Premature Systoles in Hypopotassemia of Unusual Genesis

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A 42-YEAR-OLD WOMAN WITH RHEUMATIC heart disease and mitral stenosis,
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successfully weathered a mitral commissurotomy on September 12, 1958. Her improved cardiac status had been well main-tained since then, on digitalis leaf 1½ gr.,

FIGURE 1: August 1, 1961.
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every other day and oral thiazide diuretics once or twice weekly.

On August 1, 1961, the patient was seen complaining of palpitation, chest pain, weakness, easy fatigue and slight cough. On examination, the cardiac rhythm was found to be very irregular due to frequent premature contractions. The electrocardiogram taken then (Fig. 1) shows a heart rate of approximately 95. The PR interval measures 0.16 seconds and the QT interval is 0.64 seconds (normal 0.34 seconds for this rate). Frequent ventricular premature contractions from more than one focus are evident, associated with wide asymmetrical T waves so that the QT interval equals that of the normal complexes. In leads II, III and AVF, one would be tempted to consider the T wave diphasic, merging into a U wave. However, in leads V₁ to V₃, the T wave is seen prominently individual, with no U wave following it, and U waves are more commonly seen in V leads than in other leads. Another possibility is that the U wave is absorbed in the T wave, which would explain the appearance of T in the unipolar leads as well as coincide with the occurrence of ventricular premature contractions in the supernormal phase.

Figure 1: August 1, 1961, ten minutes after the intravenous administration of 500 mg. procaine amide.

Figure 2: August 3, 1961, two days after administration of potassium.

Figure 3: August 3, 1961, two days after administration of potassium.
period (when U occurs). The ST segments are depressed in leads 2, 3, AVF and V₅, V₆ and V₇ (lead V₆ was damaged in the mounting process and is omitted).

On careful questioning, it was learned that this patient had experienced an unusual amount of perspiration in the previous few weeks during an unusually long hot spell. She had taken her digitalis and diuretic medication regularly, but had eaten very little. Particularly, she had partaken sparingly of or omitted foods with significant potassium content. A blood serum potassium revealed 3.1 mEq. per 100 ml.

Because of the cardiac irregularity and discomfort therefrom, the patient was given 500 mg. of procaine amide intravenously and the electrocardiogram taken ten minutes later (Fig. 2) showed a slowing of the heart rate to 88. QT was still 0.64 seconds and a sinus arrhythmia appeared so that the P wave was sometimes seated on the late descending limb of the T wave. The ventricular premature beats disappeared.

The patient was given potassium salts orally, and was advised to ingest high potassium containing foods. Two days later another electrocardiogram was taken (Fig. 3). The heart rate is 58 per minute. The PR interval is 0.20 seconds and the QT is 0.40 seconds (normal 0.39 seconds). Low U waves are visible in the V leads. The blood serum potassium level was 4.5 mEq. at this time.

Comments

It is well known that hypokalemia may follow digitalis intoxication, the use of thiazide diuretics, starvation, diarrhea, etc. However, a nexus of etiologic factors was present here, so that a smaller quantity of each was sufficient to produce the net result. Small doses of digitalis and thiazides, low potassium intake and excess perspiration added to hypokalemia. The latter is less likely to occur in people who eat well. It is also known that when sweating becomes profuse, the nitrogen content of the sweat falls whereas the sodium chloride and potassium concentrations rise.

Despite the observations of Bellet and his co-workers that the elevation of the U wave is a more specific sign of hypopotassemia than is the prolonged QT interval, in this case, it appears that the abnormality was relegated to the QT prolongation and occurrence of ventricular premature contractions of the multifocal origin.

RECENT STUDIES ON DELAYED HYPERSENSITIVITY TO TUBERCULIN IN HUMANS

Recent studies by Bovornkitti and associates, Dhonburi, Thailand, have indicated the possibility of association between increased serum alpha-2 globulin and endogenous hypersensitivity reactions in tuberculous patients. The authors have suggested that the excess alpha-2 globulin could be the antibody of delayed hypersensitivity released from the sensitized lymphoid cells when challenged by a specific antigen. Passive transfer of delayed cutaneous hypersensitivity with serum from persons with active tuberculosis has been tried with encouraging results. Further attempts of such a transfer using serum labelled with radioactive iodine (¹³¹I) have, however, led to a different conclusion. The labelled serum behaved as a specific antigen with effective sensitization of the recipient's cells. Serum transfer of delayed hypersensitivity may, therefore, be termed "passive active immunization."

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MEDIASTINAL GASTROGENOUS CYSTS

Two cases of mediastinal gastrogenous cysts were presented by Dr. Yudhveer Sachdeva, Amritsar, India, because of their uncommon occurrence and unusually large size, involving the whole of the left hemithorax in one and the paravertebral region from the thoracic inlet to below the diaphragm in the other. In both the cases, diagnosis was suggested before operation. Cases reported in the literature were analyzed from the point of view of incidence site and associated anomalies, thus emphasizing the characteristic features and diagnostic criteria. The prevalent theories of origin were reviewed and a further attempt made to explain the almost universal association of vertebral anomalies on the basis of a common developmental defect.

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