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SUMMARY

Title: Brain perfusion single photon emission computed tomography findings in patients with posttraumatic anosmia and comparison with radiological imaging

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Abstract: Background: Different techniques in neuroimaging have been proposed for assessment of olfactory dysfunction but they are not without limitations. Recently, some studies showed the usefulness of single photon emission-computed tomography (SPECT) in evaluation of patients with posttraumatic anosmia. This study was designed to assess the possible diagnostic value of SPECT findings in patients with posttraumatic anosmia in comparison with magnetic resonance imaging (MRI)/CT imaging.

Methods: Sixteen patients who had head trauma and consequently anosmia, which was defined according to Cain's identification test, were included in this study. Two nonanosmic groups, traumatic patients and nontraumatic healthy individuals, were selected as control groups for this study. Qualitative and semiquantitative brain perfusion SPECT was performed by measuring the uptake ratio of the orbital frontal cortex to occipital pole in the sagittal projections (uptake index). All 16 target patients had a previous CT scan and/or MRI. Semiquantitative and qualitative brain perfusion SPECT were compared with radiological imaging.

Results: Semiquantitative assessment of brain perfusion SPECT revealed remarkable orbital frontal hypoperfusion as compared with two control groups. 87.5% of anosmic patients showed orbital frontal hypoperfusion (≥ 2 SD below the lowest level in healthy controls). In addition, the semiquantitative SPECT method detected more orbitofrontal abnormality than the qualitative method or radiological imaging (MRI and/or CT).

Conclusion: Findings suggest that by using SPECT, posttraumatic

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anosmia corresponds to the hypoperfusion in the orbital frontal cortex in a great number of patients. Because of its availability, rather low cost, technical ease, and possibility to obtain objective quantitative information, brain perfusion SPECT can be complementary to other diagnostic techniques in the evaluation of olfactory function, although additional neurophysiological and imaging studies are needed.

KeyWords Plus: CLOSED HEAD-INJURY; OLFACTORY EVOKED-POTENTIALS; POST-TRAUMATIC ANOSMIA; CEREBRAL-BLOOD-FLOW; SMELL DISORDERS; SPECT; CORTEX; CT

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