Brain perfusion single photon emission computed tomography with ^{99m}Tc-hexamethylpropyleneamineoxime in hereditary obsessive compulsive disorder

Sir,

We have observed an interesting finding on brain perfusion patterns in hereditary obsessive compulsive disorder (OCD). A family comprising of a mother and her two sons, who are under treatment in our neuropsychiatric clinic for their OCD symptoms, underwent ^{99m}Tc-hexamethylpropyleneamineoxime brain perfusion single photon emission computed tomography (SPECT) at our brain imaging center and interestingly the observed pattern of hypoperfusion in brain was very much similar in all three. Mother, a 60-year-old housewife had symptoms of OCD spectrum disorders, started at the age of early thirties. She had also added depressive features at the time of evaluation. Elder son, a 40-year-old male patient was suffering with severe OCD symptoms along with features of mixed neurosis. Younger one was 39-year-old male, a case of OCD trait with associated clinical features of anxiety neurosis. Both brothers had onset of OCD features since their childhood. Common SPECT findings observed in all three were hypoperfusion in prefrontal cortex, temporal lobes and occipital lobes [Figures 1-4]. The hypoperfusion is more lateralized to right side [Figure 4]. The elder offspring had also decreased activity in cingulate cortex and he had the most severe deficit in other common areas, whereas perfusion deficit is much less severe in younger one, who had also milder symptoms [Figure 1]. Severity of clinical symptoms was well-correlated with the severity of perfusion defects. Though the severity and extension varies, the perfusion pattern reflects the same type of regional dysfunction in the brain to support the familial nature of pathogenesis in this disorder.

Perfusion deficit in prefrontal cortex and temporal cortex is well-evident in case of OCD. In existing literature, there is an evidence of link between prefrontal defect and obsessive issues in OCD, cingulate activity with compulsive issues and temporal lobe deficit is related to irritation and other problems in OCD.[1,2] All three family members have the prefrontal and temporal lobe problem. Only the findings of Occipital lobe hypoperfusion in all three is a very new finding observed in this study. The mother had the history of vision loss in left eye few years back following an operation, though there are no such findings in her sons. The occipital lobe hypoperfusion may have link with the vision loss in mother and may affect her sons in future.

Hereditary role in OCD has been suspected for a long time.[3,4] Many twin studies found concordance in OCD symptoms, more in monozygotic twin pairs than in dizygotic twin pairs. Family studies also demonstrated the familial nature of OCD.[3] Study demonstrated, first degree relative had a fivefold higher risk of OCD prevalence and it usually tends to start at earlier age. The magnitude of familial association is stronger for obsession than compulsion.[4] These interesting images not only confirm the familial nature of OCD, it is also evident of the organic involvement in the disease. Similar pattern of brain perfusion

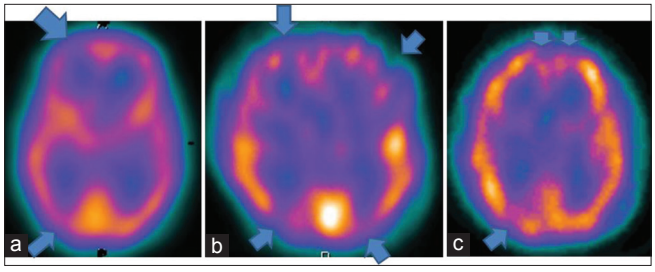

Figure 1: Transaxial view of ^{99m}Tc- hexamethylpropyleneamineoxime brain perfusion single photon emission computed tomography images of Mother (a), Elder son (b) and Younger son (c) showing Prefrontal and Occipital hypoperfusion. Image b shows bilateral and most severe involvement

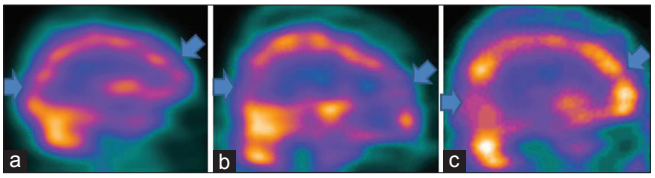

Figure 2: Sagittal view of ^{99m}Tc- hexamethylpropyleneamineoxime brain perfusion single photon emission computed tomography images of Mother (a), Elder son (b) and Younger son (c) showing Prefrontal and Occipital hypoperfusion on right side

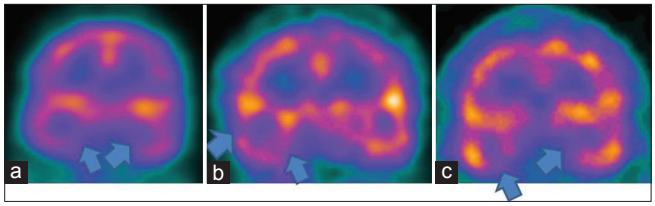

Figure 3: Coronal view of ^{99m}Tc- hexamethylpropyleneamineoxime brain perfusion single photon emission computed tomography images of Mother (a), Elder son (b) and Younger son (c) showing Temporal lobe hypoperfusion

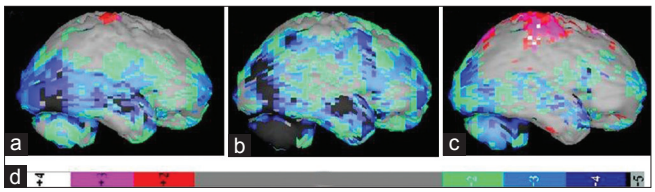

Figure 4: Right lateral view of Neurogam processed surface mapping image of Mother (a), Elder son (b) and Younger son (c). Color scale used in these images is shown in image (d)

in a mother with OCD and its offspring may find potential to predict future development of familial OCD in offspring.

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