Preface

The development of ^{123}I-labeled amphetamine derivatives and their diagnostic application in connection with Single Photon Emission Computerized Tomography (SPECT) has opened up a new dimension for brain imaging in clinical practice during the last 5 years. Although since the mid-seventies Positron Emission Tomography (PET) has proved to be eminently suited for the clarification of questions concerning brain perfusion and metabolism, PET has remained restricted to relatively few research centers because of the extensive instrumentation necessary. In contrast, the widespread availability of radiopharmaceuticals labeled with single photon emitters, in conjunction with SPECT-systems, provides the possibility of their diagnostic use on a broad scale.

The experimental basis for the application of the new Single-Photon emitting tracers which show a high blood brain barrier permeability, has been established only relatively recently. For this reason it has only been possible for a few selected research groups to gain experience with these radiopharmaceuticals. The purpose of the symposium of the Rhineland-Westphalian Society of Nuclear Medicine, which was held in October 1984 in Bonn, was to bring together these groups in order to discuss both the experimental and the clinical data as far as currently available. The organizers were fortunate to be able to welcome most of the leading experts of the groups for an exhaustive exchange of ideas. The papers from the symposium are summarized in this book. The first part covers reports on basic research (preparation of labeled amphetamine derivatives, pharmacokinetics, and metabolism). Data are included on diamines and other potentially useful ^{123}I- or ^{201}Tl-labeled compounds and ^{99m}Tc-propylenaminoxime (PAO) derivatives. Two talks on instrumentation problems complete this chapter. The second part deals with clinical results of brain imaging with amphetamines in cerebrovascular diseases, epilepsy, migraine, and brain tumors. Problems of quantification of SPECT scintigrams and their clinical significance are also discussed.

Although it has been possible to gain additional experience with the new agents since the meeting in Bonn, the proceedings presented in this volume should be of fundamental interest both to radiopharmaceutical chemists and to physicians dealing with the diagnosis of brain lesions. If these proceedings can contribute to the wider use of SPECT for improved diagnostic results, than it will have fulfilled its purpose.

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