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PHYSIOLOGICAL AND ANATOMICAL ASPECT OF SENSORY ORGANS AS PER AYURVEDA AND MODERN PERSPECTIVE

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Abstract

In line with the teachings of Ayurveda ancient scriptures, *Indriyas*, or the sensory organs, serve as the means through which the *Atma* acquires knowledge. They function as the tools for the acquisition of knowledge. The *Gyanendriyas* housed within the body merge with the *Mana* which in turn unites with the *Atma*, thereby allowing the perception of knowledge. Ultimately, the *Buddhi* component of the respective *Indriya* facilitates the acquisition of knowledge. *Indriyas*, or sense organs, serve as the gateway for receiving sensory stimuli. Ayurveda categorizes *Indriyas* into two types; *Gyanendriyas* and *Karmendriyas* which are defined as sensory and motor faculties respectively in modern science. *Gyanendriyas* aid in the sensory process, while *Karmendriyas* facilitate the motor process. Among the five *Gyanendriyas*, *Shrotra* and *Chakshu* play pivotal roles in the learning process. *Jihva*, *Tvak* and *Grana* are others sense organs which performs functions of perception.

Key-Words: *Ayurveda, Senses, Gyanendriyas, Indriyas, Organs, Physiology*

Introduction

The *Indriyas* are classified as *Panchabautika*, since they are composed of the five basic elements. Each *Gyanendriya* is primarily influenced by one *Mahabhuta* and the specific *Indriya* solely receives the properties of that particular *Mahabhuta* in the form of stimuli. This principle elucidates the physiology of sense organs that each *Indriya* perceives distinct sensations due to their specific constitution. *Ghranendriya* is dominated by the *Prithvi Mahabhuta* and therefore perceives the knowledge of *Gandha* [1-3].

In Ayurveda, the *Indriyas* (sense organs) serve as the essential means through which the *Atma* acquires knowledge. According to *Acharya Charaka*, the *Indriyas* are fundamental instruments in distinguishing between living and non-living entities. The various types of *Indriyas* are as follows:

- ✓ **Gyanendriyas:** *Srotra, Sparshana, Chakshu, Rasana, Grana*
- ✓ **Karmendriyas** *Vaak, Upastha, Pani, Pada, Payu*
- ✓ **Ubhayendriya** *Mana*

These *Indriyas* are categorized based on the five fundamental elements. *Acharya Sankhya*, a prominent philosopher and sage, suggested that the formation of *Indriyas* is influenced by *Trividha Ahamkara*, which includes *Satvik, Rajasik* and *Tamasik Ahamkara*. Despite being composed of five elements, certain *Indriyas* are dominated by specific *Mahabhutas*. This dominance accounts for the precise reception of sensations by their respective *Indriyas* [4-6].

Guna and Mahabhuta attributes of Indriya:

- ❖ *Chakshu Indriya* is predominant to *Roop* and *Teja mahabhut*
- ❖ *Shrotra Indriya* possess predominance of *Shabda* and *Akasha*
- ❖ *Jihva Indriya* is *Rasa* and *Jala* predominant
- ❖ *Tvak Indriya* is predominant with *Sparsha* and *Vayu* element
- ❖ *Grana Indriya* possesses predominance of *Gandha* and *Pratvi* element.

Anatomical Aspect

The *Indriya* residing within the body, merge with the *Mana* in harmony with the *Atma*, facilitating the perception of knowledge. *Indriyas* are connected to their *Srotas* and *Indriya Buddi* located in the *Shira*. The *Pancha Indriya Buddhi* represents the association cortices of

the brain. The visual, auditory and somatosensory association areas are represented by *Chakshu*, *Shrotra* and *Sparshana Buddhi*, respectively. *Ghraana Buddhi* signifies the functions of the orbito-frontal regions of the brain. *Rasana Buddhi* represents the gustatory functions of the anterior temporal area of the brain. Furthermore, the common integrative area and prefrontal cortex, or frontal association area, distinctly denote the functionalities of the "*Buddhi*" as elucidated in Ayurvedic classics [6-8]. In Ayurveda, the human body comprises a total of eleven types of *Indriyas* as described earlier and their number is depicted in **Figure 1**.

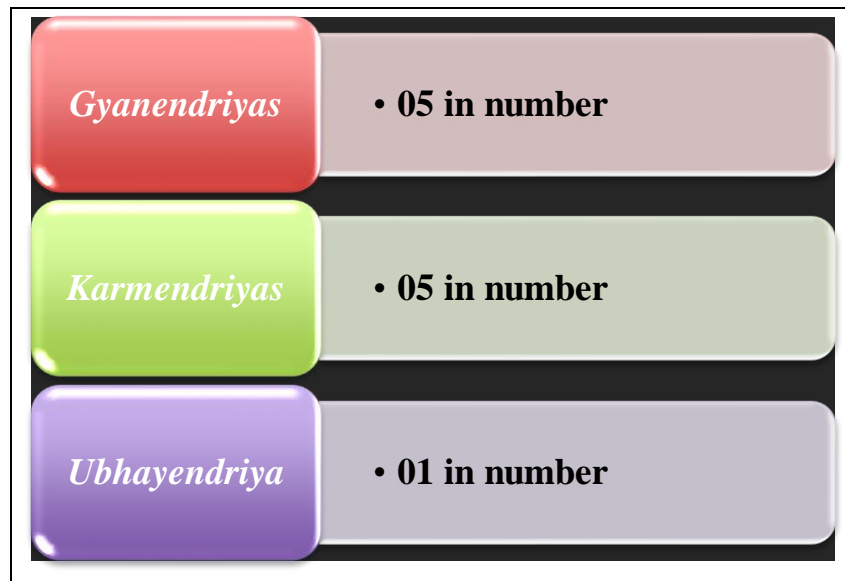


Figure 1: Types and number of *Indriyas*

Physiological Aspect:

Chakshu Indriya is linked with interpreting visual information, enabling the recognition of various objects based on their sizes, shapes and colors. The functional organ associated with this is the eye. The *Shrotra Indriya* is responsible for perceiving sounds, facilitating the process of hearing. The functional organ for this is the ear. The *Ghraana Indriya* is involved in sensing smells, and the nose serves as its functional organ. The *Rasana Indriya* is involved in perceiving tastes, and the tongue acts as its functional organ. The *Sparshana Indriya* deals with the perception of touch, with the skin being its functional organ.

Acharya Charaka has emphasized the intellectual aspect, relying on the five distinct *Gyanendriyas* present within the body. This framework, termed as *Indriya Panchapanchaka*, encompasses five key elements; *Indriya*, *Indriya Dravya*, *Indriya Adhithana*, *Indriya Artha* and *Indriya Buddhi*. In the process of perceiving a stimulus, the initial impetus for knowledge emerges within the *Atma*, subsequently transferred to the *Manas*. In conjunction with the *Indriya*, the *Manas* then perceive the respective *Indriyaartha*, or the object of perception. This initial perception primarily occurs at the mental level. Subsequently, the practical merits or demerits of the perceived object are determined.

The *Buddhi*, or intellect, discerns the specific properties of the object, prompting the individual to respond or communicate intelligently. Hence, *Atma*, *Manas*, *Indriya* and *Indriyaartha* represent the fundamental components essential for perception. In instances of "*Buddhi Vibhrama*" the individual's ability to make accurate judgments may be compromised.

The *Manas* regulates all the *Indriyas*, as it is responsible for controlling their functions. *Vata Dosha* also plays a role in regulating the functions of *Indriyas*. *Pranavata* regulates functions of the intellect, senses, mind and vision. *Udanavata* governs physiological functions such as memory and speech. *Vyanavata* is associated with taste sensations, managing both sensory and motor activities.

Similarly *Pitta* play an important role in the physiology of sense organs, *Sadhaka Pitta* facilitates the functions of the mind, helping in achieving desired functions. *Alochaka Pitta* is responsible for visual perception and *Brajaka Pitta* is linked to the skin, aiding in touch sensations. *Kapha Dosha* also helps to govern physiology of senses, *Tarpaka Kapha* nourishes the part of the *Indriya* located in the *Shira* and *Bodhaka Kapha* assists in taste perception [6-9].

***Indriya* and Health:**

Equilibrium in the functional state of *Indriyas* is crucial in determining health and disease according to Ayurvedic principles. Optimal balance of *Dosha*, *Dhatu*, *Mala*, *Atma*, *Indriya* and *Mana* is required for the desirable physiology of human body. Disorders related to *Indriya* can result from the unwholesome nature, duration, or point of contact of the *Indriya* with its respective *Indriyaartha*.

Modern Aspect

Sense organs serve as specialized tools that enable us to perceive the world around us, playing a vital role in our daily lives. They are the sole means through which we can interpret and comprehend our environment. These organs act as conduits for gathering crucial data through a network of nerves, responding to various physical phenomena. They fundamentally govern our connection and interaction with the surrounding world. The five fundamental sense organs are eyes, ears, nose, tongue and skin. Each of these sense organs contains receptors that transmit essential information through sensory neurons to specific locations within the nervous system. Receptors can be categorized into two main types: general receptors, spread throughout the body and special receptors, including chemoreceptors, photoreceptors and mechanoreceptors [10].

Conclusion:

Understanding the concept of *Indriya* is a fundamental step in comprehending *Kriya Sharir*, allowing Ayurvedic scholars to grasp the normal physiology of *Indriyas* and diagnose any related illnesses. *Indriya Vyadhis*, or disorders of the sensory organs, can be categorized as *Upaghata* and *Upatapa*, as some conditions might only involve anatomical abnormalities without affecting the functioning of the sensory organ. *Indriyas* serve as the cognitive faculties responsible for perceiving knowledge upon encountering the *Indriyaartha* as external stimuli. Safeguarding these sense organs is crucial for leading a healthy, joyous and enduring life. *Chakshu Indriya* is responsible for visual information; *Shrotra Indriya* is responsible for sounds perception and enables the process of hearing. The *Ghraana Indriya* helps to senses smells; *Rasana Indriya* is responsible for perceiving tastes sensation and *Sparshana Indriya* deals with the perception of touch. These *Indriya* play very important role in human body and serves as an organs of sensory functions.

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