

THE CONCEPT OF APAN VAYU

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ABSTRACT

Ayurveda is one of the ancient and fruitful science for human beings. A science of *Ayurveda* is based on *Tridosha* theory. *Vata* one among three doshas play an important and major role in both health and diseased condition. *Vata dosha* has five divisions namely *Prana*, *Udana*, *Samana*, *Vyana* and *Apana*. *Vata dosha* is the most important factor of *Tridosha* which is responsible for controlling all types of movements. After the digestion of food by *agni* with the help of *Samana Vayu*, *Aahara* is converted into *Saara* and *Kitta* portion. *Kitta* portion of food is eliminated by *Apana Vayu* with the harmonization of other *Prana* and *Vyana Vayu*. *Apana Vayu* is located in *Pakvadhana* and transversed through *Sroni* (pelvis), *Basti* (urinary bladder), *Medhra* (external genital apparatus of sex) and *Uru* (Thighs), It helps in elimination *samirana* (Flatus), *Sakrit* (faeces), *Mutra* (Urine), *Sukra* (Semen), *Garbha* (Fetus), *Artava* (menstrual fluid). In this article an attempt has been made to correlate the physiological activity of *Apana Vayu* with modern medical science

KEYWORDS: - *Ayurveda*, *Apana vayu*, Autonomic nervous system.

INTRODUCTION

A physician can make a person healthy after in depth understanding of physiology of the body. The purpose of *Ayurveda* science is to maintain the health of the healthy and cure disease of diseased. In *Ayurveda* health is a state where *Dosha*, *Agni*, *Dhatus*, waste products, all physiological functions should be in homeostatic state and soul, sense organ and mind should be in a state of total wellbeing^[1] *Vata Dosha* perform various functions like; in its normal state maintains the function of organs and organ system. *Vata* is the initiating and controlling factor of the human body and also responsible for all types of movements.^[2] Increased demand of *Ayurveda* science in the present society is

required to understand the depth of *Ayurvedic* principles on criterion of modern medical science in an easy mode. In this review we are trying to identify anatomical structures based on its physiological function retrospectively described under the function of *Apana vayu*. *Acharya Sushuruta* has told about *Apana Vayu* is situated in the lower bowels and by this *vayu* faeces, urine semen, foetus and menstrual fluid are brought down (and expelled) at appropriate times upon being ventilated, it produces serious diseases located in the bladder and rectum. *Acharya Charaka* has told that *Vayu* is life, strength and sustainer of creatures *Vayu* is the entire word, it is the master (of all)

The person whose Vayu is with, unimpeded movement and in normal state lives long for hundred years devoid of disorders. that (Vayu) is of five types- *Prana, Udana, Samana, Vyana and Apana*. it coordinates the body well while moving unimpededly in (different) places. Testicles, urinary bladder and penis, navel

thighs groins, anus these are the seats of *Apana vayu*. It releases semen, urine, faeces, menses and foetus while situated in intestine According to *Acharya Vagbhatta Apana Vayu* is mainly situated in the lumbo-sacral region , vesicle area, penis (or genital parts) and thighs and control the passing out or excretion or moving out of *Sukra* (Semen) *Artava* (Menstruation), *Sakrt* (faeces), *Mutra* (Urine) and delivery of the *Garbha* (foetus).

DISCUSSION

Shukra Niskramana

Ejaculation is a physiological process heavily controlled by the autonomic nervous system. It consists of two main phases: emission and expulsion. The main organs involved in ejaculation are the distal epididymis, the vas deferens, the seminal vesicle, the prostate, the prostatic urethra, and the bladder neck.^[3]

Ejaculation is a two-part spinal reflex that involves emission, the movement of the semen into the urethra and ejaculation proper the propulsion of the semen out of the urethra at the time of the orgasm. The afferent pathways are mostly fibers from touch receptors in the glans penis that reach the spinal cord through the internal pudendal nerves .Emission is a sympathetic response integrated in the upper lumbar segments of the spinal cord and affected by contraction of the smooth muscle of the vasa deferentia

and the seminal vesicles in response to stimuli in the hypogastric nerves. The semen is propelled out of the urethra by contraction of the bulbocavernosus muscle a skeletal muscle. The spinal reflex centers for this part of the reflex are in the upper sacral and lowest lumbar segments of the spinal cord and the motor pathways transverse the first to third sacral roots and the internal pudendal nerves.^[4]

Mutra Niskramana

It mean micturition , one can see that as the bladder fills many superimposed micturition contractions begin to appear as shown by the dashed spikes. They are the result of a stretch reflex initiated by sensory stretch receptors in the bladder wall, specially by the receptor in the posterior urethra when this area begins to fill with urine at the higher bladder pressures sensory signals from the bladder stretch receptors are conducted to the sacral segments of the cord through the pelvic nerves and then reflexively back again to the bladder through the parasympathetic nerve fibers by way of these same nerves. When the bladder is only partially filled these micturition contractions usually relax spontaneously after a fraction of a minute the detrusor muscles stop contracting and pressure falls back to the baseline. As the bladder continued to fill the micturition reflexes become more frequent and cause greater contractions of the detrusor muscle.^[5]

Mala Niskramana

After the *Sara-Kitta* division, solid waste i.e. stool is formed. When there is urge for defecation sphincters in the rectum gets dilated and stool is thrown out through anus.

When *Apana Vayu* gets disturbed retention or incontinence can occur.

Most of the time the rectum is empty of feces this results partly from the fact that a weak functional sphincter exists about 20 centimeters from the anus at the junction between the sigmoid colon and the rectum. There is also a sharp angulation here. That contributes additional resistance to filling of the rectum. When a mass movement forces feces into the rectum, the desire for defecation is normally initiated immediately, including reflex contraction of the rectum and relaxation of the sphincters. Continual dribble of fecal matter through the anus is prevented by tonic contraction of (1) the internal and sphincter a several centimeters long thickening of the circular smooth muscle that lies immediately inside the anus and (2) the external anal sphincter, composed of striated voluntary muscle that both surrounds. The internal sphincter extends distal to it. The external sphincter is controlled by nerve fibers in the pudendal nerve, which is part of the somatic nervous system and therefore is under voluntary conscious or at least sub-conscious control, subconsciously, it is usually kept continuously constricted unless conscious signals inhibit the constriction.

Defecation reflex: ordinarily, defecation is initiated by defecation reflexes. One of these reflexes is an intrinsic reflex mediated by the local enteric nervous system in the rectal wall. This can be described as follows. When feces enter the rectum, distention of the rectal wall initiates afferent signals that spread through the myenteric plexus to initiate peristaltic waves in the descending colon, sigmoid and rectum, forcing feces

toward the anus. As the peristaltic wave approaches the anus, the internal anal sphincter is relaxed by inhibitory signals from the myenteric plexus, if the external anal sphincter is also consciously, voluntarily relaxed at the same time, defecation occurs.

However, the intrinsic myenteric defecation reflex functioning by itself is relatively weak. To be effective in causing defecation, it usually must be fortified by another type of defecation reflex, a parasympathetic defecation reflex that involves the sacral segments of the spinal cord. When the nerve ending in the rectum are stimulated, signals are transmitted first into the spinal cord and then reflex back to the descending colon, sigmoid, rectum and anus by way of parasympathetic nerve fibers in the pelvic nerve. These parasympathetic signals greatly intensify the peristaltic waves as well as relax the internal anal sphincter and thus convert the intrinsic myenteric defecation reflex from a weak, effort into a powerful process of defecation that is sometimes effective in emptying the large bowel all at once all the way from the splenic flexure of the colon to the anus.

Artav Niskramana

Menstruation is caused by reduction of estrogens and progesterone, especially progesterone, at the end of the monthly ovarian cycle. The first effect is decreased stimulation of endometrial cell by involution of the endometrium itself to about 65% of its previous thickness. Then during 24 hours preceding the onset of menstruation the tortuous blood vessels leading to the mucosal layers of the endometrium become vasospastic presumably because of some

effect of the involution, such as release of a vasoconstrictor material, possibly one of the vasoconstrictor types of prostaglandins that are present in abundance at that time. The vasospasm, the decrease in nutrients to the endometrium, and the loss of hormonal stimulation cause beginning necrosis in the endometrium especially of the blood vessels. As a result blood at first seeps into the vascular layers of the endometrium and desquamates. The mass of desquamated tissue and blood in the uterine cavity, plus contractile effects of prostaglandins or other substances in the decaying desquamate, all acting together, initiate uterine contractions. That expel the uterine contents.^[6]

Samirana Niskramana:

Gas in the intestinal tract or gas passed through the anus is known as flatus. Components of the flatus are:

The flatus is mainly composed of Nitrogen, Hydrogen and Carbon dioxide. The Carbon dioxide content is higher among people who drink carbonated beverages regularly. The flatulence is usually only foul smelling where it contains gases that smell such as sulphur, although it is normal for the flatus to smell a bit.

Mechanism of flatulence

Sensory nerve endings present in the rectum and anal canal can detect pressure exerted by the bulk of a stool. As this pressure mounts a person feels the urgency to pass the stool the flatus that gathers in the lower intestine and colon also exerts pressure and triggers a need to pass wind. Actually the myenteric plexus which is present in the large intestine stimulated by sympathetic and parasympathetic nerves accelerate the gut mortality resulting of passes of wind.^{[7][8]}

Garbha Nishkramana¹

When conception occurs the cervix gets dilated and uterine muscles start contractions. This total phenomenon is control of *Apana Vayu*. Vitiating of *Apana Vayu* leads to miscarriages or abortions. In primates including humans, there is an increase in fetal CRH (Cortico-tropic releasing hormone), which stimulates the release of ACTH, which stimulates the secretion of androgen in foetal adrenal cortex. In placenta, androgen is converted into estrogen, which causes the release of prostaglandins, which initiate contraction. Number of oxytocin receptors in the myometrium and the deciduas increases more than 100 folds during pregnancy and reaches a peak during early labor. Estrogen increases the number of oxytocin receptors. Once labor is started, the uterine contractions dilate the cervix and this dilation in turn sets up signals in afferent nerves that increase oxytocin secretion. Oxytocin increases uterine contractions in two ways (1) it acts directly on uterine smooth muscle cell to make them contract (2) it stimulates the formation of prostaglandin on the decidua. The prostaglandin enhance the oxytocin induced contractions.^[9]

CONCLUSION

Anything in the body that involves mobility and movement involves *Vata* like bowel movements, nerve impulses, speech etc. *Apana Vayu* is based on the colon and pelvic cavity its primary movement is downward and out of the body. It can not say the exact equivalent of *Apana Vayu*, as it has a varied range of functions like controlled expulsion of semen, menstrual discharge, feces, urine,

flatus. In modern aspects these function are carried either by hormones or plexus or parasympathetic activities. So all these comes under the broader term as *Apana Vayu*. It can be conclude that it is a type of force or action potential that expels the things out of the body, in downward direction.

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