《**Invited Special Lecture**》

MIBG Imaging

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MIBG imaging is largely confined to research studies, both animal and human. There are an increasing number of reports, particularly in congestive heart failure patients, that show the feasibility and clinical utility of MIBG to assess myocardial sympathetic innervation. To what extent these early findings can be translated into routine clinical tests remains to be determined.

Other than PET imaging of sympathetic innervation, other modalities provide indirect measurements of sympathetic nerve function. Measures such as plasma norepinephrine, heart rate variability, and baroreflex testing, are all used to some extent. None of these provides direct measurement of cardiac sympathetic tone or nerve density. For assessment of sympathetic activation—an important prognostic index—in heart failure, norepinephrine spillover is probably a "gold standard". This method requires cannulation of the coronary sinus, however. MIBG imaging is probably more accurate and accessible than the indirect measures outlined above. The cost effectiveness issue remains unexplored. If unique, and clinically relevant data is forthcoming from MIBG imaging, cost effectiveness will likely be demonstrable.

The major impediment to more widespread use of MIBG imaging in the United States is the lack of commercial availability of I-123 MIBG. MIBG is commercially available in Europe and Japan, where applications are more widespread.

Most of the research work with MIBG has been done with conventional gamma cameras. In fact, most of the work in heart failure has been done using static imaging in the anterior projection for quantification (heart/mediastinal ratio). Clearly, more precise measurement of absolute MIBG uptake would be beneficial. To this end, attenuation and scatter correction should improve the utility of indices of MIBG uptake.

Development of Tc-99m analogues of MIBG might radically change the picture. Such agents, if feasible, may lead to widespread application, and new 'non'perfusion-function paradigms.

We need to perform multicenter trials to confirm the clinical usefulness of MIBG imaging. Protocols need to be designed to determine the proper location of MIBG studies in diagnostic algorithms for patient evaluation. The necessity for this type of information is particularly true in patients with congestive heart failure. Congestive Heart Failure alone accounts for the greatest burden on the Medicare budget in the United States. There are a large number of patients that may benefit from this: **nerve scan**. We must evaluate whether MIBG imaging will be more useful for patient triage (i.e. transplant vs. medical therapy) than currently available methods. We must determine if MIBG imaging can further refine the risk of sudden cardiac death in patients status post myocardial infarction. We must decide if MIBG imaging can play a role in the early detection of autonomic neuropathy in patients with diabetes mellitus.

We must help channel the resources necessary to establish this methodology as a useful clinical tool. Research results to date look highly promising.