The Electrocardiogram in a Nutritional Deficiency State

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In November, 1961, a 21-year-old student was admitted to hospital because of severe epistaxis. There was cyanosis of the extremities, nose and ears, and there was increased pigmentation of the skin most evident over the bony prominences so that the appearance was that of Addison’s disease.

His height was 5’8½” and he weighed 84 pounds. His temperature was 97°F, pulse 35 beats per minute, and blood pressure was 70/50 mm.Hg. His hands were cold.

The electrocardiogram (Fig. 1) showed sinus bradycardia, depressed S-T segments, flattened T waves and large U waves.
ELECTROCARDIOGRAM IN A NUTRITIONAL DEFICIENCY STATE

The chest film was reported as showing no evidence of disease of the lungs, but the radiologist thought the heart was unusually small.

Biochemical studies revealed the following:
- Serum potassium: 2.8 mEq/L.
- Serum sodium: 142 mEq/L.
- Serum Chlorides: 85 mEq/L.
- Cholesterol: 273 mg.
- Protein-bound iodine: 4.1 μg.
- Twenty-four hour urinary excretion of hydroxysteroids: 9 mg.

Despite six weeks of observation and a high calorie diet, the patient's weight decreased to 76 pounds. He was unable to name the student nurse who regularly brought him the mid-day meal. A psychiatric consultation was requested and a diagnosis of anorexia nervosa was confirmed. Confronted with this diagnosis, self-induced vomiting was admitted.

Fifty mg. of chlorpromazine was administered four times daily and three grains of sodium amytol was given at bedtime. In five weeks his weight increased to 121 pounds. Moderately severe jaundice made it necessary to withdraw chlorpromazine, but further improvement was obtained without drugs. Twelve weeks after the diagnosis was established, his weight was 134 pounds and behavior was considered normal. The biochemical disturbances had been corrected and the electrocardiogram was normal. (Fig. 2).

DISCUSSION

The abnormal electrocardiogram described above is not characteristic of uncomplicated starvation.

A study including electrocardiograms following starvation has been reported previously. Tracings were recorded on 249 veterans who had been captured at Hong Kong in December, 1941 and released in August, 1945. The diet in the prisoner-of-war camp was reported to have consisted of about 1300 calories and the average weight loss was more than 30 per cent. One hundred and sixty-six of the men had normal electrocardiograms. Thirty-five showed increased voltage (SV$_2$ + RV$_8$ = 50mm.) Abnormal T waves were found in 43. Arrhythmias were present in 21 and of these, 11 had delayed conduction, one had atrial fibrillation and four had marked bradycardia. Those with the bradycardia had flattened T waves, but did not have S-T depression and prominent U waves were not seen.

In this instance it is considered that the bradycardia was the result of starvation and the large U waves and S-T segment depression were due to hypokalemia from self-induced vomiting.

CONCLUSIONS

Two features of anorexia nervosa contributed to the abnormalities of the elec-
trocardiogram described in this paper; starvation caused the bradycardia and self-induced vomiting produced potassium depletion and S-T depression and large U waves; it seems unlikely that both would be found in other diseases.

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CONCEPTS OF ACUTE INFLAMMATION

The authors review certain aspects of the "chemical anatomy" of connective tissue and they analyze some of the changes produced by acute inflammation in this tissue at the molecular level. The sequence of events which characterize the acute inflammatory process — vasodilatation, microcirculatory insufficiency, ischemia and necrosis — is discussed as a function of the "chemical mediators" and the macromolecules of the connective tissue.

In the initial stages of acute inflammation, the loss of acid mucopolysaccharides, of insoluble collagen and the increase of hemosamines at the site of the lesion are constant findings, regardless of the type which produced the inflammation.


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CEPHALOTHIN IN SERIOUS BACTERIAL INFECTION

Sixty-five patients received 77 treatment courses of cephalothin for serious infections such as pneumonia and bacteremia due to Staphylococcus aureus, other gram-positive cocci and various gram-negative bacilli. The clinical and bacteriologic responses were considered to be excellent. Failure rate in 46 cases of staphylococcal pneumonia and bacteremia was 17 per cent. Mortality related to infection was 27 per cent in the cases analyzed. Seven instances of clinically significant superinfection occurred. Twenty-four patients experienced side effects. These were not of a serious nature and were not dose related.


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CEREBROSPINAL FLUID PRESSURE IN EMPHYSEMA AND COR PULMONALE

The present study has been carried out on 25 patients with emphysema, 22 of whom had developed chronic cor pulmonale. The cerebrospinal fluid pressure was high in emphysematous patients as compared to normal subjects. The patients with chronic cor pulmonale have higher cerebrospinal fluid than those having uncomplicated emphysema. The elevated cerebrospinal fluid pressure is always associated with high arterial CO₂. Fundus examination which was carried out in 20 cases of chronic cor pulmonale showed papilledema in one and venous congestion in five cases. It is suggested that hypercapnia is the main factor responsible for the increased cerebrospinal fluid pressure which might produce papilledema in some of these patients.


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LUNG RESECTION IN CHILDREN: PULMONARY FUNCTION RESULTS

The ventilatory function of 91 children studied one to 12 years after pulmonary resection revealed a predominantly restrictive rather than an obstructive type of ventilatory abnormality. There were no significant differences in the various tests in regard to the extent of the resection. The so-called "compensatory overdistention" observed postoperatively did not affect mechanical ventilatory efficiency of the remaining lung. It is suggested that such changes may be due to hypertrophy or actual growth of the remaining lung tissue rather than emphysema as is often seen in adults. The study also indicates that children can withstand less conservative pulmonary resections without too much sacrifice of ventilatory function.