Transient Left Bundle Branch Block Following Exertion*

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WHEN BUNDLE BRANCH BLOCK APPEARS TEMPORARILY, we speak of it as transient bundle branch block. It may be divided into two types: temporary bundle branch block which persists for days or months and the transient type which persists only seconds or hours. Such findings may be functional in cases of tachycardia without underlying heart disease or they may occur in cases of organic heart disease. Such conditions as rheumatic fever, diphtheria, syphilis, thyrotoxicosis and carbon monoxide etc. may be the etiologic factors. As a rule, transient bundle branch block occurs in patients with recent or old myocardial infarction or coronary and hypertensive heart disease.

The present report concerns the occurrence of left bundle branch block on exertion in three patients with a history of classic angina pectoris. Bundle branch block could be induced by exertion and disappeared after rest or nitroglycerine.

CASES 1 AND 2: Lead V6 (A) before exercise showing normal sinus rhythm. (B) after the Master two-step exercise test showing LBBB. CASE 3. Lead V6 from an electrocardiogram of 50-year-old man. (A) after the Master exercise test showing left bundle branch block and (B) after treatment with nitroglycerine showing disappearance of LBBB.
Case Reports

Case 1. A 65-year-old white man was brought to the hospital because of angina pectoris of two years' duration. On physical examination, he was apprehensive and pale. Blood pressure was 170/70 mm Hg and the pulse rate 80 per minute and regular. There was no abnormality noted on routine examination of heart and lungs. The clinical impression was coronary artery disease. The resting ECG was normal. After the Master two-step test, the patient developed mild substernal pain. The test was immediately stopped. Shortly after the exercise, the ECG showed the usually observed pattern of left bundle branch block. After six minutes of bed rest, the ECG returned to normal sinus rhythm. At a second examination a few days later, the electrocardiogram was exactly the same as the resting ECG (Fig. 1).

Case 2. A 60-year-old white housewife was referred to the hospital because of substernal pain on exertion of three years' duration. Physical examination was within normal limits and ECG showed a normal tracing. Blood pressure was 165/65 mm Hg. The Master two-step test was performed and showed left bundle branch block. After four minutes of bed rest, the left bundle branch block disappeared.

Case 3. A 50-year-old white man was admitted to the hospital with a history of substernal pain on exertion of two years' duration. On admission, the blood pressure was 120/70 mm Hg. The physical examination was within normal limits. The ECG showed occasionally ventricular premature contraction. During the Master test, the patient developed very severe substernal pain radiating to both arms. The test was stopped immediately, postexercise ECG showed left bundle branch block. Nitroglycerine had to be given because of severe substernal pain following which the electrocardiogram showed normal sinus rhythm.

Discussion

The occurrence of the bundle branch block after exercise has been observed by many workers. Left bundle branch block or right bundle branch block may occur in the absence of apparent heart disease, but this is much more common with right bundle branch block. Lewis and Sanabria found no histologic lesions in the conduction system in such cases and thus believed that the transient defect was due to "fatigue" of conduction system.

Some authors believe that transient LBBB or RBBB precipitated by exercise is usually related to coronary insufficiency, but Master believes that transient BBB occurs after exercise in patients with organic heart disease, as well as in normal persons. RBBB has been observed during spontaneous attacks of angina pectoris and after exercise in patients with clinical coronary artery disease. In our patients, the change from normal sinus rhythm to bundle branch block was accompanied by substernal pain. In our two cases, the transient LBBB was developed during the Master exercise test and disappeared after six minutes of bed rest. But, in the third case, nitroglycerine had to be given to the patient because of severe substernal pain.

The cause of impaired conduction in a branch was considered by Cameau to be oxygen lack in conduction system. Cases of unstable BBB in which the presence of the block or normal conduction depended on whether the ventricular rate exceeded or fell below a critical value.

The appearance of such transient LBBB after exercise, in the absence of thyrotoxicosis, myocarditis or rheumatic heart disease, should be considered a manifestation of coronary heart disease in the presence of other clinical findings. Occurrence of transient LBBB after exercise in a patient with classic history of angina pectoris may confirm the diagnosis of coronary artery disease.