A PILOT STUDY TO EVALUATE THE EFFECTS OF PRANAYAMA ON VITAL CAPACITY OF LUNGS

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ABSTRACT

As the new world is conquering new heights of technological advancements in various sectors of medicine, it is imperative that Ayurveda also provides its share of achievements that are visible. This article is an attempt in that direction. Ayurveda as a medical and health discipline involves the use of many ancient sciences as a tool to improve the health of human beings—one being Pranayama and Yoga. Yoga-darshana as visualized in the context of Ayurveda has been helping Ayurveda physicians in assisting in treating as well as preventing diseases of the body and mind. A pilot study was thus emphasized to evaluate the effects of pranayama on select individuals to study their lung capacities. Only healthy individuals were taken and the study was conducted for three days. Marked improvement was seen.

Keywords—Ayurveda, Pranayama, Yoga, Yoga-darshana, Pilot study, vital capacity, lungs

INTRODUCTION

The role of every medical discipline in the world is to alleviate the sufferings of individuals from the effects of diseases, ill-health or various other infirmities. Ayurveda emphasizes and practices the similar doctrine of alleviating the diseased from diseases and preventing the healthy from being affected by diseases. To apply the doctrine of keeping people healthy, Ayurveda uses the principles of Dina-Charya [Daily Regimen or Routine], Rutu-Charya [Seasonal Regimen or routine], Sadvrutta [Moral values],
Vyayama [Exercise], Yoga-niyama and many others.
As a sub-branch of Yoga, Pranayama entails the control of Prana-Vayu [the vital air responsible for normal respiration or in simple terms—breathing]. Thus as one controls breathing many positive effects can be seen in the body—both bodily as well as sub-consciously. The mind seems to get stronger in positive decision making, stress level decreases, digestion improves and a resolve to stay healthy begins in an individual. Thus relying on this principle a pilot study was conducted to evaluate the difference in lung capacity before and after Pranayama.

Pranayama means the control of Prana-Vayu. Prana-vayu is the most essential element of the human being which gives Prana or life to every living being. Without Prana-vayu there is no life, no vigour, no vitality but only stasis or death. Thus, every Yoga individual tries to control or restrain or regulate this Prana-vayu with a sense of gaining control over one’s subconsciousness. The same principle is used in Ayurveda to help individuals in controlling their body so that they remain healthy. In ancient texts like Charaka Samhita or Sushruta Samhita or Ashtang Hridaya Samhita, Pranayama has not been mentioned. But, Prana-vayu as the main type of Vayu or energy that controls life has been mentioned. It is one type of Vata Dosha. This Prana-Vayu resides in the head and it moves in the chest, throat. It controls Buddhi [motor functions], Hridaya [the heart], Indriya [Senses] and Chitta [Subconscious]. These are the mental functions, whereas the body functions include—Sthivana [Salivation or spitting], Kshavathu [sneeze], Udgaara [Belching], Niha-Shwaas [Inhalation] and Anna-Pravesha [swallowing of food or Degluttiton][Ref-Vagbhat 12]. Along with Prana-Vayu there are four other Vayus—Udana Vayu, Samana Vayu, Vyana Vayu and Apana Vayu. Out of these five Prana Vayu is more important because it controls both the respiration and heart. Thus it controls life. But Pranayama does not entail the control of only Prana Vayu. It seeks to control all the Vayus because all these Vayus complement each other. Regulating or controlling a single Vayu is not beneficial as all the Vayus together work as a common entity in
controlling all the functions of the human body.

The *Udana Vayu* resides in the chest and moves in the nose, umbilical region and neck. It controls the following motor functions: *Vacha* [voice], *Prayatna* [desire to work or perform any body function], *Urja* [energy or vigour], *Bala* [strength], *Varna* [colour of the skin] and *Smriti* [memory].

The *Samana Vayu* resides in the Duodenum and moves in the abdomen. It controls and regulates the *Anna-Grahana* [movement of food in duodenum], *Pachan* [its digestion], *Vivechayati* [absorption] and *Munchati* [assimilation].

The *Vyana Vayu* resides in the heart and moves in the whole body. It controls the *Gati* [speed of all fluids in the body], *Apakshepana* [the downward movement of body entities], *Utkshepana* [the upward movement of body entities], *Unmesha* [opening of eyelids], *Nimesha* [closing of eyelids] and all other body movements and activities.

The *Apana Vayu* resides in the colon and moves in the pelvis, urinary bladder, urethra and thighs. It controls the ejaculation of *Shukra* [semen] and excretion of *Artava* [menstrual fluid], *Mala* [Stool], *Mutra* [urine] and *Garbha* [Fetus].

All these Vayus signify the life-form of human beings and control all body functions. Thus control over them means control over the body. *Pranayama* thus enlightens us to gain control over our body which in turn will keep us free from diseases both mentally and physically.

According to BKS Iyengar—

“*Prana* means breath, respiration, life, vitality, energy or strength.”

“*Ayama* means stretch, extension, expansion, length, breadth, regulation, prolongation, restraint or control.”

“*Pranayama* thus means the prolongation of breath and its restraint.”

This control is exercised via various breathing exercises. They are—

1. *Ujjayi Pranayama*
2. *Surya Bhedana*
3. *Nadi Shodhana*
4. *Bhastrika*
5. *Bhramari*
6. *Sitkari*
7. *Shitali*

In this study a combination of these exercises was performed by selected
individuals and their vital capacity was determined by spirometer.

BACKGROUND
Breathing exercises have a profound effect on the well-being of individuals. Also Yoga and Pranayama have been an essential part of Ayurveda since some centuries. Patanjali Yoga Sutras have been elucidated and Yoga Darshana has been well established and studied to explain concepts of Vayu and Vata Dosha in the human body.

MATERIAL AND METHODS
Three healthy individuals with age 19yrs to 21yrs were selected. Their heights and weights were measured. They had no history of any respiratory disorder since childhood and also their family history was non-specific. These individuals included two males and one female. They were given a set of pranayama exercises to perform daily for a period of 7 days. Previous to this their vital capacities were calculated using a simple spirometer. Observations were duly noted.

OBSERVATION

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject</th>
<th>Vital capacity before pranayama</th>
<th>Vital capacity after pranayama</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Boy1</td>
<td>3200ml</td>
<td>3700ml</td>
</tr>
<tr>
<td>2.</td>
<td>Boy2</td>
<td>3100ml</td>
<td>3800ml</td>
</tr>
<tr>
<td>3.</td>
<td>Girl1</td>
<td>2600ml</td>
<td>3100ml</td>
</tr>
</tbody>
</table>

CONCLUSION
As we can observe Boy1 showed an improvement of 500ml capacity, Boy2 showed 700ml improvement and Girl1 showed an improvement of 500ml.

On the basis of the above observations it can be stated that this pilot study showed marked improvement in the vital capacities of the above individuals. As this is a pilot study, to establish conclusive evidence a large sample study should be done.

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