



Let's Revisit "The Mysterious Cranial Nerve: CN 0"

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As per standard anatomical classification there are 12 pairs of cranial nerves, designated by Roman numbers (I-XII). Their sequence is as per their passage from the cranial cavity i.e. antero-posteriorly and their names are concerned with the functions, areas of innervation or their course. Cranial nerve 0 is still under-recognized with rare description in standard medical text books, probably, as during anatomical dissection, this nerve is torn off while taking off dura mater and cannot be found. However, with pia mater intact, the nerve can be located near olfactory stalk and rostral part of optic chiasma [1,2].

In 1878 this nerve was described as the "supernumerary nerve" by Fritsch in elasmobranchs (cartilaginous fish) [3]. Later in 1905, it was defined in humans by the name of CN 0, as it presented rostral to the previously documented cranial nerves [1]. It's not a vestigial, but recognised as well-established anatomical structure [2]. In 1998, this nerve was officially added in the Terminología Anatómica [4].

Anatomically CN 0 is related to vomeronasal and first cranial nerve fibres. The ganglion cells of nerve are placed within the region of cribriform plate of ethmoid. The nerve fibres travel by olfactory trigone near the medial olfactory gyrus and lamina [5,6]. The axons of CN 0 support the migration of gonadotropin releasing hormone (GNRH) neurons to hypothalamus, so supposed to be concerned with the neurophysiology of human reproduction. Some relation between this nerve and kisspeptin system has also been predicted and need further research. Kisspeptin system is reported to contribute in different circuits within the limbic system which are concerned with olfaction and some negative emotions like anxiety, fear etc. [7-9].

This nerve has been entitled as the most "enigmatic" cranial nerve. Different names of CN 0 [1,6,10,11] and reason behind them are:

- **Nervus terminalis or Terminal nerve:** Suggesting its entrance to forebrain in relation to lamina terminalis [1]
- Supernumerary nerve means Extra, apart from standard twelve pair of cranial nerves
- **Cranial nerve 13:** Some consider it to be the 13th cranial nerve
- "Nerve N" or N nerve derived from Nerve nulla (means zero or nothing)
- Nerve of Pinkus - Initially labelled with this name in 1985, as Pinkus described this nerve in detail [12]
- Tractus olfacto-commissuralis as per its placement
- Some also named it as the New nerve, though not so new now.

Clinical implications

The developmental disturbances of nasal placode or GNRH neuronal circuits may result in hypogonadotropic hypogonadism, *Kallmann syndrome* which includes lack of sexual development and anosmia [13,14].

Future recommendations

- Further research on this nerve should be considered especially connection between CN 0 and the kisspeptin system, its exact role in pheromone detection and autonomic regulation.
- The nerve should be recognized using advanced imaging techniques for further research
- This nerve is justifiable to be added in text books and should be taught to medical students.

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