Scintigraphy at different time intervals after administration of ^{123}I labelled Serum Amyloid P component (SAP) in patients with amyloidosis

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INTRODUCTION

AA amyloidosis is sometimes seen in longstanding arthritis. Early detection is important for prognosis. Scintigraphy with ^{123}I labelled serum amyloid P component (SAP) may be helpful to detect amyloidosis in patients suspected to have amyloidosis or patients at risk for it.

OBJECTIVE

Visual assessment of SAP scans in patients with amyloidosis at different time intervals after administration of the tracer in order to obtain the optimum time interval for scanning.

PATIENTS AND METHODS

Patients

61 patients with systemic amyloidosis (27 AA type, 27 AL type, and 7 ATTR type), 6 patients with localised amyloidosis, and 8 controls were studied. All patients and controls were treated in our university hospital.

Methods

200 MBq ^{123}I labelled human SAP was injected intravenously in patients and controls. Scans were made 0.5, 4, 24, and 48 hours after administration of the tracer and scored visually by two blinded investigators. Scans of controls were used to obtain guidelines for maximum normal uptake. The optimum time interval for making a scan was studied.

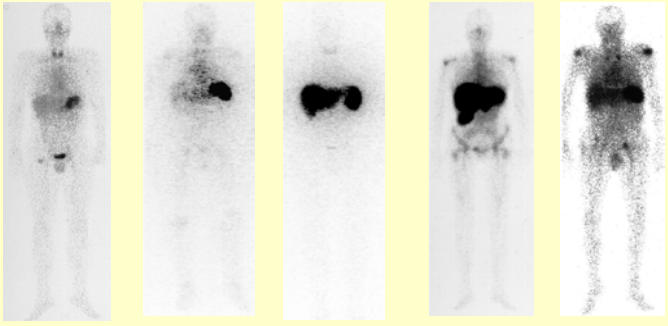
RESULTS

Guidelines were formulated and used in a step-wise visual assessment of scans of patients with amyloidosis. In short: first front images assessing heart, liver, and lungs and then back images for spleen, bone marrow, kidneys, and adrenals. See figure 1 for some examples.

Scans of 7 ATTR patients were most frequently positive (2 from 7) 24 hours after injection. Scans of 6 patients with localised amyloidosis were not informative. In 54 patients with AL and AA amyloidosis 42 scans (78%) were positive after 30 minutes, 46 scans (85%) after 4 hours, 48 scans (89%) after 24 hours, and 45 scans (83%) after 48 hours (see table below). In only two patients (one AA and one AL type) the scan was negative after 24 hours whereas the scan was positive 4 hours after injection.

Organ	AA (N=27)				AL (N=27)			
	0.5 h	4 h	24 h	48 h	0.5 h	4 h	24 h	48 h
Heart	0	0	0	0	0	0	0	0
Liver	2	2	2	2	13	13	14	14
Lung(s)	0	0	0	0	0	0	0	0
Spleen	22	24	24	23	17	20	22	19
Adrenal(s)	0	4	4	3	0	0	0	0
Bone marrow	0	0	0	0	5	4	6	2
Joints	0	2	3	1	1	2	4	3
Kidney(s)	6	9	14	11	3	5	6	3
Body total	22	24	24	23	20	22	24	22

Figure 1. Examples of specific organ uptake on SAP scans (front view) after 24 hours



Healthy control | Spleen | Liver Spleen | Liver Bone marrow | Liver Shoulders

RESULTS (continued)

In 7 AL patients a remarkable shift of uptake between liver and spleen was seen (figure 2): initially hepatic uptake was very intense, but after 4 to 24 hours splenic uptake increased gradually whereas hepatic uptake stabilised and seemed to decrease visually compared to splenic uptake. Hepatic uptake when present can be identified in almost all patients from 30 minutes after injection. On the contrary, kidney uptake can often not be identified until 24 hours after injection. The optimum moment of splenic uptake lies somewhere in between the uptake of liver and kidneys.

Figure 2. Differences in uptake of liver and spleen after 4, 24 and 48 hours. Back side.

CONCLUSIONS

- **The optimum time interval for the scan was 24 hours after injection of the tracer**
- **The scan was useful in identifying patients with AL and AA amyloidosis (in 89%)**
- **Intensity and time of uptake differed among organs. Liver uptake was seen first, followed by spleen, and later the kidneys**

http://www.amyloid.nl