

**TRAYO ROG MARGA & TRILAMINAR GERM DISC****Chopde Sarika S**

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**ABSTRACT**

*Trayo roga marga* (3 possible routes for the progress of a disease) is a unique concept described by *Acharya Charak*. This elaborates the probable sites of pathogenesis of various diseases taking place in the body. According to *Ayurvedic* concept, the disease takes place where there is a weakness at certain part. When the development of a baby takes place & if there is a vitiation of certain part of the *beeja*, it will definitely give rise to some deformity. In order to prevent this, *Ayurved* describes the regimen to be followed before going for conception & after the conception. This review article enlightens this very importance of embryological development & its relation with the 3 major routes of the disease. If we are able to predict the disease in advance we will be able to prevent it before it affects the person.

**Keywords-** *Trayo roga marga*, trilaminar germ disc

**INTRODUCTION**

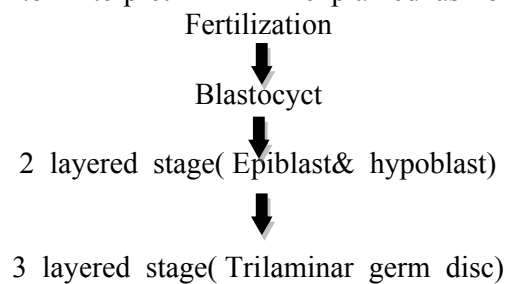
According to *Ayurved*, there are 3 main routes (*Trayo Roga Marga*) in which the pathogenesis of a disease takes place.

According to Embryology in modern science, the body develops from 3 main layers of cells termed as Trilaminar Germ Disc. In this article an attempt has been made to interpret if

there is any co- relation between the germ disc & *rogmargas*.

**Trilaminar germ disc**

From a single cell, a full grown human being is formed. This process takes place by division of cells forming 3 main layers known as ectoderm, endoderm & mesoderm. The process can be explained as follows



These 3 layers form different organs as described in the following chart

Layer	Organs formed
<b>Ectoderm</b>	1) CNS 2) PNS 3) Sensory epithelium of ear, nose & eyes 4) Skin, hair & nails 5) Pituitary gland 6) Mammary gland 7) Sweat gland 8) Enamel of tooth
<b>Mesoderm</b>	1) Muscles 2) Bones & cartilages 3) Dermatome 4) Heart, arteries, veins 5) Blood 6) Lymph vessels & lymph cells 7) Kidneys & ureters 8) Gonads 9) Spleen 10) Cortex of suprarenal gland 11) Pericardium, perito-

	neum & pleura 12) Mesentery 13) Diaphragm 14) Muscles of GIT
<b>Endoderm</b>	1) Epithelial lining of GIT , RT , Urinary bladder 2) Parenchyma of thyroid gland , parathyroid , liver , pancreas 3) Epithelial lining of Tympanic cavity & auditory tube 4) Internal lining of larynx
<b>Ectoderm</b>	+ Ventral & lateral body wall
<b>Mesoderm</b>	
<b>All layers</b>	1) Skull 2) Muscle of mastication 3) Cartilages of larynx

**Trayo Rog Margas**

ŞÉrÉÉâUÉâaÉqÉÉaÉÉİ CİİÉ-  
vÉÉZÉÉqÉqÉÉİİxjÉxÉIkÉrÉ:

MüÉâwP'cÉ

İİÉŞÉvÉÉZÉÉU£üÉSrÉÉâkÉÉİÉuÉxiu  
ÉMç ücÉ xÉ  
oÉÉ½ÉâUÉâaÉqÉÉaÉİ:qÉqÉÉİİhÉm  
ÉÑİÉoÉİİxiÉySrÉqÉÔkÉÉİİSİİÉ,AİxjÉx  
ÉIkÉrÉÉâAİxjÉxÉÇrÉÉâaÉÉxiÉŞÉÉâm  
ÉİİÉoÉkSÉ'cÉxiÉÉrÉÑMühQûUÉ:, xÉ  
qÉkrÉqÉÉâUÉâaÉqÉÉaÉİ:  
MüÉâwPmÉÑİÉÂcrÉİÉâqÉWûÉxÉèÉâİ  
É:

vÉUİUqÉkrÉÇqÉWûÉİÉqlÉqÉÉqÉmÉ  
YuÉÉvÉrÉ'cÉâİİÉmÉrÉÉİrÉvÉoSæxiÉİ  
ŞÉæxÉUÉâaÉqÉÉaÉİÉPrÉİİÉU: | cÉ.  
xÉÔ. 11/48

There are 3 main pathways in which the pathogenesis of a disease takes place.

**1)Bahyarogmarga ( Outer pathway)**

It comprises of 7 dhatus & twak( skin). Though all the dhatus are present all over the body, here they symbolize the branches of a tree. Actual nourishment of these dhatus occurs from stem. This very stem is nothing but the Rasa dhatu.

AŞÉvÉÉZÉâİÉxÉÇÆÉÉMüUhÉÇurÉu  
ÉWûÉUÉjÉİÇİÉjÉÉU£üÉSİİÉÇkÉÉİÉ  
ÑİÉÉÇvÉÉZÉÉİpÉkÉârÉÉİÉÉÇuÉxÉ  
vÉÉZÉÉİÉÑsrÉİuÉâİÉ

oÉÉ½İuÉÆÉÉmÉİÉÉjÉİqÉÇ|| cÉç. xÉÔ.  
11/48- cÉçümÉÉİhÉ

Rasa is the primary dhatu formed after digestion. It then forms all the other dhatus sequentially. Skin is termed as an updhatu of rasa. Rasa also nourishes panchmahabhutas(5 elements forming sense organs),

joints , muscles , ligaments & vessels. In short, Rasa forms each & every part of the body.

**2) Madhyam marga( Middle pathway)**

It consists of the tri marma{ 3 vital organs-basti( urinary bladder) , hriday ( heart) & murdha(head)}.It also comprises of asthi( bones), sandhi(joints), snayu(muscles/ ligaments) & kandara(tendons).The tri marma are the places where the prana(life) resides. They are well protected by bony cages

- Head – by skull, Heart- by thoracic cage, Bladder – by pelvic girdle.
- Along the bones come the muscles/ligaments/fascia/tendons/joints

Hence we can say that this route mainly comprises of musculoskeletal system.

**3) Abhyantar marga( Internal pathway)**

It comprises of koshtha. The definition of koshtha is described as follows.

MüÉâwPmÉÑİÉÂcrÉİÉâqÉWûÉxÉèÉâİ  
É:vÉUİUqÉkrÉÇqÉWûÉİÉqlÉqÉÉqÉm  
ÉYuÉÉvÉrÉ'cÉâİİÉmÉrÉÉİrÉvÉoSæxi  
ÉİŞÉæxÉUÉâaÉqÉÉaÉİAprÉİİÉU:| cÉ.  
xÉÔ. 11/48

According to Charakacharya, koshtha can be considered as a cavity situated in the lower & middle part of the body which holds the organs like amashaya , pakvashaya etc. Hence abdominal cavity can be considered as a koshtha.

The diseases like kasa( cough) & swas( dyspnoea) appear as the respiratory symptoms but they originate in the amashaya(stomach) according to Ayurved.

According to Acharya Susrut, thoracic as well as abdominal cavity can be

considered as koshta. Hence the organs situated in the thorax & abdomen can be considered as abhyantara rogmarga.

**Diseases of the outer pathway**

iÉŞÉaÉhQûîmÉQûMüÉsÉerÉmÉcÉİcÉ qÉİMüĐsÉÉİkÉqÉÉÇxÉqÉwÉMüMÑü wPurÉÇaÉÉSrÉÉâ İuÉMüÉUÉ oÉİWûqÉÉİaÉİeÉÉ'cÉ İuÉxÉmÉİ'ruÉrÉjÉÑaÉÑsqÉÉvÉÉâİuÉ SİkrÉÉSrÉ: vÉÉZÉÉİÉÑxÉÉËUhÉÉâ pÉuÉİİİÉ UÉâaÉÉ: | cÉç. xÉÔ. 11/49

All these have signs & symptoms occurring over the surface of the body. Disease like *visarpa* is an exception which also occurs in the innermost route as well as outer route.

**Diseases of the middle pathway**

mÉ²ÉuÉkÉaÉëWüÉmÉİÉÉİÉMüÉİSİİÉ vÉÉâwÉUÉeÉrÉ²qÉÉİxjÉxÉİkÉvÉÔs ÉaÉÑSpÉëÇvÉÉSrÉ: İvÉUÉâ»SrÉoÉİxiÉUÉâaÉÉSrÉ'cÉ qÉkrÉqÉÉaÉÉİİÉÑxÉÉËUhÉÉâ pÉuÉİİİÉ UÉâaÉÉ: | cÉç. xÉÔ. 11/49

Out of all the above diseases, *gudabhransh*(rectal prolapse) involving pelvic organ consists of *sushirsnavu*(sphincter) situated at the end of rectum. So even if it is a *kosthanga*, due to non functioning of *snayu* it is included in the middle pathway. The diseases like *Shosha* & *Rajyaksma*( both caused by depleting *dhatu*s) involve musculoskeletal system. Hence despite of

involvement of *dhatu*s, they are considered under this route & not the outer route.

**Diseases of the inner pathway**

euÉUÉİÉİxÉÉUcNû±İsÉxÉMüİuÉxÉÔİ cÉMüÉMüÉxÉ'uÉÉxÉİWûYMüÉİÉÉW ūÉâSUmSÉİWûÉSrÉÉâAliÉqÉÉİaÉİeÉ É'cÉ İuÉxÉmÉİ'ruÉrÉjÉÑaÉÑsqÉÉvÉÉâİuÉ SİkrÉÉSrÉ: MüÉâwPÉİÉİÑxÉÉËUhÉÉâ pÉuÉİİİÉ UÉâaÉÉ: | cÉ. xÉÔ. 11/49

*Jwar*(fever) originates in the *amashaya*. *Gulma* is formed in the abdominal cavity. *Shwayathu* occurs all over the body due to blocking of the *Srotas*(channels) .*Vidradhi* is the severe version of *shotha* occurring in oral cavity .*Arsha*(hemorrhoids) is located in the anal canal.

All the above disease appear due to the vitiation of *Agni*.

Some of the diseases are found in more than one pathway

e.g. *Visarpa*- Outer & inner pathway, *Shwayathu*- Outer & inner pathway, *Arsha*- Outer & inner pathway, *Vidradhi*- Outer & inner pathway

These disease are curable when they are in the outer pathway. When they reach the inner pathway they become incurable or difficult to cure.

Following chart states the diseases of respected *rogmargas* & the embryological origin of that organ

Pathway	Disease	Organ / dhatu/ system etc. involved	Embryological origin
Outer pathway	<i>Ganda</i> (Mumps)	<i>Twak , mamsa</i>	Ectoderm
	<i>Pidaka</i> (Acne)	<i>Twak , mamsa</i>	Ectoderm
	<i>Alaji</i>	<i>Twak , mamsa</i>	Ectoderm
	<i>Apachi</i>	<i>Twak , mamsa</i>	Ectoderm
	<i>Charmkeel</i> (Mole)	<i>Twak , mamsa</i>	Ectoderm
	<i>Adhimamsa</i> (Growth)	<i>Twak , mamsa</i>	Ectoderm
	<i>Mashak</i> (Mole)	<i>Twak , mamsa</i>	Ectoderm
	<i>Kushtha</i> (skin disease)	<i>Twak , mamsa, rakta, ambu</i>	Ectoderm , mesoderm
	<i>Vyanga</i> (skin discoloration)	<i>Twak, rakta</i>	Ectoderm , meso-

			derm
	<i>Visarpa-Shakhagat</i>	<i>lasika, twak, mamsa,</i>	Ectoderm
	<i>Shwayathu- Shakhagat</i>	<i>Twak</i>	Ectoderm
	<i>Arsha-Shakhagat</i>	<i>Twak,mamsa</i>	Ectoderm
	<i>Vidradhi- Shakhagat</i>	<i>Twak</i>	Ectoderm
<b>Middle pathway</b>	<i>Pakshwadh</i> (paralysis)	<i>Snayu, sira</i>	Mesoderm
	<i>Graha</i> (muscle stiffness)	<i>Snayu</i>	Mesoderm
	<i>Aptanak</i> (tetanus)	<i>Snayu</i>	Mesoderm
	<i>Ardita</i> ((facial palsy)	<i>Snayu</i>	Mesoderm
	<i>Rajyakshma</i>	<i>Dhatu</i>	Mesoderm,endoderm
	<i>Asthisandhishool</i> (pain in bones & joints)	Bones & joints	Mesoderm
	<i>Gudabhransha</i> (rectal pro-lapse)	Rectum & anal canal	Mesoderm
	<i>Shiroroga</i> (diseases of head)	Head	All layers
	<i>Hridroga</i> (diseases of heart)	Heart	Mesoderm
	<i>Bastiroga</i> (diseases of urinary bladder)	Urinary bladder	Mesoderm, endoderm
<b>Inner pathway</b>	<i>Atisar</i> (diarrhoea)	GIT	Endoderm
	<i>Chardi</i> (vomiting)	GIT	Endoderm
	<i>Alasak</i> (Bowel disease)	GIT	Endoderm
	<i>Visuchika</i> (Bowel disease)	GIT	Endoderm
	<i>Kasa</i> (cough)	Stomach	Endoderm
	<i>Shwas</i> (dyspnea)	Stomach	Endoderm
	<i>Hikka</i> (hiccups)	Stomach	Endoderm
	<i>Anaha</i> (abdominal discomfort)	Abdominal cavity	Endoderm
	<i>Udar</i> (ascites)	Abdominal cavity, liver	Endoderm
	<i>Pleeha</i> (splenomegaly)	Spleen	Endoderm
	<i>Visarpa</i>	<i>Rakta, dhatu, mala, dosha</i>	Mesoderm, Endoderm
	<i>Shwayathu</i> (swelling)	<i>Koshtha</i>	Endoderm
	<i>Gulma</i> (abnormal growth in the cavity)	<i>Koshtha</i>	Endoderm
	<i>Arsha</i> (hemorrhoids)	Rectum & anal canal	Endoderm
	<i>Vidradhi</i> (abscess)	<i>Koshtha</i>	Endoderm

The *dhatu* can be explained under mesoderm as it forms muscles, bones, cartilages, blood, lymph cells, gonads etc.

## DISCUSSION AND CONCLUSION

From the above chart it can be stated that, all 13 organs of *bahyarogamarga* have their embryological origin from ectoderm & 2 have contribution from mesoderm as well. 10 Organs of *madhyam rogamarga* originate from me-

soderm , a partial contribution from ectoderm & endoderm(3 organs). 15 Organs of *abhyantaramarga* originate from endoderm & a partial contribution from mesoderm (1 organ).

Hence it can be interpreted that there is a close association between ectoderm & *bahyamarga* , mesoderm & *madhyamamarga* as well as endoderm & *abhyantaramarga*.

In *Ayurved Sharir*, the concept of *utpatti*(genesis of a particular organ) is very much important. Maximum vital organs like heart, lungs, liver , kidneys etc. are formed by *raktadhātu*. Hence any person who indulges on diet or lifestyle vitiating *rakta* will land into diseases of these organs. Similarly if the lifestyle of the parents is not healthy it will affect the fetal growth as it will vitiate the embryological layers forming different systems . Probably this is the reason *garbhiniparicharya* (regime to be followed by the pregnant lady) & preconceptional procedures to be followed by both the parents is described in *Ayurved*.

#### SCOPE-

1. If any particular embryological layer is vitiating we can predict the future disease that will affect the child for e.g. if the mesoderm is vitiating, the person is likely to get the musculoskeletal disease

2. Advances in research might be able to prevent the diseases

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