Effectiveness Of Intranasal Insulin In Olfactory Dysfunction:A Case Series

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Background

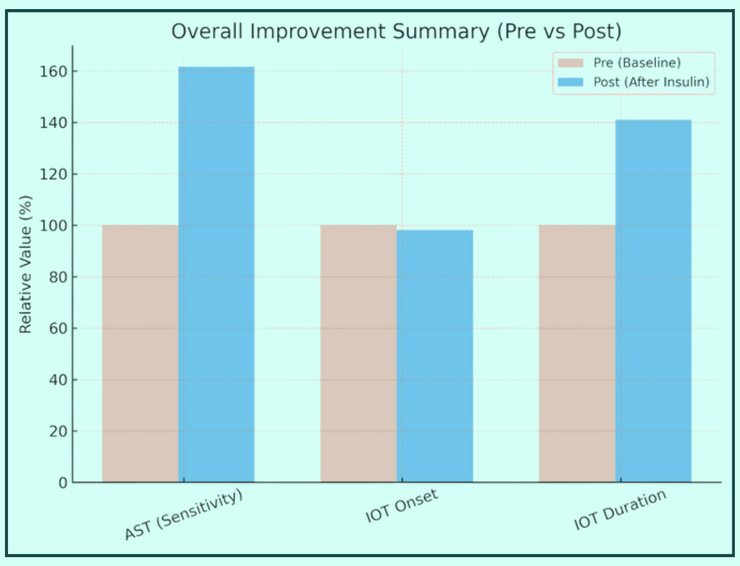
- Olfactory dysfunction (OD) includes hyposmia, anosmia, hyperosmia, parosmia, and olfactory hallucinations.
- It affects approximately 5-15% of the population and significantly reduces quality of life and is often associated with viral infections, head injuries, and neurodegenerative diseases.
- Intranasal insulin, known for neuroprotective and neurotrophic properties, bypasses the blood-brain barrier and directly targets the central nervous system, particularly the olfactory bulb.

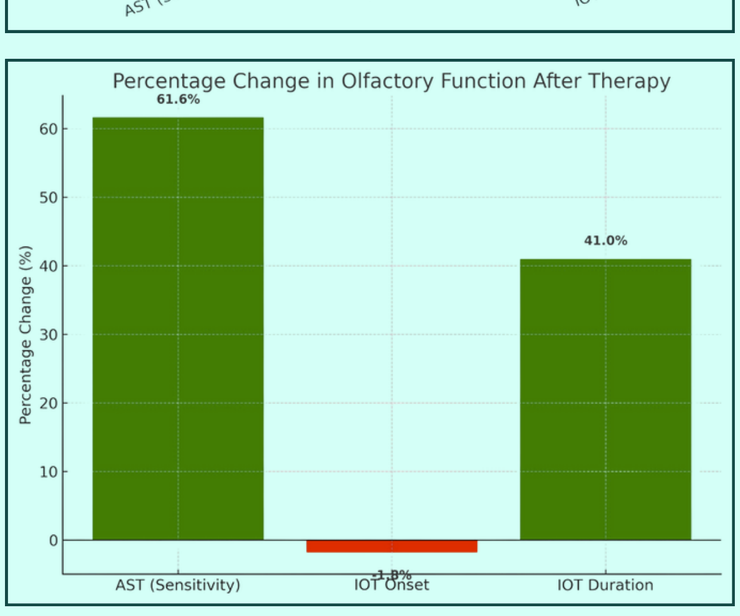
Materials and Methods

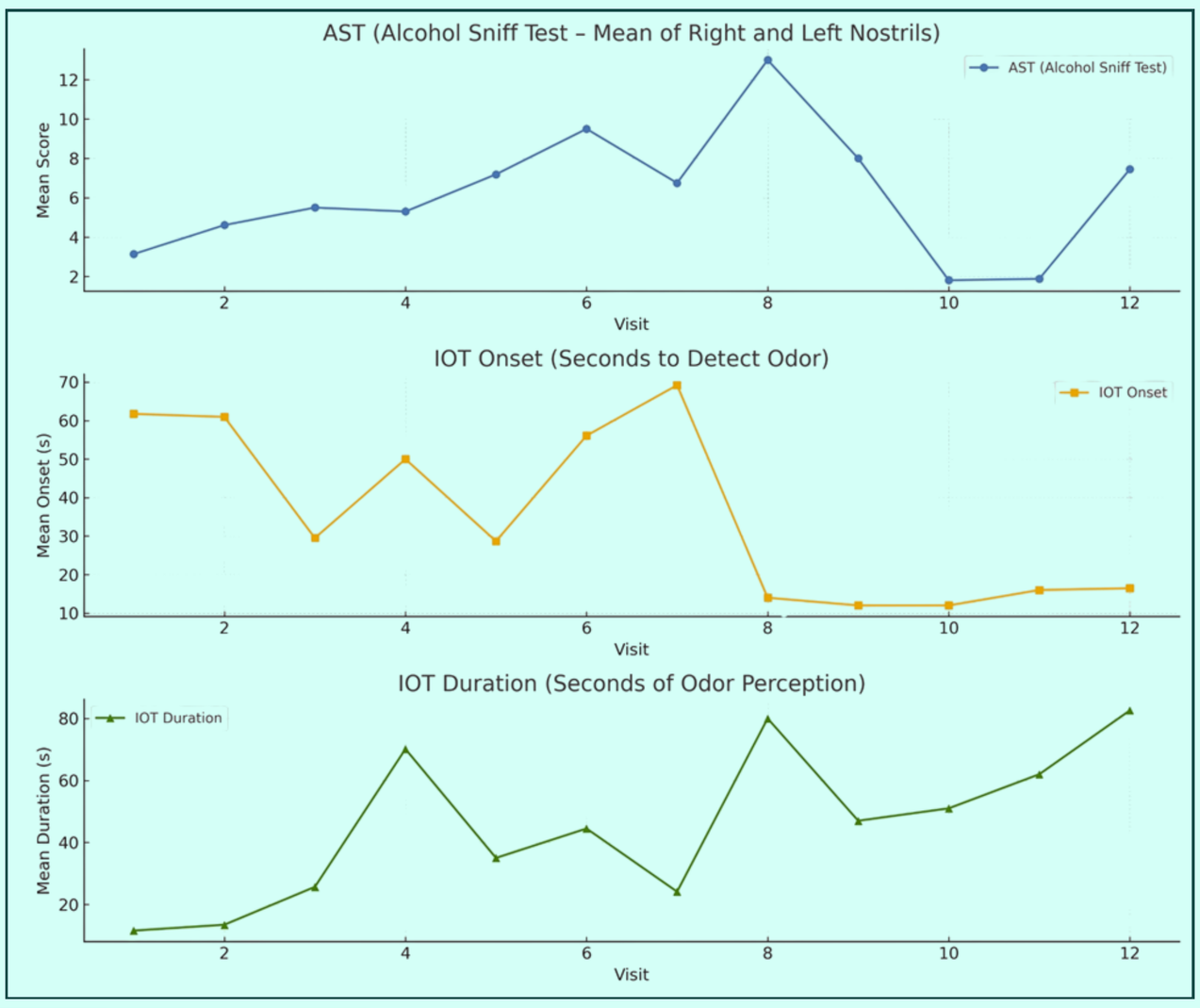
- This retrospective pre-post interventional study included patients with olfactory dysfunction lasting more than 3 months.
- Participants received 20 IU of intranasal insulin for 4 to 6 weeks. Olfactory function was assessed using the Alcohol Sniff Test (AST) and Intravenous Olfactory Test (IOT).
- Changes in test scores before and after treatment were analyzed to determine therapeutic efficacy.

Results

A total of 11 patients demonstrated TDI scores pre-treatment. A significant improvement was evaluated in three parameters. The AST showed a mean percentage increase of 61.65%, reflecting enhanced olfactory sensitivity. The IOT onset times a mean decrease of 1.8%, indicating faster odor detection. Meanwhile, IOT duration exhibited a substantial mean percentage increase of 41%, suggesting prolonged odor perception. These improvements indicate enhanced olfactory sensitivity, speedier recognition, and sustained perception over time. No adverse events were reported.







Conclusion

Intranasal insulin significantly improved olfactory function in patients with OD, enhancing sensitivity, detection speed, and perception duration. These findings support intranasal insulin as a potential treatment, though further controlled studies are needed for validation.

Nose to Brain Pathway of Intranasal Insulin

Intranasal insulin administration

Nose-to-Brain Delivery
- Olfactory nerve pathway
- Trigeminal nerve pathway (bypasses blood-brain barrier)

Insulin receptor activation in Olfactory bulb

Molecular & Cellular Effects
- Modulates Kv1.3 ion channels → ↑ olfactory sensitivity
- Enhances neural circuit formation in olfactory bulb
- Reduces olfactory sensory neuron apoptosis

Functional Outcomes
- Neuroprotection of olfactory neurons
- Support for regeneration of olfactory epithelium
- Improved olfactory perception