

JAMA

EDITORIALS

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A NEW METHOD FOR TERMINATING CARDIAC ARRHYTHMIAS: THE USE OF SYNCHRONIZED CAPACITOR DISCHARGE

Drugs have long been the mainstay in the treatment of ectopic arrhythmias. The modern pharmacologic era was ushered in by the work of Wenckebach and Fry about 40 years ago. Many agents are now in use for terminating rapid heart action including quinidine, procaineamide, digitalis glycosides, potassium and magnesium salts, and the antihistaminic and sedative drugs. This era may now be drawing to a close.

In this issue of THE JOURNAL, Lown and co-workers (p. 548) describe a new method which no longer depends on drugs. By delivering a brief electrical discharge of 3,000 to 7,000 volts across the intact chest, they have been able to terminate a number of arrhythmias, including chronic atrial fibrillation and drug refractory ventricular tachycardia. The electrical impulse depolarizes the entire heart, extinguishes the ectopic complex, and permits the sinus node to resume as pacemaker.

Electrical countershock in the form of alternating current (AC) has been used for a considerable time in the treatment of ventricular fibrillation—a desperate measure employed in a desperate situation. It is well established that 60-cycle current may electrocute. Indeed, when AC is administered trans-thoracically to animals in normal sinus rhythm, there is a 20 per cent incidence of ventricular fibrillation. By changing the form of countershock and by employing a brief monophasic capacitor discharge, the occurrence of ventricular fibrillation is significantly diminished.¹ The heart is susceptible to electrically induced ventricular fibrillation only during a brief interval coinciding with the apex of the T wave of the electrocardiogram; this is the vulnerable period. By programming or synchronizing the capacitor to discharge at a specific point in the cardiac cycle outside the vulnerable period, the danger of ventricular fibrillation has been avoided altogether. The instrument for accomplishing this has been designated as the “cardioverter.”*

The treatment of ectopic tachycardias by programmed countershock has a number of advantages over the use of drugs. It is simpler in application and more certain and immediate in result. It does not require frequent electrocardiographic monitoring. Being applicable for both ventricular and supraventricular tachycardias, differentiation be-

tween these disorders ceases to be a critical factor for effective therapy. Such distinction, which is at times difficult, is essential when drugs are to be used. The instantaneous reversion after this form of countershock precludes development of depression in cardiac contractility or excitability, a common complication when large doses of antiarrhythmic agents are employed. Finally, these features of safety and simplicity permit the use of the cardioverter by clinicians less experienced in the recognition and treatment of arrhythmias.

A number of points remain to be clarified. Is anesthesia really necessary? Will synchronized countershock be successful in terminating all ectopic tachycardias? Can it be used safely in the presence of advanced heart failure or after acute myocardial infarction? Are there any contraindications to its use? The treatment of arrhythmias involves not only the stopping of the abnormal mechanism but also the preventing of its recurrence. Obviously this new method does not resolve this latter problem. Drugs will thus continue as effective measures for prophylaxis.

While early results appear highly promising, the authors express an appropriate note of caution: No method of treatment should gain unquestioned acceptance until the “late returns” are in.

1. Lown, B., et al.: Comparison of Alternating Current with Direct Current Electroshock Across Closed Chest, *Amer J Cardiol* 10:223-233 (Aug.) 1962.

OCCUPATIONAL HEALTH

About three-quarters of all American workers are employed in small industrial or commercial establishments. The vast majority of such workers are not served by any occupational health program or are served by programs of which comparatively few measure up to recommended standards. To help the physician understand the need and to assist his participation in small plant occupational health programs, the Council on Occupational Health of the American Medical Association has made available the “Guide to the Organization and Operation of Small Plant Occupational Health Programs.”¹

The importance of the physician's role in this sphere of medicine is verified by the statistic that more than 90% of physicians in the private practice of medicine do some occupational medical work. This is generally limited to the care of workmen's compensation cases and in the performance of physical examinations in the physician's own offices.

*Available from the American Optical Company, Buffalo, as the Lown Cardioverter.