

# Similarity of *Ruta graveolens* to Simple Myopia : A Literature Review.

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## ABSTRACT

Simple (childhood) myopia is one of the common varieties of myopia caused due to uncoordinated increase in axial length of eyeball during the period of body growth. Its prevalence has increased drastically worldwide especially in Asian countries. Apart from heredity, excessive near work associated with urbanisation and competitive education plays a major role in its aetiology. Even though lot of research is going on world over on myopia, there is no standard treatment available up till now to control its progression due to lack of efficacy, side-effects, ethical issues, rebound effect after stopping the treatment etc. Different medicines were mentioned in homoeopathy for myopia, out of these *Ruta graveolens* has more similarity to myopia associated with near work as revealed from references in homoeopathic, historical and botanical literature. So *Ruta* should be used as an organ remedy to control progression of simple myopia.

**Keywords :** Homoeopathy, *Ruta graveolens*, Simple myopia.

## INTRODUCTION

Myopia or short-sightedness is one of the commonest forms of refractive error in which an individual affected has dimness of vision for distant objects but can see near objects clearly. It is defined as that dioptric condition of the eye in which with accommodation

at rest, incident parallel rays come to a focus anterior to light sensitive layer of the retina.<sup>[1]</sup>

*Goss and Eskridge*<sup>[2]</sup> has classified myopia by their clinical appearance as simple myopia, pathologic myopia, night myopia, pseudomyopia and induced myopia. Out of these, simple (childhood) myopia is a common variety of myopia that occurs due to uncoordinated increase in axial length of eyeball during the period of body growth. It usually commences between 5 to 13 years of age; progresses up to 25 years of age and thereafter no further significant changes are observed.<sup>[3]</sup>

## AETIOLOGY OF MYOPIA

Various theories were postulated from time to time about the aetiology of myopia such as heredity, reduced rigidity of sclera, excess near work, systemic diseases, diet etc. Heredity is known from ancient times to play a major role in incidence of myopia. However dramatic increase in incidence and progression of myopia during last decades was mainly attributed to environmental factors, as the genetic make-up has not been changed significantly over such a short period of time. Different studies have reported higher prevalence of myopia among those living in urban areas, occupation with intensive near work and with higher educational levels.<sup>[4]</sup> So it has been claimed by researchers that both genetic and environmental factors especially excessive near work associated with

urbanisation and competitive education plays a major role in the development of myopia.

Different theories were put forward about the mechanism of development of myopia due to near work such as excessive convergence, raised intra ocular pressure, ocular congestion due to posture, retinal defocus theory etc. Out of these later has gained the acceptance due to convincing evidences from different animal and human studies. Incremental retinal defocus theory was put forward by *Hung GK and Ciuffreda KJ* <sup>[5]</sup> which states that during a genetically programmed ocular growth, if there occurs a reduction in retinal defocus magnitude, it leads to decrease in release of neuromodulators from retina. This in turn causes decrease in rate of retinal proteoglycan synthesis, a precursor of scleral matrix material and a decrease in scleral matrix reduces the integrity of sclera resulting in increase in axial growth rate. Repeated episodes of decrease in retinal defocus area associated with prolonged near work can leads to development of myopia. Different human studies have shown weakness of accommodation in myopes than emmetropes. <sup>[2]</sup> This deficient accommodation associated with prolonged near work causes hyperopic retinal defocus that leads to myopia.

## CLINICAL FEATURES OF MYOPIA

Myopic children usually experience no complaints except difficulty in seeing the distant objects. Symptoms of eye strain or asthenopia occurs especially when there is an association of astigmatism or convergence dysfunction. Some patients may complain of seeing dark floating spots in front of eyes. While some have a convergent squint or esophoria at near due to higher AC / A ratio.

## SIGNIFICANCE OF MYOPIA

**Global Prevalence** - Myopia prevalence is increasing drastically among children world over especially in Asian countries. More percentage of children are becoming myopic at an early age. Myopia incidence has been reported to be as high as 70 to 90% among East Asian countries such as in Singapore, Hong Kong, Taiwan and Japan, 30 to 40% in Europe, United States & 10 to 20% in Africa. <sup>[6]</sup> Myopia is rapidly increasing and was estimated to be 1.45 billion in 2010. It has been predicted that if myopia is not controlled, this number will continue to increase from one quarter to

one third of the world's population (2.5 billion) by 2020.

<sup>[7]</sup> Myopia prevalence in India is concerned, it ranges from 6.9 to 14% from various surveys done during year 1983 to 2007.

**Problems faced by myopic individuals** - Higher the degree of myopia, higher is the degree of visual disability. So individuals with higher grades of myopia face variety of problems in future as follows :

*Medical problems* - Higher the grade of myopia more are the chances of development of ocular blinding complications in future such as retinal detachments, glaucoma, choroidal neovascularisation, cataract etc. Similarly lesser will be the predictability of the outcomes of refractive surgery.

*Economic problems* – Progression of myopia in children causes financial burden to their parents due to expenses for regular eye examination & frequent change of glasses or contact lenses with growing age.

*Educational problems* – myopes have limitations in choosing educational field that requires excessive near work such as medical, engineering, law, IT courses etc.

*Occupational problems* - they will be disqualified in services where more visual accuracy is required such as military and transport services.

*Social problems* – Myopic spectacles will affect the personality of an individual especially in cases of females and may create inferiority complex. They can't even participate in sports activities especially athletics, swimming, football etc.

Thus simple progressive myopia not only creates loss at the personal level but also affects the economy and prosperity of the whole nation. So there is a great need to have some measures to prevent the rapid progression of myopia at its early stage and so as to keep individuals in low myopic state.

## TREATMENT OPTIONS FOR MYOPIA AND THEIR LIMITATIONS

Different clinical studies were going on world over in order to control the progression of myopia such as vision therapy techniques (*Bate's therapy*, *Biofeedback*

visual training), use of optical devices (contact lenses, orthokeratology procedure) local use of pharmaceutical agents (Atropine, Pirenzepine, Timolol) etc. However none of these measures are still accepted as standard or universally accepted treatment to control myopia due to lack of efficacy, local or systemic side effects, inconvenience of its use in children, ethical issues associated with its long term use, rebound effect after stopping the treatment etc. <sup>[2]</sup> Laser refractive surgery only corrects the existing myopia, so it is not recommended till myopia gets stabilise. Thus there is a great need to have a medical treatment that will be safe, effective, economical & easy to use to control myopia.

## TREATMENT FOR MYOPIA IN HOMOEOPATHY

A search was done from homoeopathic literature to find out some solution for myopia. In homoeopathy, following medicines are mentioned with their gradation for myopia :

Kent's Repertory – Vision – Myopia – Agar., am-c., anac., apis., arg-n., ars., calc., carb-s., carb-v., chin., cimic., coff-t., con., cycl., dig., euphr., gels., graph., grat., hyos., jab., lach., lyc., mang., meph., mez., nat-a., nat-c., nat-m., nat-p., nit-ac., petr., ph-ac., **Phos.**, **Phys.**, pic-ac., plb., psor., **Puls.**, raph., ruta., sel., spong., stram., sulph., sul-ac., syph., thuj., tub., viol-o., valer., verb., viol-t. <sup>[8]</sup>

Boericke' Repertory – Eyes – Vision - Myopia - Acon., Agar., Aur. mur., Bell., Carbon. s., Euphras., Gels., Lil. t., Nit. ac., Phos., *Physost.*, *Piloc.*, Ruta., viola od. <sup>[9]</sup>

Repertory from Boger's synoptic key of material medica – Vision - Nearsight - Con., Nit-ac., Pho., Pho-ac., Pul. <sup>[10]</sup>

Boenninghausen's Repertory – Eyes - Vision - Myopia - Agar., **Am-c.**, anac., ang., **Ant-t.**, **Calc-c.**, carb-v., **Chin.**, CON., **Cyc.**, euphor., **Euphr.**, form., graph., hep., **Hyo.**, **Lach.**, LYC., mang., meph., mez., nat-c., nat-m., NIT-AC., **Petr.**, PHOS., **Pho-ac.**, phys., plb., PULS., **Rut**, sele., spo., **Stra.**, **Sul.**, **Sul-ac.**, thu., **Val.**, verb., vio-o., vio-t. <sup>[11]</sup>

However these medicines are useful for myopia in

general that includes different varieties of myopia as mentioned earlier. So these medicines have to be categorised according to aetipathogenesis, signs and symptoms of myopia. As far as simple myopia associated with excess near of work is concerned homoeopathic medicines mentioned in literature as per signs and symptoms of myopia were as follows :

- Eye - Looking steadily - into distance agg.: Dig., euphr., ruta. <sup>[8]</sup>
- Eyes - Vision – Agg. – Straining vision : Arg-n., lith-c., nat-m., pic-ac., rut. <sup>[11]</sup>
- Eyes – Vision – Illusion - flies and muscae volitantes : AGAR., am-m., ant-t., aur., **Bell.**, CALC-C., con., caus., chin., **Chi-s.**, cocl., cof., **Con.**, **Dig.**, dul., hep., hyo., mag-c., **Merc.**, nat-m., **Nit-ac.**, op., PHO., plb., pul., **Rhus-t.**, **Rut.**, sec-c., **Sep.**, **Sil.**, spi., **Stra.**, sul., **Tab.**, zin. <sup>[11]</sup>
- Ailments from - Eyes - Over exertion or Strain of : Onos., Ruta, Sulph. <sup>[12]</sup>
- Eye - Pain - Looking – Steadily : Ars., apis., arund., carb-v., caust., chel., cina., nat-a., nat-c., **Nat-m.**, plat., psor., rhus-t., ruta., seneg. <sup>[8]</sup>
- Eyes – Ciliary muscle - Accommodation disturbed : Ipec., Ruta. <sup>[9]</sup>
- Esophoria : Rhod., ruta. <sup>[8]</sup>

## RUTA GRAVEOLENS AND ITS SIMILARITY TO MYOPIA

Out of above medicines, Ruta graveolens (Ruta) seems to have more similarity to myopia associated with near work. This can be appreciated from following points :

### A) Reference from Homoeopathic Literature

- Ruta medicine has ailments from or bad effects from : overstraining eyes, from reading too much, especially fine work at night. <sup>[13]</sup> Excess near work is one of the important factor in rapid progression of myopia.
- Ruta has action on sclerotic portion of eye. <sup>[10]</sup> Reduced rigidity of sclera is responsible for incidence and progression especially in hereditary myopia.
- Moffat and Norton have mentioned in their therapeutic books that “Ruta is clinically of first importance in asthenopia and more often indi-

cated in *weakness of ciliary muscles* than of the internal (medial) recti.” Ciliary muscles are used in the process of accommodation during near work. <sup>[14,15]</sup>

- *Allen T.F.* has specifically mentioned in his book that “Ruta is valuable in *weakness of accommodation* especially in nearsighted people.” <sup>[16]</sup>
- In *Hahnemann’s* book of “*Materia medica pura*” <sup>[17]</sup> provers have stated :  
“ His eyes feel as if he had strained the sight too much by reading “  
“Involuntary staring at an object with contracted pupils - after ½ hr. “
- In *Allen T. F.* book of “*The Encyclopedia of pure material medica*” <sup>[18]</sup> provers have stated :  
“ Sensation of heat and fire in the eyes and aching while reading “ (in the evening, by the light)  
“ He sees distant objects more distinctly than usual; “ and *the prover was myopic.*

## B ) Gradation of Myopia Medicines

A repertorisation was done to study the grade myopia medicines from major repertories with the help of homoeopathic software *Homopath Vital*. <sup>[19]</sup> Rubrics taken for repertorisation were medicines having affinity for eye in general and sclerotic portion of eye in particular, medicines under the heading of myopia and medicines for different signs and symptoms of myopia. Repertorisation result has shown that Ruta covered more rubrics and counted higher number of marks in repertorial totality as compared to other medicines for myopia. ( figure 1)

## C ) Reference from Historical Literature :

Ruta has got long history of its use as a domestic remedy to give strength to the eye. Ancient Egyptians and early Greeks believed that Ruta taken orally could improve their eye sight and it was popular among artists, craftsmen and writers who needed good vision to perform their near work.

Ruta herb is still eaten by Italian in their salads and it was supposed to make the sight both sharp and clear especially when the vision had become dim through over exertion of the eyes. <sup>[20]</sup>

## D ) Reference from Botanical Literature :

Rutin and Quercetin are the Flavonoids in the drug Ruta. <sup>[21]</sup> Numerous publications have reported the

antioxidant properties of flavonoids and even its specific antioxidant effects on the retina. There is a correlation of higher grades of myopia and an elevated level of oxidative processes. So flavonoids in Ruta have got beneficial effects on myopia. Thus Ruta can be considered as a nutritive remedy.

## RUTA AS AN ORGAN REMEDY FOR MYOPIA

Majority of myopic children do not exhibit any symptoms of myopia except dimness of vision for distance. However there are definite known signs of myopia such as reduced rigidity of sclera and weakness of accommodation as observed in different studies. Ruta has action on sclera and accommodation (ciliary muscles). So Ruta can be used as an organ remedy to give strength to the sclera and ciliary muscles to combat the daily ocular stress which children are constantly exposed during their competitive education. As an organ remedy it should be prescribed in lower potency and in repetition to patients as it has a brief duration of action. <sup>[11]</sup> Different myopia controlled studies has shown that local use of Atropine and to some extent Pirenzepine gel were effective in controlling myopia. It means that a local treatment helps to control myopia even though it is hereditary in nature. In a similar way a systemic administration of homoeopathic Ruta should be used to control myopia.

## SUMMARY

Progression of simple (childhood) myopia is a burning issue world over. Apart from heredity, excess of near work plays a major role in increased incidence & progression of myopia. Local use of modern medicines has helped to control myopia but they have got some limitations. Homoeopathic medicine Ruta has more similarity to myopia as compared to other medicines. So Ruta should be used as an organ remedy to control progression of myopia in children.

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Repertorisation: Normal

Remedy Name	Ruta	Phos	Agar	Calc	Nat-m	Sulph	Nit-ac	Puls	Euphr	Coa	Bell	Lyc	Swam	China
<b>Totality</b>	20	14	13	12	11	11	11	11	9	9	8	8	8	7
<b>Symptom Covered</b>	10	5	5	4	5	5	4	4	5	3	3	3	3	3
[BG] [Eyes]Eyes:	2	1	2	3	3	3		3	1		3	2		
[BG] [Eyes]Sclerotic:	1					1								
[KT] [Vision]Myopia:	2	3	2	2	2	2	3	2	2			2	2	2
[BN] [Vision]Myopia:	3	4	2	3	2	3	4	4	3	4		4	3	3
[BR] [Eyes]Vision:Myopia:	2	2	3				2		2		2			
[KT] [Eye]Looking:Into distance,agg:	1								1					
[BN] [Vision]Aggravation: Straining vision:	2				2									
[BN] [Vision]Illusions:Flies and muscae volitantes	3	4	4	4	2	2	3	1		3	3		3	2
[BR] [Eyes]Ciliary muscle:Accommodation disturb	2													
[KT] [Eye]Esophoria (see paralysis):	2													

Symptoms 10 Remedies 85