Original Article

Effect of Homoeopathic preparation of *Ruta graveolens* on the progression of childhood myopia before, during and after cessation of treatment: A retrospective study

Sandeep Sudhakar Sathye*

Department of Homoeopathy, Sathye Eye Research Institute for Alternative Medicines, Pune, Maharashtra, India

Abstract

Background: Increased incidence and progression of myopia, especially in Asian countries, have been attributed to excess near work. Topical use of *Atropine* was effective in controlling myopia but has got side effects and rebound effect after stopping the treatment. Homoeopathy mentions *Ruta graveolens* (*Ruta*) for myopia with its action on accommodation. **Aim:** The aim of the study is to evaluate the effect of *Ruta* on annual myopia progression rate (AMPR) before, during and after stopping treatment in childhood myopia. **Materials and Methods:** Ten cases of simple myopia in progressive stage aged 11–16 years were studied retrospectively. Myopia or spherical equivalent of refraction (SER) and AMPR in diopters (D) before treatment were assessed from the previous refraction reports. *Ruta* 3C was used in BD dose orally for 2 years with a gap of 7 days after every 21 days, and thereafter, treatment was discontinued. Subjective refraction on Snellen's chart at the start, during and after stopping treatment was recorded. From SER values, AMPR at different phases of study was assessed and analysed with paired *t*-test. **Results:** Mean AMPR before treatment was −1.10 D (±0.53). After *Ruta* treatment, there was a significant reduction of −0.27 D (±0.32) in AMPR ($t = -4.13$, $P = 0.003$). After stopping the treatment for an average of 10 months, mean AMPR was −0.46 D (±0.49), but this change was insignificant ($t = 1.21$, $P = 0.26$). **Conclusion:** Homoeopathic *Ruta* 3C was effective in controlling AMPR with no major progression after stopping the treatment.

Keywords: Annual myopia progression rate, Childhood myopia, Homoeopathy, *Ruta graveolens*

Introduction

Myopia is that diopteric condition of the eye, in which, with the accommodation at rest, incident parallel rays of light come to a focus anterior to light-sensitive layer of the retina.[1] It causes dimness of vision for distant objects as the only symptom noticed in majority of the patients. It is usually associated with an increase in axial length of the eyeball. Axial myopia is classified as simple and pathological myopia, of which simple (childhood) myopia is a common variety that commences between 5 and 13 years of age, progresses during the period of body growth with no major progression after 25 years of age.[2] When no progression occurs thereafter within a year, it is a stable myopia. Induced myopia is caused due to ocular inflammation, a debilitating disease and use of local or systemic pharmaceutical agents. It is transient in nature and regresses when the cause is removed, otherwise myopia regression does not occur in children. Worldwide, there is an increase in incidence and progression of myopia. Its prevalence is considerably higher in Asian populations than in Europeans[3] and is increasing at a rapid rate.[4] Heredity, excessive near work, reduced scleral rigidity, hormonal changes, systemic diseases, diet, etc., were postulated as its aetiological factors. Different studies have reported higher myopia progression rates with earlier age of onset of myopia, greater amount of time spent on near work, shorter reading distance and less time spent on outdoor activities.[5] Individuals with myopia, especially of higher grade, have to face different problems such as medical, occupational and economic. Higher the grade of myopia more are the chances of complications such as myopic

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***Address for correspondence:** Dr. Sandeep Sudhakar Sathye, Plot No. 4, Sadanand Nagar, Anand Nagar, Hingne Khurd, Sinhgad Road, Pune - 411 051, Maharashtra, India.
E-mail: sandeepsathye@gmail.com

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macular degeneration, retinal detachment and glaucoma which may cause blindness.[6] Many myopes are disqualified in service and its progression leads to financial burden due to frequent change of glasses. Hence, myopia not only creates a loss at personal level but also affects the economy and prosperity of the whole nation. Different measures used to control myopia include vision therapy techniques, use of optical devices and local use of modern medicines. In optical devices, controlled studies on use of bifocal and progressive spectacles for slowing progression of myopia had achieved a small treatment effect ranging from 0.15 to 0.50 D over 1.5–3 years.[7] However, treatment effect occurred in the initial period only. Myopia progression during the later period was at a similar rate as that of control. Effect of alteration of spectacle-wearing pattern on myopia progression has been evaluated in two studies. In one study, 43 myopics were categorised into four treatment groups as full-time spectacle wear, wear for distance viewing and then a switch to full-time wear, wear for distance viewing only and non-wear. Over a period of 3 years, no significant differences in refractive shifts between the treatment groups were noticed.[8] However, in other study, no significant differences in myopia progression in the different groups after 3 years in children were found who wear minus lenses with full correction for continuous use, wearing full correction for distance vision only and those using bifocal lenses.[9] However, use of under-correction on myopia in two studies has shown either an increase in the progression of myopia or no change as compared to fully corrected controls.[10] Of different pharmaceutical agents, topical use of *Atropine* 1% was found effective in controlling myopia. However, it was not approved as standard treatment due to side effects, ethical issues associated with its long-term use and rebound effect after discontinuation of treatment.[5] Hence, there is a great need of research to have an effective, safe, economical and easy to use medical treatment to control myopia.

In Homoeopathic literature, different medicines have been mentioned for myopia. Of these, *Ruta graveolens* (*Ruta*) seems to have more similarity to myopia associated with near work due to its effect on accommodation and sclera. Allen has specifically mentioned '*Ruta* is valuable in weakness of accommodation, especially in near-sighted people.'[11] He also quoted a drug-proving symptom in a myopic prover as 'He sees distant objects more distinctly than usual.'[12] Clarke has stated the 'use of *Ruta* in ailments from overstraining eyes, from reading too much, especially fine work at night.'[13] Boger mentions affinity of *Ruta* for eye in general and sclerotic portion of the eye in particular.[14] Reduced rigidity of sclera is one of the important factors in incidence and progression of myopia, especially of hereditary one. Moffat and Norton have mentioned '*Ruta* is more often indicated in weakness of Ciliary muscles than internal recti.'[15,16] Ciliary muscles are used in the process of accommodation during near work. Different animal studies have shown that they become myopic when exposed to continuous retinal defocus, similarly human studies have observed reduced accommodative response in myopes as compared to emmetropes.[17,18] Hence, *Ruta* was considered for this study. A controlled clinical study of *Ruta* on myopia was conducted and has shown its controlling effect on myopia.[19] However, its effect after stopping the treatment was not studied. Hence, this retrospective study was done with an aim to evaluate the effect of *Ruta* on Annual Myopia Progression Rate (AMPR) before, during and after stopping the treatment in childhood myopia.

Materials and Methods

Study design and settings

This was a retrospective case series study of diagnosed cases of simple myopia in their progressive stage enrolled during the year 2005–2007, in the OPD of Sathye Eye Research Institute for Alternative Medicines, Pune, Maharashtra, India.

Study population

Inclusion criteria

Ten diagnosed cases of simple myopia in their progressive stage were enrolled. Children suffering from simple myopia in their progressive stage with availability of their previous refraction reports, from 6 months to 3 years before starting the treatment, children taking education, age group between 7 and 16 years with myopia or spherical equivalent of refraction (SER) from 1.0 to 6.0 diopters (D) and corrected visual acuity up to 6/6 on Snellen's chart irrespective of gender, race and socioeconomic status, patients with normal ocular health other than myopia and in good general health with no history of cardiac or any major respiratory disease were included.

Exclusion criteria

- Individuals more than 16 years of age
- Individuals who had previous refraction reports of <6 months before starting the treatment.

Intervention

Ruta 3C was procured from a licensed homoeopathic pharmacy 'Shrikrishna Homeo Pharmacy' in Pune. It was given in a dose of four globules twice a day for the total duration of 2 years with a gap of 7 days after every 21 days. During treatment period, individuals were advised to use corrected glasses regularly, and no alteration in their diet and regimen was suggested.

Study procedure

Preliminary history of patients such as age, gender, amount of near-work activity in hours, their parental history of myopia and complaints were recorded from a case sheet. Patient's haemogram and urine routine investigation findings were noted which were carried out before starting the treatment to know the fitness of patients. From patient's previous refraction reports, refraction findings and their dates of examination were recorded. In eye examination, subjective refraction carried out on Snellen's chart and finalised after doing a Duochrome test was noted.[20]

After completion of 2 years of *Ruta* treatment, patient's blood (haemogram, serum creatinine, and serum glutamic-pyruvic transaminase [SGPT]) and urine investigation report findings were noted. After stopping the treatment, patients were advised to come for follow-up after 6 months to check their refraction and these findings were recorded.

Outcome measure

SER in diopters was an outcome measure that was assessed by subjective refraction. It is a spherical refraction plus half of cylindrical refraction.

Statistical analysis

Average of both eyes was used to evaluate the magnitude of change in refraction (SER), so the mean SER was calculated from right and left eye SER values. Mean change in SER before starting the treatment was calculated by subtracting SER value at the time of *Ruta* 3C intervention from SER value before starting the treatment for each participant by taking into consideration their previous older refraction report within last 3 years because from their refraction report of <6 months, we cannot judge properly their AMPR. From this change in SER value, AMPR in diopters (D) before starting the treatment was calculated by multiplying 12 months to mean change in SER value divided by number of months required to do this change in SER. It was calculated for each participant, and from AMPR values of 10 participants, an average rate was calculated. Mean change in SER during treatment was calculated by subtracting SER value after 2 years of treatment from SER at the start of treatment and then AMPR was calculated. In a similar way, change in SER after stopping the treatment was calculated by subtracting SER value after stopping the treatment for the average of 10 months from SER during 2 years of *Ruta* treatment. From this change in SER value and months of stopping the treatment, AMPR was assessed. Results on AMPR before, during and after stopping the treatment was analysed with a paired *t*-test and probability value (*P*) of <0.05 was considered statistically significant.

Results

A total of 19 patients who came for follow-up after cessation of *Ruta* treatment were assessed for eligibility. Out of these; four subjects were excluded due to following reasons: One subject was >16 years age, and in three subjects, refraction reports before starting treatment were of <6 months from their time of enrolment. Out of five subjects who were excluded after stopping *Ruta* treatment, two were shifted to constitutional homoeopathic treatment before 6 months due to moderate grade of myopia, while three subjects had follow-up after 18 months [Figure 1].

In the present study, a total of 10 subjects, 6 males and 4 females, were taken for analysis with a mean age of 12.9 years (±1.91). History of myopia in parents was noticed in seven children. They had a mean near-work activity of 4.9 h (±1.91). The mean myopia (SER) before starting the treatment was −2.52 D (±1.25), while at the start of treatment, it was −3.96 D (±1.21).

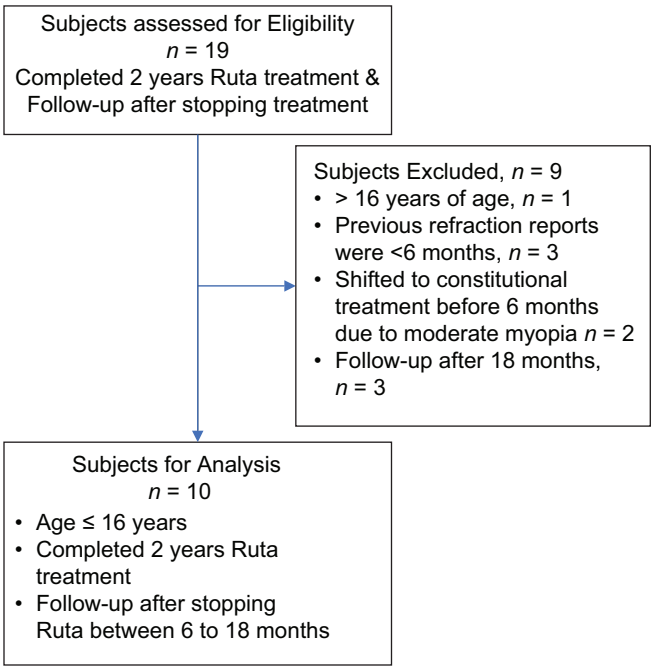

Figure 1: Flow chart showing reasons for exclusion of subjects in the study

The mean change in SER before starting treatment was −1.44 D (±0.57) that has occurred in average of 18 months (±7.86). Hence, the mean AMPR was −1.10 D (±0.53). After 24 months of *Ruta* treatment, the mean SER was −4.51 D (±1.60) and the mean change in SER was −0.54 D (±0.64). Hence, the mean AMPR was −0.27 D (±0.32). This marked reduction or difference in AMPR before and after *Ruta* treatment of −0.83 D was statistically significant ($P = 0.003$). Mean SER after stopping *Ruta* treatment was −4.96 D (±1.72), so the mean change in SER after stopping treatment was −0.46 D (±0.51) that has occurred in the average of 10 months (±3.59). The mean AMPR after stopping treatment was −0.46 D (±0.49). The difference in progression rate during and after stopping the treatment of 0.19 D was not found to be significant ($P = 0.26$).

Out of 10 subjects, AMPR in 7 was ≥−0.75 D before starting the treatment, whereas during *Ruta* treatment, AMPR was <−0.5 D in majority (8) of the subjects. After stopping the treatment, AMPR was ≤−0.5 D in majority (8) of subjects, and only in 2 subjects, it was > 0.5 D. Table 1 summarizes the myopia and AMPR in individual subject at different phases of study. Tables 2 and 3 depict the outcome of treatment on AMPR and Figure 2 shows the graph of mean AMPR before, during and after stopping the treatment. When the difference in AMPR before and after *Ruta* treatment was assessed, it was observed that in six subjects, there was a reduction in AMPR by >0.5 D after *Ruta* treatment.

During 2 years of *Ruta* treatment, no adverse effects related to *Ruta* 3C were observed in subjects. Similarly, blood and urine

Table 1: Myopia and annual myopia progression rate in individual subject at different phases of study

Age/ gender	Before treatment						During treatment			Stopping treatment			
	SER mean (D)	Myopic parents	Near work (h)	Myopia duration (months)	SER start treatment (D)	AMPR (D)	SER mean (D)	SER change 2 years (D)	AMPR (D)	Stopped treatment (months)	SER mean (D)	Change SER (D)	AMPR (D)
11/male	−1.00	Present	5	9.0	−2.50	−2.00	−3.00	−0.50	−0.25	8.0	−3.00	0.00	0.00
11/male	−4.00	Absent	5	7.0	−4.94	−1.60	−5.81	−0.88	−0.44	12.0	−6.25	−0.44	−0.44
13/female	−2.63	Absent	5	21.0	−5.25	−1.50	−6.13	−0.88	−0.44	8.0	−6.25	−0.12	−0.18
14/female	−0.32	Present	3	14.0	−2.07	−1.50	−1.50	0.57	0.28	6.0	−1.38	0.13	0.25
16/female	−3.13	Present	3	18.0	−4.88	−1.17	−5.38	−0.50	−0.25	7.0	−5.63	−0.25	−0.43
13/male	−2.25	Present	3	26.0	−4.13	−0.87	−5.75	−1.63	−0.81	9.0	−6.13	−0.38	−0.50
16/male	−4.25	Present	9	16.0	−5.25	−0.75	−5.13	0.13	0.06	17.0	−5.75	−0.63	−0.44
12/male	−3.38	Absent	7	19.0	−4.38	−0.63	−5.63	−1.25	−0.63	14.0	−6.75	−1.13	−0.96
11/male	−1.75	Present	4	16.0	−2.50	−0.56	−2.75	−0.25	−0.13	12.0	−4.25	−1.50	−1.50
12/male	−2.50	Present	5	34.0	−3.75	−0.44	−4.00	−0.25	−0.13	7.0	−4.25	−0.25	−0.43

SER: Spherical equivalent of refraction; AMPR: Annual myopia progression rate

Table 2: Outcome of annual myopia progression rate in diopters before and during *Ruta* treatment

Annual Myopia Progression Rate	Mean±SD		AMPR before and during treatment		
	AMPR before treatment (n=10)	AMPR during treatment (n=10)	Difference (95% CI)	t	P
AMPR (D)	−1.10±0.53	−0.27±0.32	−0.83 (−1.28-−0.38)	−4.13	0.003

SD: Standard deviation; AMPR: Annual myopia progression rate; CI: Confidence interval

Table 3: Outcome of annual myopia progression rate in diopters during and after stopping *Ruta* treatment

Annual Myopia Progression Rate	Mean±SD		AMPR during treatment and after stopping treatment		
	AMPR during treatment (n=10)	AMPR stopping treatment (n=10)	Difference (95% CI)	t	P
AMPR (D)	−0.27±0.32	−0.46±0.49	0.19 (−0.16-0.55)	1.21	0.26

SD: Standard deviation; AMPR: Annual myopia progression rate; CI: Confidence interval

investigation reports that were available for four subjects were found within normal limits.

Discussion

The results of this study show that use of *Ruta* 3C in BD dose for 2 years has reduced significantly the AMPR by −0.83 D as compared to the rate before starting the treatment without any untoward effects. This study also showed that even after stopping *Ruta* treatment myopia has progressed at much lower rate by 19.0 D/year even though it was not statistically significant. This shows that *Ruta* can be an effective treatment in controlling myopia and its effect persists even after stopping the treatment.

Ruta 3C has probably acted on ciliary muscles, thereby improving accommodation in myopes, leading to proper focusing of an image on the retina even during excessive near work. This might have resulted in slowing myopia progression. In animal model, retinal defocus developed by wearing negative lenses has resulted in the development of myopia. After stopping *Ruta* treatment, there was a slight increase in myopia, and probably, it is due to hereditary factor in background in these subjects that makes them susceptible for myopia progression when exposed to excessive near work. To tackle this problem, a constitutional line of treatment has to be planned after stopping *Ruta* treatment.

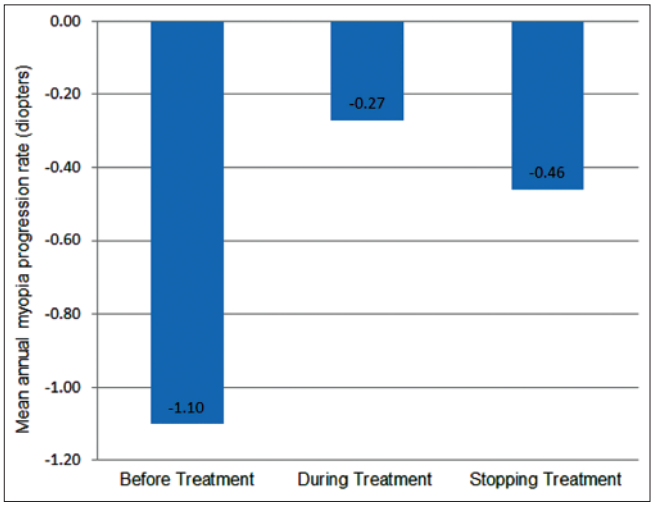

Figure 2: Mean annual myopia progression rate in diopters at different phases of study

AMPR is known to vary with age, use of corrective glasses, hours of near work, outdoor activity, parental myopia, overall nutrition levels, etc., In this study, all subjects were advised to use corrected glass on a regular basis and no alteration in diet and regimen (exercise) were suggested. Similarly, no children in this study were involved in outdoor (sports) activity. Thus, these factors play no role in affecting AMPR during *Ruta* treatment whereas amount of near work in hours and parental history of myopia were considered in this study as they decide the rate of myopia progression.

In this study, it was observed that in 6 out of 10 subjects, there was a reduction in AMPR by >0.5 D after *Ruta* treatment as compared to the rate before starting the treatment. This benefit was observed among all age groups, both gender and in children with parental myopia as well as no parental history of myopia. However, four subjects who were less benefitted by treatment were children of younger age group of ≤13 years and three had parental history of myopia. This shows that *Ruta* probably had less effect on myopia that usually starts at an early age which is usually governed by heredity.

In controlled clinical trials, topical use of *Atropine* 1% has shown a significant reduction in myopia progression after 2 years treatment. However, after cessation of treatment for 1 year, the mean progression in the *Atropine*-treated group was −1.14 ± 0.80 D, whereas in placebo-treated group, the mean progression was −0.38 ± 0.39 D.[21] However, in *Ruta* study after cessation of treatment, there was no rebound effect but a slow progression of myopia of −0.46 D/year which is much less as compared to *Atropine*. This shows that a oral route of administration of medicine is more useful in myopia control than topical use.

Minimum baseline level of myopia of −0.5 D and baseline set of associated factors such as measurement of axial length of eyeball in mm, power of accommodation in diopters and treatment duration of minimum 1 year should be considered in the study so as to justify the effect of pharmacological intervention in controlling myopia. Worldwide mean rate of myopia progression in children between 8 and 13 years of age is estimated as −0.5 D per year, whereas in Asian children, it is −0.8 D per year.[10] Hence, the minimum myopia progression rate of −0.5 D/year in Asian children can justify myopia control by therapeutic intervention, whereas myopia progression of <−0.5 D/year is considered as a pharmacological success in slowing down the progression of myopia.

Patient's haemogram and urine routine investigation findings that were carried out before starting the treatment as systemic infections, worm infestations, anaemia, etc., are common conditions in childhood that are known to cause a transient myopia or lead to an increase in existing myopia.[2] Hence, haemogram and urine routine examination were advised to all patients under the study. Similarly, after completion of 2 years *Ruta* treatment, patient's haemogram, serum creatinine, SGPT and urine routine investigation were advised to rule out any hepatic and renal toxicity of *Ruta*.

In this study, *Ruta* was used in low (3C) potency because of following reasons:

Myopia is associated with the changes in structure or shape of eye ball (increased axial length), so it is not a functional disease. Myopia is a disease localized to a single organ (eye) with only organ symptoms. Majority of the patients do not have any peculiar ocular symptoms except dimness of vision for distant objects. *Ruta* was prescribed for its action on particular part of the eye (ciliary muscles), and when a remedy is prescribed only for a particular effect, the potency that acts best is the one in lower range.[22] *Ruta* prescription was based on its local effect and not on any characteristic particular or general symptoms in myopic individuals so was used in lower potency. *Ruta* was prescribed by taking into account its particular effect on ciliary muscle (accommodation) and sclera so was used as an organ remedy. *Ruta* was prescribed with an intention to reduce daily ocular stress which the children are constantly exposed to, during their competitive education.

Strength of this study is that effect of *Ruta* in individuals suffering from simple progressive myopia has been evaluated completely by taking into account the AMPR before, during and after stopping the treatment. We should know the rate of myopia progression before starting the treatment in a myopic individual as there is much variation in the rate in Asian children than their western counterparts.[23] Similarly, myopia progression after cessation of treatment is also an important factor to study so as to know the long-term effect of treatment on myopia and also rebound effect after discontinuing the treatment. These parameters were not considered in majority of international myopia studies.

A small sample size, lack of refraction of eye at a regular intervals and no measurement of axial length after stopping *Ruta* treatment and no control group were the major limitations. Hence, a multicentric, randomized, double-blind, controlled clinical study in large sample and in different races and objective tests such as measurement of axial length, accommodation and sclera rigidity will reveal the mechanism of action of *Ruta* on myopia. Similarly, a future study after stopping *Ruta* treatment with 3 monthly examinations will help to know its long-term effects on myopia.

Conclusion

Ruta 3C in BD dose over 2 years was effective in controlling AMPR and its effect persisted even after stopping the treatment for the average of 10 months.

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Conflicts of interest

None declared.

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बचपन में होने वाले निकट दृष्टि (मायोपिया) के उपचार समाप्ति, उसके दौरान तथा बाद में होने वाली वृद्धि में होम्योपैथिक औषधि रुटा ग्रैवोलेंस का प्रभावः एक पूर्वव्यापी अध्ययन

सार

पृष्ठभूमिः दुनिया में, विशेष रुप से एशियाई देशों में निकट दृष्टि (मायोपिया) की बढ़ती घटनाओं और वृद्धि का श्रेय नजदीक से किये जाने वाले कार्यों की अधिकता को दिया गया है। निकट दृष्टि (मायोपिया) के नियंत्रण में आधुनिक औषधि एट्रोपिन का सामायिक प्रयोग प्रभावी था परंतु उपचार रोकने पर इसका दुष्प्रभाव और प्रतिक्षेप प्रभाव पड़ता है। होम्योपैथी में निकट दृष्टि (मायोपिया) के लिए रुटा ग्रैवोलेंस (रुटा) का उल्लेख एक्शन ऑन एकामडेशन के साथ किया जाता है।

उद्देश्यः अध्ययन का उद्देश्य बचपन में निकट दृष्टि (मायोपिया) उपचार रोकने के दौरान, उससे पहले और बाद में वार्षिक निकट दृष्टि (मायोपिया) वृद्धि दर (एएमपीआर) पर रुटा के प्रभाव का मूल्यांकन करना है।

सामग्री और विधिः 11 से 16 वर्ष की आयु वर्ग में प्रगतिशील चरण में सरल निकट दृष्टि के दस मामलों का पूर्वव्यापी अध्ययन किया गया। उपचार पूर्व निकट दृष्टि (मायोपिया), गोलाकार समकक्ष अपवर्तन (एसईआर) और डायोप्टर्स (डी) में एएमसीआर का पिछली अपवर्तन रिपोर्ट द्वारा मूल्यांकन किया गया। प्रत्येक 21 दिन बाद 7 दिनों के अंतराल के साथ दो वर्ष के लिए बीडी मौखिक खुराक में रुटा 3 सी का प्रयोग किया गया और इसके बाद, उपचार रोक दिया गया। उपचार आरंभ, उसके दौरान और रोके जाने पर, स्नेलेन चार्ट पर विषयक अपवर्तन दर्ज किया गया। एसईआर मूल्यों से, अध्ययन के विभिन्न चरणों में एएमपीआर का मूल्यांकन किया गया और पेयर टी–टेस्ट के साथ विश्लेषण किया गया।

परिणामः उपचार पूर्व औसत एएमपीआर 1.10 डी (0.53) था। रुटा द्वारा उपचार के बाद, एएमपीआर (टी= .4.13, पी= 0.003) में .0.27डी (0.32) की महत्वपूर्ण कमी देखी गई। 10 महीनों के औसत (3.59) के लिए उपचार रोकने के बाद, औसत एएमपीआर .0.46 डी (0.49) था, लेकिन यह परिवर्तन (टी= 1.21, पी= 0.26) नगण्य था।

निष्कर्षः उपचार रोक दिए जाने के बाद कोई बड़ी वृद्धि नहीं होने के साथ होम्योपैथिक औषधि रुटा 3 सी एएमपीआर को नियंत्रित करने में प्रभावी थी।

Wirkung des homöopathischen Mittels Ruta graveolens auf das Fortschreiten der Myopie bei Kindern vor, während und nach Ende der Behandlung: Eine retrospektive Studie

Hintergrund: Es ist ein weltweiter Anstieg, insbesondere in asiatischen Ländern, von Kurzsichtigkeit und eine erhöhte Inzidenz sowie Progression, die auf übermäßiges "Near Work" zurückzuführen ist, zu verzeichnen. Die topische Anwendung des modernen Arzneimittels Atropin war bei der Eindämmung der Kurzsichtigkeit wirksam, hat aber Nebenwirkungen und einen Rebound-Effekt nach dem Behandlungsende. In der Homöopathie wird Ruta graveolens (Ruta) bei Kurzsichtigkeit mit seiner Wirkung auf die Akkomodation erwähnt.

Ziel: Das Ziel der Studie ist es, die Wirkung von Ruta auf die jährliche Myopie-Progressionsrate (AMPR) vor, während und nach Beendigung der Behandlung bei Myopie in der Kindheit zu bewerten.

Material und Methoden: Zehn Fälle von einfacher Myopie im progressiven Stadium im Alter von 11 bis 16 Jahren wurden retrospektiv untersucht. Kurzsichtigkeit oder sphärisches Äquivalent der Refraktion (SER) und AMPR in Dioptrien (D) vor der Behandlung wurden aus den früheren Refraktionsberichten ausgewertet. Ruta C 3 wurde in "BD"-Dosen oral für zwei Jahre mit einem Abstand von 7 Tagen nach jeweils 21 Tagen verabreicht und danach wurde die Behandlung beendet. Die subjektive Refraktion auf Snellens Diagramm zu Beginn, während und nach Beendigung der Behandlung wurde aufgezeichnet. Aus den SER-Werten wurde AMPR in verschiedenen Studienphasen bewertet und mit gepaartem t-Test analysiert.

Ergebnisse: Die mittlere AMPR vor der Behandlung betrug -1,10 D (± 0,53). Nach der Ruta-Behandlung gab es eine signifikante Reduktion von -0,27 D (± 0,32) in AMPR (t = -4,13, P = 0,003). Nach einem durchschnittlichen Behandlungszeitraum von zehn Monaten (± 3,59) lag die mittlere AMPR bei -0,46 D (± 0,49), aber diese Änderung war nicht signifikant (t = 1,21, P = 0,26).

Fazit: Das homöopathische Arzneimittel Ruta C 3 zeigte seine Wirkung bei der Kontrolle von AMPR ohne wesentliche Progression nach Beendigung der Behandlung.

Efecto del preparado homeopático de *Ruta graveolens* en la progresión de la miopía infantil antes, durante y después de interrumpir el tratamiento. Estudio retrospectivo.

Resumen

Fundamentos: El incremento de la incidencia y progresión de la miopía en todo el mundo, sobre todo en los países asiáticos, se atribuye al trabajo a corta distancia. El uso tópico del medicamento moderno atropina ha sido eficaz en controlar la miopía, pero tiene efectos secundarios, así como efectos de rebote tras interrumpir el tratamiento. La homeopatía menciona *Ruta graveolens* (Ruta) para la miopía por su acción en la acomodación.

Objetivo: El objetivo del estudio es evaluar el efecto de Ruta en la tasa anual de progresión de la miopía (TAPM) antes, durante y después de interrumpir el tratamiento de la miopía infantil.

Materiales y métodos: Se estudiaron retrospectivamente diez casos (pacientes de 11 – 16 años) con miopía simple en estadio progresivo. A partir de los informes de refracción previos, se evaluaron la miopía o el equivalente esférico de refracción (ESR) y la TAPM en dioptrías (D) antes del tratamiento. Se administró Ruta 3C a una dosis oral de dos veces al día durante 2 años con un intervalo de 7 días tras cada 21 días, y después se interrumpió el tratamiento. Se registró la refracción subjetiva en el gráfico de Snellen al principio, durante y después de interrumpir el tratamiento. En las diferentes fases del estudio se evaluaron y analizaron los valores ESR y TAPM con la prueba t pareada.

Resultados: La TAPM media antes del tratamiento fue de −1,10 D (±0,53). Tras el tratamiento con *Ruta*, se produjo una reducción significativa de −0,27 D (± 0,32) en la TAPM ($t = -4,13$, $P = 0,003$). Tras interrumpir el tratamiento durante un promedio de 10 meses (± 3,59), la TAPM media fue de −0,46 D (± 0,49), pero este cambio no fue significativo ($t = 1,21$, $P = 0,26$).

Conclusiones: Ruta 3C homeopática fue eficaz en controlar la TAPM sin una progresión importante tras interrumpir el tratamiento.

Effets de la préparation homéopathique *Ruta graveolens* sur la progression de la myopie de l'enfant, avant, pendant et après l'arrêt du traitement : une étude rétrospective

Résumé

Contexte: Partout dans le monde, l'augmentation de l'incidence et de la progression de la myopie, en particulier dans les pays asiatiques, a été attribuée à l'excès du travail de près. L'utilisation de l'*atropine*, un médicament moderne à usage local, s'est avéré efficace pour contrôler la myopie mais a eu des effets secondaires et a provoqué un effet de rebond après l'arrêt du traitement. Les textes homéopathiques recommandent le *Ruta graveolens* (*Ruta*) comme remède pour la myopie grâce à son action sur l'adaptation.

Objectif: L'objectif de l'étude est d'évaluer l'effet du *Ruta* sur le taux annuel de progression de la myopie (TAPM) avant, pendant et après l'arrêt du traitement de la myopie de l'enfant.

Matériels et méthodes: Dix cas de myopie simple à des phases progressives chez des enfants âgés de 11 à 16 ans ont été étudiés de manière rétrospective. La myopie ou l'équivalence sphérique de la réfraction (ESR) et le TAPM en dioptries (D) avant le traitement ont été évalués en utilisant des rapports de réfraction précédents. Le *Ruta* 3C a été administré oralement deux fois par jour pendant 2 ans avec un arrêt de 7 jours tous les 21 jours. Le traitement a ensuite été arrêté. La réfraction subjective a été mesurée sur le tableau de Snellen au début, pendant et après l'arrêt du traitement. Partant des valeurs ESR, le TAPM a été évalué et analysé à différentes phases de l'étude à l'aide de tests t jumelés.

Résultats: le TAPM moyen avant le traitement était de −1.10 D (±0,53). Après le traitement avec le *Ruta*, une réduction importante de −0,27 D (±0,32) a été constatée dans les valeurs du TAPM (t = −4,13, P = 0,003). Pendant une durée moyenne de 10 mois (±3,59) après l'arrêt du traitement, le TAPM moyen était de −0,46 D (±0,49), mais ce changement était négligeable (t = 1,21, P = 0,26).

Conclusion: le médicament homéopathique *Ruta* 3C était efficace dans le contrôle du TAPM et aucune progression majeure n'a été constatée après l'arrêt du traitement.

順勢療法製劑芸香治療之前、期間和停止治療後對兒童近視的影響：一項回顧性研究印度順勢療法研究雜誌

摘要

背景：在全世界，特別是在亞洲國家中，近視發病率和近視加深的情況歸因於過度近距離工作。局部使用現代醫藥阿托品 (Atropine) 後可有效控制近視，但有副作用和停藥之後會有反彈作用。順勢療法提到芸香 (Ruta) 在近視上有調節作用。目的：研究的目的是在芸香治療之前、期間和停止之後，以每年近視進展率 (AMPR) 來評估其治療兒童近視的作用。材料及方法：對10個10～16歲患有單純性近視的個案進行回顧性分析。在治療之前，會先評估以前折射報告中近視或球面當量折射 (SER) 和AMPR，以屈光度 (D) 為單位。每日兩劑芸香3C，口服2年，每21日之後停7日，之後終止治療。在治療的開始、期間和之後都會記錄斯涅倫圖表的主觀反應。從SER值，AMPR會在研究的不同階段被評估，並以配對t檢定進行分析。結果：治療前，AMPR的平均數是 1.10 D （±0.53）。使用芸香治療後，AMPR顯著下降至 0.27 D（±0.32）（t = 4.13, P = 0.003）。在平均停止治療後的10個月（±3.59），AMPR的平均數是 0.46 D（±0.49），這變化並不顯著（t = 1.21，P = 0.2）。結論：順勢療法的芸香3C可有效控制AMPR，停藥後也無明顯惡化。