

Jacobs A, Put E, Ingels M, Put T, Bossuyt A. One-Year Follow-up of Technetium-99m-HMPAO SPECT in Mild Head Injury. J Nucl Med 1996;37:1605-1609.

Design: Consecutive case series

Population/sample size/setting:

- 136 patients (85 men, 51 women, mean age 36) with closed head injury, admission GCS of 13 or more, no CT abnormalities, no intracranial surgical interventions, with or without retrograde amnesia exceeding 24 hours, treated at a university hospital in Brussels, Belgium
- Exclusion criteria were previous cranial trauma, epilepsy or other neurologic disorder, psych/drug/EtOH related diagnoses prior to trauma

Main outcome measures:

- All pts had SPECT and CT within 4 weeks of trauma; SPECT was done within 4 days of the CT scan for all patients
- SPECT images classified according to normal reference database and called SPECT+ if any abnormality was seen, SPECT- only if no abnormality was seen
- If SPECT was normal, no further SPECT was done unless clinical deterioration took place; if SPECT was abnormal, study was repeated at next evaluation
- Re-evaluations were done at 3 months, 6 months, and 12 months after initial evaluation and imaging
- Periodic clinical evaluation included symptoms of headache, anxiety, insomnia, irritability, fatigue, and other post-concussive symptoms; pts were classified as CLIN+ if even a single symptom was present, CLIN- if no symptoms were present
- No patient was included in any head rehabilitation program during study
- Initial SPECT was – in 63/136 and + in 73/136
- Among the 63 patients who were SPECT- at baseline, 58 were CLIN- at 3 mo, and all 63 were CLIN- at 12 mo
- Among the 73 patients who were SPECT+ at baseline, 28 were SPECT- at 3 mo, and all 28 of these were CLIN- at 12 mo
- Among 73 who were SPECT+ at baseline, 45 remained SPECT+ at 3 mo
 - o Among these 45 persistent SPECT+ patients, 16 were CLIN- while 29 were CLIN+
 - o Among the same 45 patients, 29 remained SPECT+ at 6 mo, and 14 of these 29 had become CLIN- at 6 months
- At 12 mo follow-up, only 12 were still SPECT+, 9 of whom were still CLIN+ and 3 of whom were CLIN-
- All who were SPECT- at 12 months were also CLIN- at 12 months

Authors' conclusions:

- SPECT has high negative predictive value; a normal SPECT predicts full resolution of symptoms at 12 months

- Positive SPECT scans may be obtained in the absence of clinical symptoms

Comments:

- The study appears to have been successful in retaining participants for 12 months of follow-up, which is helpful in assessing the prognosis for a negative SPECT imaging scan
- The prognostic significance of an initially positive SPECT remains unclear, but the conversion of a positive to a negative scan appears to have the same favorable prognosis as an initially negative scan

Assessment: Adequate for evidence that a negative SPECT predicts resolution of mTBI symptoms 12 months after closed head injury