknown.

References