IV. DRUGS AND DEVICES:

Bone scanning would be performed in all patients, using standard agents and techniques. 20 millicuries of 99^m Tc-MDP (methylene diphosphonate) is administered intravenously, and total body scanning to include hands and feet is performed 2 hours after injection. If the bone scan identifies an involved area, x-rays of the region identified by bone scan would be done.

The 99^m Tc-MDP is injected in a .5 cc aliquot; the scanning camera used for the 2 hour scan is either a Large Field of View (LFOV) or GE 400 T camera.

V. METHOD AND MATERIALS:

NAV1.954419.003

A. Objectives

The purpose of this study is to establish the prevalence of bone lesions in sarcoidosis by bone scans, confirmed by x-ray. Bony involvement will also be correlated with disease activity and extra-pulmonary involvement.

This protocol will be a short-term study if the initial bone scan is negative. If the bone scan is positive, then long term follow-up at 6 months will include a repeat bone scan to help define the natural history of bone involvement and to provide clinical follow-up.

B. Background

Skeletal involvement in sarcoidosis ranges from 3-15% in various series based on x-ray studies. The literature published to date emphasizes x-ray findings in patients with symptoms of bone or joint involvement. Recently, bone scans have been utilized in 17 patients in three different series, with preliminary findings of greater sensitivity of bone scans for establishing bone involvement compared

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to x-rays. Current literature has not established the prevalence of bone involvement detected by bone scan in a significant number of patients; also, the prognosis of patients with osseous involvement and the relationship of bony disease to pulmonary and extrapulmonary sarcoidosis has not been established.

Standard workup for sarcoid includes CBC, HBR, ECG, Pulmonary function testing, CXR, and gallium scan. If these studies are typical of sarcoidosis with CXR showing bilateral hilar and right paratracheal adenopathy (with or without parenchymal infiltrates), elevated ACE, and gallium scan shows hilar node and lacrimal-parotid uptake, then no tissue biopsy is necessary to diagnose sarcoidosis. If the clinical presentation is atypical or if the CXR/gallium scan/ACE combination is not typical of sarcoidosis, then standard workup would also include tissue biopsy of either lung (TBLB) or lymph node (peripheral or mediastinoscopy).

The bone scan that demonstrates increased uptake is nonspecific, and may indicate either sarcoid involvement, any of various arthritides or neoplastic disease; however, the characteristic location of bone scan abnormalities (centrifugal location, usually hands and feet, Ref. 3,4) with typical x-ray appearance (permeative, lytic, infiltrative, dactylitis or mixed-Ref. 1-4) will be related to sarcoidosis.

C. Methods

Study subjects will include 40 patients, ages 18-to-70, with a diagnosis of sarcoidosis. Patients seen in the pulmonary clinic will have history and physical examinations performed to establish the presence of bone and joint symptoms or signs. They will then have a standard bone scan performed using 99^m Tc, to be reviewed by the Chief of the Nuclear Medicine Department. X-rays of apparently involved areas on bone scan

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will be done, and films reviewed by a staff radiologist. A fasting liver panel with alkaline phosphatase isoenzymes will be performed to determine any correlation between radiographic/bone scan results. No preselection of patients based on race, sex, severity of disease or other variables will be attempted. Forty consecutive patients seen in the pulmonary clinic will be enrolled in the study, either newly diagnosed or seen for follow-up visits. Subsequent data analysis will compare prevalence of bone involvement with these variables.

Sarcoidosis is often a chronic disease, sometimes resolving within a year but occasionally persisting indefinitely. The format for this study will be to examine forty patients with sarcoidosis with scans -- this may be as the diagnosis is made, after the initial standard work-up, or as part of a routine follow-up visit. The patient will not be excluded because of prior or current treatment with steroids. Patients will not be screened on the basis of sex, race, chronicity of disease, treatment or symptoms. Rather, forty patients who are seen in the pulmonary division for an initial evaluation or follow-up visit will give informed consent and then have a bone scan performed. Subsequent data analysis will examine the impact of sex, race, steroid therapy, chronicity of disease, multiorgan involvement, severity of disease, abnormal blood chemistries, and symptoms (either pulmonary or skeletal) on the prevalence of bone scan abnormalities.

If bone scans are initially positive and lesions are confirmed by x-ray, or if patients develop symptoms of bony involvement, they will have repeat bone scans at six months to assess the natural history of bony involvement in sarcoidosis. These long term follow-up patients will have their bone scans correlated with other parameters of disease activity that are routinely followed at six-month intervals (CXR, ACE, gallium scan).

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