

## A REVIEW: A CONCEPT OF AUTOPHAGY WITH SPECIAL REFERENCE TO PAACHANA THERAPY

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### ABSTRACT

Nowadays, our sedentary lifestyle is causing many metabolic diseases, and everyone is trying to understand the importance of *Langhana* (fasting) therapy today for its prevention. In another way, not only India but also western countries recognize the importance of fasting in different ways. Ayurveda has already been mentioned in a detailed description and its advantages comprehensively. Autophagy is a normal physiological process in the body that deals with the destruction of cells by maintaining homeostasis or normal functioning by protein or Fat degradation. Similarly, *Langhana* (10 subtypes of fasting) therapy includes the digestion of metabolic toxins, removes the blockage of the channels, thereby aids in minimizing the diseases. This article it's been focused on the concept of Autophagy and its correlation with *Pachana* therapy which is a subtype of *Langhana* therapy in Ayurveda.

**Keywords:** *Langhana*, *Pachana*, Autophagy.

### INTRODUCTION

A word Autophagy came first in 1960, Autophagy is the natural, regulated mechanism of the cell that removes unnecessary or dysfunctional components.<sup>1</sup> It allows the orderly degradation and recycling of cellular components.<sup>2,3</sup> In 2016 Professor Yoshinori Oshumi won Nobel Prize in Physiology or Medicine for the discovery of the mechanism for autophagy

under the title of “A fundamental process of degrading and recycling cellular components”.<sup>4</sup> Ayurveda knows the importance of *Langhana* therapy in which all the metabolic toxins get removed from the body with the removal of all blockage channels. *Langhans* therapies mean that is the whole procedure of producing lightness in the

body at various levels like *Dosha*, *Dhatu*, *Mala* or even at *Manas* i.e. at a psychological level. 10 types of *Langhana* are described by *Acharya Charaka* in *Sutrasthana*<sup>5</sup>, one among them is *Pachana* or it can be understood as *Shamana rupi langhana*. It is the treatment principle that is adopted for the digestion of *Ama Sansrightha* conditions at various entities i.e. *Koshtha*, *Dosha*, *Dhatu* etc.

#### **Aim and Objectives:**

1. To study the *Pachana* therapy (one amongst subtype of *Langhana*) and its correlation of Autophagy

#### **Materials and Methods:**

2. Ayurveda texts like *Bruhattryi* and the latest different articles on *Langhana* and Autophagy.

#### **Concept of Langhana:**

##### **Definition**

The procedure which can bring lightness to the body is called *Langhana* therapy.<sup>6</sup> *Langhana Karma* digests *Amadosha* and increase digestive power and establishes *Dosha saamyata*. *Langhana* has been described under a broad aspect, and ten treatment modalities have been grouped under this umbrella.

**Definition:** The procedure which does *Amapachana* but does not do *Agni Deepana* is called *Paachana*.<sup>7</sup> In *Samadosha* conditions, the administration of *Pachana Dravyas* body becomes light. *Pachana* has been indicated in the following *Madhyabala Rogas* like *Kapha-Pitta Samuthita Roga*, *Vami* (vomiting), *Aatisara* (diarrhoea), *Hrudroga* (heart disease), *Visuchika* (cholera), *Alasaka* (meteorism), *Jvara* (fever), *Vibandha* (constipation), *Gaurav* (heaviness), *Udgara* (belching), *Hrlaasa* (nausea), *Arochaka* (appetite loss).<sup>8</sup>

**Principle of Langhana:** We can understand *Langhana* with a simple example i.e. Intensity of fire is decreased by the more ash particles remaining on it, Same way in the human body, the digestive fire hampers when the production of *Ama* (metabolic poisons) is more, which is the main cause of all illnesses. In *Langhana* therapy *Agni* (Digestive power) starts digesting *Ama Dosha* and also clear all blockage of the channels of the body. In this way, it helps to fight against illness<sup>9</sup>. Similarly, in *Paachana karma* which is one amongst the type of *Dashavidha Langhana* also doing *Ama Paachana* (digestion of free radicals) in the body. So, the mode of action of

all *Langhana* types can also be understood with the help of Autophagy.

#### **Concept of Autophagy**

**Definition:** - Autophagy word derived from the Greek word “auto” means “self and “phage in” means to eat. Autophagy is a normal physiological process in the body that deals with the destruction of cells within the body. It maintains homeostasis or normal functioning by protein or Fat degradation. Autophagy mainly maintains a balance between the manufacture of cellular components and the breakdown of damaged or unnecessary organelles and other cellular constituents. Autophagy also removes and clears damaged cell organelles. It is the natural, regulated mechanism of the cell that disassembles unnecessary or dysfunctional components. In and all it allows the orderly degradation and recycling of cellular components.<sup>10</sup>

#### **Mechanism**

In mammalian cells, All the unwanted and defective cell components are covered by a membrane that is called phagophore, which closes around cytoplasmic material to form a spherical, double-membraned autophagosome Then the autophagosome outer membrane fuses with a lysosome to form an autolysosome, resulting in degradation of the inner autophagosome membrane and sequestered cargo. And this process increases when cells are starved or when cells are highly exposed to the accumulation of waste material.<sup>11</sup>

**Procedure:** There are three primary types of autophagy: microautophagy, macroautophagy and a mechanistically unrelated process, chaperone-mediated autophagy that only occurs in mammalian cells.

1. **Macroautophagy**– it is the main pathway, used primarily to eradicate damaged cell organelles or unused proteins.<sup>12</sup> First the phagophore engulfs the material that needs to be degraded, which forms a double membrane known as an autophagosome, around the organelle marked for destruction.<sup>13,14</sup> The autophagosome then travels through the cytoplasm of the cell to a lysosome, and the two organelles fuse. Within the lysosome, the contents of the autophagosome are degraded via acidic lysosomal hydrolase.

2) **Micro autophagy**- It involves the direct engulfment of cytoplasmic material into the lysosome.<sup>15</sup>

3) **Chaperone-mediated autophagy (CMA)**- It is a very complex and specific pathway, which involves the recognition by the hsc70-containing complex.<sup>16</sup> This means that a protein must contain the recognition site for this hsc70 complex which will allow it to bind to this chaperone, forming the CMA-substrate/chaperone complex.<sup>17</sup> This complex then moves to the lysosomal membrane-bound protein that will recognise and bind with the CMA receptor. CMA is significantly different from other types of autophagy because it translocates protein material in a one-by-one manner, and it is extremely selective about what material crosses the lysosomal barrier.

#### **Autophagy and Paachana modality**

*Langhans* therapy includes the digestion of metabolic toxins, removes the blockage of the channels, and thereby aids in minimizing the diseases. Similarly, Autophagy is to "self-eat", which, by definition, is the process by which the human body consumes its damaged cells and unused proteins. *Paachana* is one of the procedures for ten types of *langhana*. All the procedures included in *Dhashavidh Langhana* are known to cause autophagy. Where autophagy means eating own cells which could convert into harmful substances for the body. So autophagy protects from diseases like cancer, obesity diabetes and all metabolic disorder. *Paachana* procedure is defined by *Sharangdhara Acharya* as drugs that catabolized the undigested food, *Ama* but do not kindle the digestive fire are known as *Paachana*. *Paachana* procedure promotes the destruction of unwanted and harmful substances like *Ama*. *Paachana karma* is mainly seen in *Tikta Rasa Dravya* and *Tikta Rasa* is made up of *Akasha* and *Vayu Mahabhuta*. According to *Acharya Charaka* properties of *Tikta Rasa* is *Upashoshana*<sup>18</sup> i.e. drying and help in the depletion of moisture fat, muscles fat, bone marrow, lymph, pus, sweat, urine, stool, *Pitta* and *Kapha*. This *Rasa* also produces roughness in *Strotasa* i.e. circulatory channel. Whereas autophagy is also known as a way of cleaning out damaged cells of the body to regenerate newer. The substance that is light, cold, no unctuous, rough, non-slimy, subtle, and abounding, in the qualities of touch are dominated

by *Vayu*. They promote roughness, aversion, movement, non-sliminess, and lightness. Substances that are soft, light, subtle, and smooth and dominated by the qualities of sound are dominated by *Akasha*. They promote softness, porosity, and lightness. *Acharya Ksharpani* stated that the substance catabolized *Dosha*. Whereas *Arunadatta* stated that the drugs which give strength to *Agni* and promote digestion of food and *Doshas* are known as *Paachana*.<sup>19</sup> So as *Paachana* prevents many *Santarpanjanya Vyadhi*, metabolic disorders. consequently, *Paachana Dravya* which mainly of *Tikta Rasa* dominant and *Vayu* and *Akasha Mahabhuta* dominant are causes lightness, roughness in circulatory channels etc. also promote catabolism in the body and all those signs have been seen in person when autophagy is happening in their body. As *Paachana* is one of the procedures of *Langhana* and other procedures which also include in it i.e. *Upavasa* (fasting) and *Vyayama* (exercise) is already proven for causing autophagy<sup>20</sup>. Therefore, from the above concept of the mechanism of *Paachana Dravya*. It is to be said that *Paachana* could cause autophagy.

#### **CONCLUSION**

This mechanism of autophagy can be understood more likely be the same as what *Paachana Karma* performs in our body. Thus, Autophagy may be correlated with *Paachana Karma*. Broad term *Langhana* and Autophagy doing *Ama Paachana* of the body it helps to remove of toxins of the body, fight against infections. *Langhana* and Autophagy are clearing all channels of the body and recycles damaged organelles. This eliminates intracellular pathogens and thus helps the immune system.

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