ELECTROCARDIOGRAM OF THE MONTH

Possible Thiamine Deficiency

L. F., a 49 year old white man, was examined for acute midepigastric distress on June 25, 1958. Physical examination was negative, with no evidence of systemic disease. Fluoroscopy, too, was normal. He conceded to poor eating habits and excessive drinking during the last two weeks. The electrocardiogram taken on June 25th was considered definitely abnormal. There was a regular sinus rhythm; the P-R interval was at the lowermost limit of normal (0.12 second) in several leads. The T-wave was almost isoelectric in leads I and II. Lead III shows low voltage of the QRS complex. The chest leads show inversion of the T-wave in V5 and flattening in V6. These changes were felt to be non-specific and non-diagnostic. The combination of these findings, however, suggested the possibility (if not probability) of thiamine deficiency. He was given 200 mg. of thiamine chloride in combination with other B-complex components on June 26 and again on June 27.
A second electrocardiogram on June 28 showed remarkable reversion to near normal. A third record taken on July 7 may certainly be considered normal.

In view of the fact that the patient was deemed clinically not to be suffering from coronary artery disease, and that the electrocardiogram had returned to normal after treatment of an extracardiac condition, a two-step (Master) test was performed (carefully prepared and supervised, of course). It was unequivocally normal. Five months after his last treatment there was no detectable sign or symptom of coronary artery disease, and he was entirely symptom-free; the ECG was normal on November 6, 1958.

Non-specific or non-diagnostic findings in an electrocardiogram have often been overzealously interpreted as positive evidence of coronary artery disease. With increasing knowledge and greater experience it is now appreciated that a host of conditions unrelated to heart disease may cause patterns similar or identical to "coronary" patterns (e.g. position, electrolytic changes, hormone deficiency, etc.). This has lead many to the opposite extreme, so that they become evasive to a point where an otherwise valuable test may be rendered meaningless. As much as it behooves the physician to make an attempt to find a specific cause for such non-specific features (e.g. fever, anemia, hypertension), so an effort should be made to define the specific nature of a non-diagnostic abnormality in the electrocardiogram. This is often impossible, of course, but it may be rewarding to all concerned if in his report the interpreter would state that the observed changes, although non-diagnostic, may be seen in association with certain conditions. The latter may then be enumerated.

In our case we found low voltage, low T-waves, a short P-R interval and slight S-T displacement. Such a pattern suggested thiamine deficiency as described, among others, by Scherf.

This was not stated as more than a mere suggestion and could not be considered a definite diagnosis. We believe, nevertheless, that the clinical history and prompt response demonstrated that the electrocardiogram was an invaluable aid in this instance.

On the basis of the ECG alone one could not rule out the existence of a small or subendocardial infarct. The clinical data favor an extracardiac explanation for the T changes. Thiamine deficiency seems to be the most likely and logical cause. It must be conceded, however, that positive proof cannot be offered.

This case is presented first as a reminder of the existence of this condition. Secondly, it is offered to permit consideration of the terms "non-specific" and "non-diagnostic" in an electrocardiographic interpretation as a challenge which one should try to meet without complacency.

SIEGFRIED SALOMON, M.D., F.C.C.P.
Staten Island, New York