

The Role of the Anesthesiologist in Academic Clinical Pharmacology Programs

CLINICAL PHARMACOLOGY is an extremely broad discipline which includes among its investigators chemists, who measure drugs and their metabolites in human biological fluids, and physicians, involved in the administration of new drugs to man.¹ Obviously, many anesthesiologists participate in activities which can clearly be identified as clinical pharmacology.

Approximately 35 academic clinical pharmacology units now exist in medical schools in the United States. Unfortunately, despite the traditional interest of anesthesiologists in pharmacologic research and the contributions they have made to the science of controlled drug trials, very few currently hold faculty positions in these units. It would be interesting to examine the reasons for this lack of participation.

The functions of academic clinical pharmacology units have been delineated in the past ten years; most units now engage in the following activities.²

Educational efforts include formal and informal sessions in which pharmacology and therapeutics are taught to medical students, house officers, and practicing physicians. Sessions are frequently held at the bedside, and the clinical pharmacologist is often requested to answer questions relating to drug interactions, adverse reactions to drugs, drug abuse, and a wide range of other problems concerning drug usage. Research usually involves both laboratory and clinical projects, with emphasis on two-way exchanges between pharmacology and clinical science. Service functions include participation in human rights and hospital formulary committees, liaison with the Food and Drug Administration and the pharmaceutical industry, and advising other faculty members in the design and performance of new drug evaluations. Training efforts include programs for development of full-time clinical pharmacologists, as well as specialists who wish to develop competence

in the evaluation of drugs used in their specialty.

The physician chosen to direct such a program must also coordinate interdepartmental teaching and research efforts and perform routine administrative duties concerned with recruiting and funding. In the United States, most directors and other full-time faculty members of clinical pharmacology units have been internists—not anesthesiologists. One reason for this may be that internists are occupied with the care of patients in hospital wards or in clinics where there are large numbers of students and house officers. They are, therefore, in an excellent position to teach the clinical aspects of pharmacology during the course of their usual activities. Another reason may be that departments of medicine are frequently divided into subspecialties and it is, therefore, not difficult to create divisions of clinical pharmacology to provide the necessary administrative substructure.

All of the above does not mean that anesthesiologists should not participate more fully in academic clinical pharmacology programs in the future. There are at least 65 medical schools in the United States without clinical pharmacology units, and anesthesiology can become a leading force in developing new units in these institutions. But the challenge must be met. Chairmen of anesthesiology departments can use their powers of persuasion to convince the deans of their schools and their pharmacological and clinical colleagues to provide funds and space for the development of clinical pharmacology programs. Young faculty members and residents should be encouraged to prepare themselves for careers in clinical pharmacology. In order to do this, they must be provided time to increase and broaden their knowledge of pharmacology and therapeutics. This can be efficiently accomplished in a clinical pharmacology program which offers opportunities for training in pharmacology and experience in

the wide range of activities discussed above.

Hopefully, in the future a few program directors will be anesthesiologists, but from the practical viewpoint, anesthesiologists undoubtedly will make their major contributions as specialty members of academic clinical pharmacology units. The structures of several large clinical pharmacology units have now been adapted to include clinical specialists as part-time faculty members. At Emory, for example, four departments are currently involved in the clinical pharmacology program: Medicine, Pharmacology, Pediatrics and Anesthesiology. An anesthesiologist with appropriate training would make a unique contribution in such an integrated research and educational program. For example, he would be the most appropriate person to teach the proper care of patients acutely depressed by drug overdosage. In addition, he could be the faculty member responsible for new drug research in the Anesthesiology Department, and for coordinating clinical pharmacology education in his department. Training for this role would be less extensive than that which is necessary to be a director of a clinical pharmacology unit, and would permit the anesthesiologist to continue to participate more actively in his specialty.

The extreme shortage of clinical pharmacologists in our academic institutions, the pharmaceutical industry, and the federal government was recently emphasized at a meeting on Clinical Pharmacology sponsored by the Drug Research Board of the National Academy of Science and the National Research Council. Anesthesiologists have a unique contribution to make in clinical pharmacology, and more should choose clinical pharmacology as a career. A list of training programs may be obtained by writing to Dr. Ellsworth Cook, Executive Secretary, The American Society For Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, Maryland 20014.

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Drugs

ANGIOTENSIN AND MYOCARDIAL FUNCTION Although angiotensin has been available as a vasopressor for several years, its clinical use has been limited, partly due to the controversial evidence regarding its clinical pharmacology, but more specifically because of its effect on myocardial function. The myocardial effect of angiotensin was studied in anesthetized dogs. Arterial, left ventricular, and coronary sinus catheters were introduced percutaneously without a thoracotomy and left ventricular performance was studied before and during an intravenous infusion of angiotensin. The findings were: myocardial contractility was reduced by 24 per cent, while heart rate, stroke volume, left ventricular coronary blood flow and left ventricular oxygen consumption did not change significantly; left ventricular end-diastolic and end-systolic volumes increased; stroke work did not increase uniformly; the stroke work-to-fiber length ratio declined. The authors concluded that: 1) angiotensin has a negative inotropic effect on the intact myocardium; 2) the unchanged myocardial oxygen consumption is due to a balance between declining contractility and increasing wall tension; and 3) the therapeutic use of angiotensin may be dangerous when contractility is already compromised. (Frank, M. K., et al.: *The Effect of Angiotensin on Myocardial Function*, *Amer. J. Physiol.* 218: 1267-1272, 1970.)