

Evaluation of a Possible Risk Association between Nephrogenic Sclerosing Dermopathy (NFD) and Gadolinium Enhanced MRI

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INTRODUCTION: Nephrogenic fibrosing dermatopathy (NFD) is a recently described cutaneous fibrosing disorder associated with renal dysfunction. It appears similar to scleromyxedema but with some notable exceptions, including the lack of involvement of the face and absence of plasma cells on histology, systemic involvement, and paraproteinemia. Patients can present with thickened or edematous skin with indurated papules and plaques involving the extremities and the trunk. The first reports of NFD appeared in 1997 and it has been hypothesized that, in conjunction with advanced renal failure and dialysis, a newly introduced agent(s) may be etiologically involved. Amongst the list of agents, gadolinium-chelates used for enhanced MRI (Gd-MRI) has been suspected. The aim of this study is to review our center data to determine a possible relationship between NFD, dialysis, and gadolinium.

METHODS:

Determination of NFD Patients- This study was HIPPA compliant and IRB approved. The Dermatopathology electronic database was reviewed over a period of 6 years from May 2001 to Sept. 2006, screening using the diagnostic key for NFD. Subsequently, the resultant list of patients was compared against the respective medical records to determine the date of diagnosis, and if and when Gd-MRI studies had been performed.

Determination of Dialysis Patients with Gd-MRI- Administrative office electronically filed statistics were used to determine the total number of MRI and Gd-MRI performed over the 5-year study period. A list of 1000 consecutively scanned patients over a 15 day period was used to then review patient records to determine the frequency of patients with creatinine levels above 1.5 units, or a record of dialysis. The relative frequency determined for these 1000 patients was assumed constant over the 5 year study period, and then used to estimate the total number of patients with elevation of creatinine or treatment by dialysis at the time of MRI. Gd-MRI was performed predominantly using gadodiamide (Omniscan, Amersham, General Electric, WI).

Table 1. Number of contrast MRIs and days to NFD diagnosis

Subj.	No. MRIs	NFD-MRI (Days)
1	6	482
2	1	104
3	2	32
4	5	140
5	1	68
6	10	104
7	2	135

RESULTS:

A total of 12 patients were diagnosed with NFD, and included histopathological specimen analysis. Of these patients 7 (58%) had prior Gd-MRI, and 5 (42%) did not have any documentation of MRI. A total of 93,450 MRI scans were performed over this period, of which an estimated 51,400 were Gd-MRI, with 5,100 patients with elevated creatinine and 408 on dialysis. The percentage of dialysis patients receiving Gd-MRI who also developed NFD was 1.7%. Patients with NFD had between 1 and 10 Gd-MRI prior to diagnosis with a range of 32-1648 days between the shortest and longest interval between scan and diagnosis. The average interval between the last Gd-MRI and diagnosis was 152 days.

CONCLUSIONS: Our center-specific results suggest only a weak associated potential risk association between Gd-MRI and NFD, with a long lead-time between gadolinium administration and diagnosis of NFD. Our collected data should serve for further analysis of other possible contributing factors etiologically involved with NFD.