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RESEARCH ARTICLE

REVIEW ARTICLE ON THE CONCEPT OF PRANAVAHA SROTHAS

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Abstract

In Ayurveda, Srotasis defined as the passages through which the various dhatusthat are undergoing the process of metabolic transformation are transported. The process of transformation of dhaturequires the action of Agni.Srotasasare related to the metabolic state of their corresponding tissues through different tissues. Srotasasare also described to be the structures from which the contents move out, or ooze out, or transude out. Nutrient substances are supplied to various tissues via Srotas. It has a significant role in the maintenance of the equilibrium of body elements. Their continuous and proper functioning is the factual cause for healthy state of the body; therefore, any obstruction in this process leads to disease. Right from birth to death Swasochhvasakriyais the sign of life. The act of respiration is the physiological function of Prana vata. The word Pranavaha srotasmeans a channel or path through which the external air enters into the body to sustain life.Chakrapani states that Prana indicates one of five types of Vatadosha. As it has been earlier mentioned that, all the activities in which Pranavayu is directly or indirectly involved to denote either life or the sustenance of life. Therefore, Pranavaha srotasis the most important factor for thelongevity.

Introduction:-

InAyurveda,theconcept of Srotasis mentioned veryspecifically.Thevitiation,depletionandmaintenanceof body structures are never possible without the involvement of Srotas.TheSrotasaredefinedasthechannelsthrough whichtheconductionofvarioussubstancesorelements takesplace.Srotasarethechannelswhichcarrythe Dhatu or the tissue elements or their constituents undergoing transformation to their destination1. TheSwaroopaoftheseSrotasisdescribedastheircolour is similar to that of the Dhatu they carry, theseare tubulareitherlargeorsmallinsize, andeitherstraightor reticulatedinshape2.Thesearetheholloworgans predominantlyconstitutedbyAakashaMahabhuta. Aacharya Charaka has categorised 13 Srotas3andAacharyaSushrutahasdescribed11pairofSrotas4onthebasisof clinicalutility.TheseSrotasorchannelsarenamed accordingtothesubstancewhichtheycarryin themlike PranavahaSrotas, UdakavahaSrotas, RasavahaSrotasetc.

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“Life starts with breath ends with breathlessness; this breath is maintained throughout the life by Pranavaha srotasalong with its Moola sthanas. Pranavaha srotasis one of the most important systems in the body.ThewordPranaisderivedfromtheSanskritroot“An”withaprefix“Pra”.“An”meanstobreath,tolive5. One of themeanigsof theroot"Pra"istofulfil6,whereasone ofthemeaningof"Na"isthenasal.Thus,thewholeword Pranameansthefulfilmentthroughthenasalpart,which isnecessaryfortheprolongationoflife. According to Chakrapani Pranavahasrotas are the channels through which the pranavayu flows.Acharya Sushruta has described Dwadasha Pranaas7.ThePitta,Sleshma,Vayu,thethreeprimary qualitiesofSattva,RajasandTamas,thefivesense organs,andbhutatmaaretermedasPrana.AcharyaCharakainvariouscontextshassaidVata,8Anna9andRakta10asPrana.Th eallthe activitiesofthe bodyaredonebyVataanditisthePranaoftheliving entities.Pranaisalsooneofthefivetypesof Vayu.Vatawithits fivedivisionsPrana,Udana,Samana,Vyana,andApanaappropriately sustains the body by its unimpaired movementsinthelocationsconcerned.11

Materials And Methods:-

Classical Ayurveda texts like charaka samhitha, susruthasamhitha, Ashtanga hridaya, sargdharasamhita

Discussion:-

Prana Vayu which is transported by PranavahaSrotasis located in Murdha (head), Ura(chest),Kantha(throat),Jihva(tongue),Asya(mouth), Nasika (nose). It performs functions likeShthivana(spitting or salivation), Kshavathu (sneezing),Udgara(eructation),Shawasa(respiration),Ahara(deglutination of food)etc.12According to Charaka hridaya and mahasrotas are the moolasthana of pranavaha srotas. According to Susrutahridaya and rasavahinidhamani are the moolasthana of pranavaha srotas.

According to charaka and susruthaHridaya as a moola of pranavaha srothas because of its role in pranavahana karma. Hridayais is responsible for taking impure blood and pumps it to lungs for purification(oxygenation). After receiving this oxygenated or the pure blood , heart pumps it to all body tissues. According to sharangdharashwasanakriya that the pawana named prana goes out to take ambarapiyusha after coming in contact with Hridaya.13 In the context of vega dharanaAcharya charakamentioned about hridrogain sramaswasadharana , which are having direct relation with Pranavaha Srotas.14“Moolam Hridayam” signifies the pulmonary arteries originating from the heart and trans- verse towards the lungs. He also accounts the bronchioles branching out from both the bronchi. Thus the deoxygenated blood, brought by pulmonary arteries gets spread over the surface of the lungs and after getting oxygenated with the “Pranavayu” carried in by bronchioles the blood goes back in to the heart through the pulmonary veins.

Acharya Charaka has mentioned Mahasrotasas Mula of Pranavaha Srotas.CharakahasgivenMahasrotasasasynonymofKostha.According to Sushruta ,Kostha includes Amashaya, Agnyasaya, Hridaya, Unduka, Puppusa etc. Therefore, it can be concluded that, Mahasrotas isan organ ofrespiration. InSharngadharaSamhita,itismentionedthat Pupphusa is the Adhara for Udanavayu15. Moreover, Udanavayu is the one, which helps inUcchwasakriya.ThisalsosupportsPuppusaasMahasrotas. According to Susruta, Phupphusaas“ sonitaphenaprabhava”. Here the phenadhaturesembles the lightest part of blood which is rich in Vayu and Aakashamahabhutas, by that the lungs resembles a cluster of bubbles or multiple air filled sacs for providing a large surface area for gaseous exchange as in alveoli. So it is clear that shonitaphenaprabhava indicates the functional anatomy oflungs.Shwasa&Hikkadiseases areassociatedwithPranavahaSrotas .PrabhavaSthanaofswasa andhiikkaareKosthaasAmashyaorNabhi whicharepartsofMahasrotas,thisjustifiestheroleof MahasrotasasMulaofPranavahaSrotas.

Rasavahinidhamaniis the name given to the arteries which helps in taking pure and nutritionally rich blood from phuphusa to Hridayaand then to all body tissues. Hridayais the seat of Ojas,Prana and root of the Rasavahasrotasalso. Hence, it is clear that these sirascarry the Ojasor the Prana from heart to the smallest unit of body as they further divide into numerous branches and attain the name Mahaphala. Prana reaches to every corner of the body through Rasavahidhamaniand then performs the functions. So thereby Rasavahidhamaniis considered as Moolasthana as mode of transportation.

Physiology of Respiration:
According tosharangdharaPranavata situated in the nabhi comes to hridaya& from hrdaya it goes out to environment through throat to drink vishnupadamrtha. After taking atmospheric air it enters the body again through pranavaha srotas to nourish the whole body & to stimulate the digestive fire for the proper digestion of food.

नाभिस्थ: प्राणपवन:
nabhi is the centre of prana vayu. According to Ashtanga hridayamoordha is the center of prana vayu. Respiratory centers situated in moordha. Respiratory centers are medullary and pontine centers. Medullary centers include dorsal and ventral group of neurons. Pontine centers include apneustic and pneumotaxic centre. **कण्ठाद्बहिर्विनिर्याति related to** diffusion of carbon dioxide from alveoli to atmosphere.**स्पृष्ट्वाहृत्कमलान्तरं :** Hrutkamala means heart,hrutkamalantaram means lungs.**पातुंविष्णुपदामृतम्** may be related to the diffusion of oxygen from atmospheric air to alveoli.**पीत्वाचांबरपीयूषंपुनरायातिवेगत:। related to the** Pressure gradient responsible for easy and fast transport.**प्रीणयन्देहमखिलंजीवयन्जठरानलम्।** may be related to the exchange of gases at tissue level , Cellular metabolism using oxygen.

Pranavaha srotho dushti nidana:
According to charaka wasting, suppression of natural urges, Indulgence in unctuous things, performance of exercise while hungry & such other harmful regimens are lead to pranavaha srotho dushti. Acharya vagbhata mentioned pipasavegadharana also lead to pranavaha srotho dushti. Here rookhana taken as dryness in passage. It means lack of mucus and surfactant. Mucus functions as primary line defence.

General srothodushtilakshana:
Sangabeing obstructed or causing obstruction. In Pranavasrotassanga may be due to phlegm, inflammation or the foreign materialwhich is causing obstruction for the flow of air.Atipravrthi is the increased movement or motilityor increased secretion of mucus.Vimargagamanarelated to the deviation from normal direction of flow of air or mis directed flow of fluid. Sanga and atipravrtti can lead to vimargagamana. Siragranthi may be the engorgement blood vessel.

Pranavaha Srotodushti Lakshana:
Aacharya Charaka has described the Pranavaha Srotodushti LakshanaasAtishrushtam(Prolongedrespiration), Atibadham(Toorestrictedrespiration)Kupitam(Painfulorexacerbateddyspnoea)Alpalpam (Breathing with interruption) Abheekshanam (ContinuousbreathingorContinuous Dyspnoea)Sashabdham (Auscultatory sounds like Ronchi, Crepitus), Sasholam (Painfulrespiration).

Acharya susrutha has mentioned pranavaha srotho vidhalakshanasakrosana(to cry), vinamana (to bend down like a bow), mohana(faintness), bhramana(vertigo), vepana(tremors), marana (death). According to Ashtanga hridaya, unconsciousness ,tremors, distension of abdomen, vomiting ,fever, delirium, pain, obstruction of urine and stool and death are the symptoms of pranavaha vidhalakshanas.

अतिसृष्टम्(INCREASED RATE, FORCE, INCREASED MUCOUS PRODUCTION ETC):
Tachypnoea occurs in nervous subjects, fever, acute pulmonary infection , obstructive airway disease, acute pulmonary edema. Deep sighing respiration seen in metabolic acidosis in renal failure , DM, starvation.Cheyne stoke respiration seen in neurological disorder, cerebral haemorrhage(hyperpnea). In hyperventillation also rate &force of breathing is increased. Cheyne stoke respiration is alternating periods of apnea lasting for 10-12 seconds. Breathing starts slowly at first increase in rate and amplitude and then apnea. Biots breathing is apnea interspersed with irregular breathing.

In case of sputum production:
Watery sputum seen froathyvolumnious blood tinged in pumonaryloedema. Mucoid sputum or clear viscous sputum occurs in chronic bronchitis. Froathysaliva seenin bronchio alveolar carcinoma. Sticky sputum seen in chronic bronchitis. Purulent (pus yellowish /greenish)sputum occurs in infection. Rusty sputum seen in pneumococcal infection , pneumonia. Red current jelly sputum seen in bronchiogenic carcinoma. Foul smelling sputum occurs alsoin infection. Reddish brown /anchovy sauce sputum seen in breaking of amoebic liver /lung abscess.

Haemoptysis:
Streaky haemoptysis + purulent sputum seen in bronchiectasis & lung abscess**.** Massive amount of blood, streaky haemoptysis seen in pulmonary TB**.** Red jelly haemoptysis seen in bronchiogenic cancer.

Abheekshanam:
In cheyne stoke respiration, hyperpnea condition &in hyperventillationetc**.** In Polypneacondition where rate increased but not force increased.

Athibadhauchasam:
Apnea:Can be voluntary. Occurs after hyperventilation.Degluttition apnea occurs in pharyngeal stage. Apnea can be divided in to vagal apnea, adrenaline apnea, obstructive apnea, central apnea, mixed apnea. Obstructive apnea occurs due to tonsils, adenoids.AnotherCentral apnea seen in brain disorders, in premature babies(short pause in between breathing can be seen).Mixed apnea seen in premature babies,also seen in COPD cases.

ALPALPAM:
Shallow respiration occurs in muscular weakness. Also occurs in condition like hypo ventillation (decreased rate and force). Seen in hypoxia, Bradypnoea conditions. In various types of hypoxia, at first respiratory rate is increased (अभीक्षणम्) .Large amount of CO2 washed then seen shallow respiration(अल्पाल्पम्).

Sashoolam:
Pleural pain is localized to one side, severe stabbing /tearing felt in axilla, beneath breast. It increases with deep respiration , coughing (pleurasy). Also seen in costochondritis (dull localized pain increases during sneezing, coughing , respiration),rib fracture (sudden pain in chest , increased with respiration),pneumonia (stabbing or tearing pain increases with deep respiration).

sashabdam:
may be related to cough .Short dry cough with pain behind jaw occurs in pharyngeal cough .Harsh irritativerepetitive cough seen in laryngeal cough. Cough loses explosive nature (bovine)seenin vocal cord paralysis. Metallic sounded brassy cough seen in tracheal obstruction. Dry cough initially, later mucopurulent sputum in acute bronchitis. Dry cough first later productive with rusty brown seen in pneumonia. Intermittent cogh with wheezing and breathlessness & cough worse at night , sticky sputm seen in bronchial asthma. Persistent and progressive cough seen in bronchiogenic cancer. Copiouscough expectoration comes on changing posture seen in bronchiectasis. Subtotal or partial obstruction with clicking sound during breathing occurs in aspiration of foreign body.

Wheeze occurs due to partial obstruction of bronchial lumen in bronchial asthma. Rhonchi localized seen when bronchi obstructed due to secreations , lymph node , foreign body. Rhonchi is the crunching sound while auscultating area over surgical emphysema. Wheezes when heard by auscultation are termed as rhonchi. Rhonchi is the high pitched whisting sound.it occurs due to airway narrowing due to inflammation, mucus and muscle spasms in the wall of the airways. In Asthma, the airway is narrow. In Copd there is excess mucus . Rhonchi is the continuous low pitched, rattling sound often resembling snoring obstruction or secretions in larger airways. Rhonchi seen in condition like copd, bronchiectasis, pneumonia, chronic bronchitis, cystic fibrosis.In diabetic coma, uremia there is expiration with hissing sound. Stridor is the inspiratory adventitious sound due to obstruction of larynx or trachea.Inspiratory stridor seen in pertussis. Laryngyssmus stridor seen in tetany

kupitham:
Dyspnoea, it is the uncomfortable awareness of respiratory effort. All the above srotho dushti lakshana can be taken within **कुपितम्.**

Treatment of pranavaha srotho dushti is same as that of swasa chikitsa. Any other treatment which subsides kapha & vata, which is hot causing downward movement of vata should be adopted specially those which subsides maruta.

Conclusion:-

ThePranavahaSrotasisofveryvitalimportance inmaintainingnormalfunctioningofhumanbody.It plays multidimensional role by virtue of very vital

substanceitcarriesthroughitthatisPranaVayu.HridyaandMahasrotasarethemoolasthanaofPranavaha Srotas and are mainly vitiated in the diseases of Pranavaha Srotas and the RasavahaDhamani are involved intransportation ofPranaVayuin thebody. PranavahaSrotasshouldnotbestudiedonly withthecorrelationofrespiratorysystembutitmustbe studiedincontexttoothermajorsystemslikenervous
system(regulationofrespiration),cardiovascularsystem(transportationofPrana),andalimentarycanal(diseases ofPranavahaSrotaslikeShwasa,Hikkahavetheirorigin inMahasrotas).

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