Efficacy of Akshitarpana and Pana of Mahatriphaladi Ghrita in the Management of Timira (Simple Myopia) - An Open Labelled Randomized Comparative Clinical Trial

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Abstract

Background: Acharya Sushruta has mentioned Timira as a Drishtigata Roga affecting the Patala. Timira is considered as a disease affecting the Drishti which left untreated causes Drishtinasha. When Apathya Ahara-Vihara has been continued for a long period, it leads to Khavaigunya and vitiated Dosha takes place in the Prathama Patala; can complain of “Avyakta Darshana” which can be correlated with complain of difficulty in seeing far object or all the external objects appears dim and hazy to the sight. When it occurs in the Dwitiya Patala, there are complaints of “Vihwala Darshana” can be correlated with confused visual perception and seeing false image. According to the dominancy of Dosha among all the vitiated Doshas when reach to the Prathama and Dwitiya Patala; it causes Vataja-Pittaja-Kaphaja-Raktaja-Sannipataja Timira accordingly. Rupa of Doshika Timira occurs according to vitiated Dosha in Sansthan. According to Acharya Sushruta, Prathama Patalagata Timira is Sadhya (curable) and Dwitiya Patalagata Timira is Krichchhasadhya (curable with difficulty).

In modern science, Timira can be co-related with clinical findings of Simple Myopia. Also called physiological myopia. simple myopia is the commonest variety. Various surveys in India have found myopia prevalence ranging from 6.9% to 19.7%. Corrective lenses are just providing an aid to diminished vision.

Aim: To assess the efficacy of Akshitarpana and Pana of Mahatriphaladi Ghrita in the management of Timira (Simple Myopia).

Material and Methods: Total 40 patients on the basis of signs and symptoms of the disease Timira (Simple Myopia) were registered and were randomly allocated into two groups adopting computerised randomisation technique as follows with Group A (n = 20): Pana and Akshitarpana with Mahatriphaladi Ghrita and Group B (n = 20): Akshitarpana with Mahatriphaladi Ghrita.

Results: Group A shows better percentage of relief in Durastha Avyakta Darshana i.e., 70.31% in comparison to Group B i.e., 32%. Group A shows better percentage of relief in Vihwala Darshana i.e., 76.92% in comparison to Group B i.e., 33.33%. Group A shows 83.31% relief in Shiroabhitapa and 90%
relief in Netrasrava in compare to Group B. The comparative data was statistically insignificant (p > 0.05) in chief complain while statistically significant (p < 0.05) in associated complain.

**Conclusion:** Mahatriphaladi Ghrita Pana along with Mahatriphaladi Ghrita Akshitarpana is more effective than Mahatriphaladi Ghrita Akshitarpana alone in Simple Myopia.

**Keywords:** Timira, Mahatriphladi Ghrita, Simple Myopia

**Introduction**

Eye is the most specialized sense organ serving the most vital function providing sight to living creature Good. Vision is crucial for social and intellectual development. Acharya Sushruta has clearly mentioned that prevention of eye diseases should be the utmost aim rather than its curative aspect and if neglected or improperly treated, these diseases may ultimately lead to the total loss of vision.

Acharya Sushruta discoursed on the chapter seven - Drishtigata Roga Vijnaniya which deals with the Rupa, Samprapti, Pathya-Apathya, Chikitsa of the diseases which are peculiar to the Drishti of the eye. Among them the present study deals with the details of the disease named as Timira affecting the Patala. Timira is considered as a disease affecting the Drishti which left untreated causes Drishtinasha. When Apathya Ahara-Vihara has been continued for a long period, it leads to Khavaigunya and vitiated Dosha takes place in the Prathama Patala can complain of “Avyakta Darshana” which can be correlated with complain of difficulty in seeing far object or all the external objects appears dim and hazy to the sight. When it occurs in the Dwitiya Patala, there are complaints of “Vihwala Darshana” can be correlated with confused visual perception and seeing false image of Makshika (fly), Mashakana (insect), Keshana (hair), Jalani (web), Mandalani (circles), Pataka (flag), Mariachi (mirage), Pariplavacha can be correlated with seeing unexciting objects and floaters. Acharya Vagbhatta added other complaints are “Bhutam Tu Yatnata Aasnna” and “Dure Sukshuma Cha Na Ikshate” in the Dwitiya Patala can be correlated with difficulty for near and distance vision. According to the dominancy of Dosha among all the vitiated Doshas when reach to the Prathama and Dwitiya Patala; it causes Vataja-Pittaja-Kaphaja-Sannipataja Timira accordingly. Rupa of Doshika Timira occurs according to vitiated Dosha in Sansthan.

According to Acharya Sushruta, Prathama Patalagata Timira is Sadhya (curable) and Dwitiya Patalagata Timira is Kr ichchhasadhya (curable with difficulty). Local as well as systemic management of the disease Timira is necessary evident from the Chikitsa Sutra described in classics. In Timira, therapies such as Snehana, Raktamokshana, Pana, Nasya, M urdha Basti, Basti kriya, Tarpana, Anjana, Bidalaka, Lepa is advocated to be given according to Dosha involved.

According to clinical features of Prathana and Dwitiya Patalagata Timira, in Modern science can be correlated with clinical findings simple myopia. Also called physiological myopia. It is dioptric condition of the eye in which with the accommodation at the rest incident parallel rays come to a focus anterior to the light sensitive layer of retina. Among the four varieties classified clinically, simple myopia is the commonest variety. Various surveys in India have found myopia prevalence ranging from 6.9% to 19.7%. Simple Myopia has been implicated as the 6th leading cause of vision impairment. In Asia, prevalence of simple myopia is higher ranging 40% in general population and 80% in students. As regards to prognosis low or
moderate degree of simple myopia are not likely to progress. Only widely used corrective lenses are just providing an aid to diminished vision. Surgical measures are carried out if required other than the glasses or contact lenses which has its own risks and complications apart from being expensive.

- **Aim:** To assess the efficacy of *Akshitarpana* and *Pana* of *Mahatriphaladi Ghrita* in the management of *Timira* (Simple Myopia).
- **Objective:** To assess the efficacy of *Mahatriphaladi Ghrita Pana* and *Akshitarpana* in the management of *Timira* (Simple Myopia).

**Materials and Methods**

Institutional Ethics Committee (IEC) approval was taken prior to initiation of research. No any adverse drug reaction has been recorded during the course of the trial. Study was registered in Clinical Trial Registry of India CTRI/2020/11/029217. Patient information sheet was prepared and the patient informed consent was taken before starting the treatment.

Total 40 patients of *Timira* (Simple Myopia) were registered from outpatient department and inpatient department of Shalakya Tantra, IPGT&RA, Jamnagar. They were randomly allocated into two groups adopting computerised randomisation technique as follows:

**Group A (n = 20):** Pana and Akshitarpana with Mahatriphaladi Ghrita.

**Group B (n = 20):** Akshitarpana with Mahatriphaladi Ghrita

The patients were given treatment for a period of 30 days. After completion of the treatment, the patients were followed up for 1 month at the interval of 15 days.

Raw herbal drug of *Mahatriphaladi Ghrita* was procured from Pharmacy, Gujarat Ayurved University, Jamnagar and authenticated in Pharmacognosy laboratory, IPGT and RA, Gujarat Ayurved University, Jamnagar. Then the medicines were prepared adopting the standard API methods *Ghrita*.

**Criteria of Selection**

**Inclusion Criteria**

- Patient within the age group of 10-25 years with normal fundus were included in the study.
- Patients having signs and symptoms of *Timira* (Simple Myopia) described as per *Ayurveda* and Modern science.
- Myopia up to -6D were included in the study.

**Exclusion Criteria**

- Patient below age of 10 years and above 25 years.
- Patient having any other known ocular pathology.
- Patient having myopia more than -6D.
- Patient having myopic degenerative changes.
Investigations
Haematological examinations (Hb%, TC, DLC, ESR), Urine analysis (Physical, Chemical and Microscopic) and Biochemical-RBS has been carried out before treatment to rule out any systemic disease. Lipid profile analysis (S. Cholesterol, S. Triglycerides, S. HDL, S. LDL, S. VLDL) has been carried out before treatment to rule out any systemic disease and after treatment to note any changes in these parameters.

Criteria for Assessment
Assessment was done on the basis of scoring pattern applied for subjective and objective parameters both before and after treatment.

Subjective Criteria
Symptoms of Simple myopia i.e.
- Vihwala Darshana (Blurred Vision)
- Durastha Avyakta Darshana (Diminished Distant Vision)
- Netrasrava (Watery Discharge)
- Shiroabhitapa (Headache)

Objective Criteria
Routine Examination and investigations:
- Visual Acuity with Snellen’s Chart
- Direct and Indirect Ophthalmoscopy
- Wet Retinoscopy (if required)
- Keratometry
- A-Scan

The details of the score adopted for the main signs and symptoms in this study are as follows:

<table>
<thead>
<tr>
<th>Durastha Avyakta Darshana: (Diminished Distant Vision)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No feeling of Diminished distant vision</td>
<td>0</td>
</tr>
<tr>
<td>Occasional Diminished distant vision</td>
<td>1</td>
</tr>
<tr>
<td>Regular Diminished distant vision without disturbing routine work</td>
<td>2</td>
</tr>
<tr>
<td>Regular Diminished distant vision disturbing day to day work</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vihwala Darshana: (Blurred Vision)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No such problem</td>
<td>0</td>
</tr>
<tr>
<td>Occasional blurring or disturbance of vision</td>
<td>1</td>
</tr>
<tr>
<td>Regular blurring without disturbing routine work</td>
<td>2</td>
</tr>
<tr>
<td>Regular blurring disturbing day to day work</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Netrasrava: (Watery Discharge)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No watery discharge</td>
<td>0</td>
</tr>
</tbody>
</table>
Objective Criteria

<table>
<thead>
<tr>
<th>Mild watery discharge</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate watery discharge</td>
<td>2</td>
</tr>
<tr>
<td>Severe watery discharge</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shirobhitap (Headache)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No headache</td>
<td>0</td>
</tr>
<tr>
<td>Very occasional headache</td>
<td>1</td>
</tr>
<tr>
<td>Irregular attacks of frequent headache</td>
<td>2</td>
</tr>
<tr>
<td>Regular headache</td>
<td>3</td>
</tr>
</tbody>
</table>

**Statistical Analysis**

The data obtained in clinical study were subjected to statistical analysis by evaluating the significance of the interventions using paired and unpaired t tests. After obtaining the P value, it was observed as insignificant P > 0.05, significant P < 0.05, highly significant was P < 0.01.

**Observation**

Among all the participants in this clinical trial 80% had complaints of Durastha Avyakta Darshana (Indistinct distant vision) and 47.5% had complaints of Vihwala Darshana (Blurred vision), 50% had complaints of Shiroabhitap (Headache) and 47.5% had complains of Netrasrava (Eye discharge).

**Results**

In the present study total 40 patients were registered, 20 in group A and 20 in Group B, and all of them completed the course of study. The effect of therapy in 40 patients of OSMF is presented below.
Effect of Therapies on Chief Complaints

Subjective Parameters

Chief Complaints
In Group A, mean score of *Durasta Avyakta Darshana* was reduced from 1.58 to 0.47 with percentage of relief 70.31% which was statistically highly significant (p < 0.001). While, mean score of *Vihwala Darshana* was reduced from 1.083 to 0.250 with percentage of relief 70.31% which was statistically highly significant (p < 0.001).

In Group B, mean score of *Durasta Avyakta Darshana* was reduced from 1.60 to 1.13 with percentage of relief 32% which was statistically significant (p < 0.001). While, mean score of *Vihwala Darshana* was reduced from 1.70 to 1.33 with percentage of relief 33.33% which was statistically significant (p < 0.001).

Associated Complaints
In Group A, mean score of *Shiroabhitapa* was reduced from 1.08 to 0.18 with percentage of relief 83.31% which was statistically highly significant (p < 0.001). While, mean score of *Netrasrava* was reduced from 1.00 to 0.00 with percentage of relief 90% which was statistically highly significant (p < 0.001).

In Group B, mean score of *Shiroabhitapa* was reduced from 1.0 to 0.63 with percentage of relief 36.36% which was statistically significant (p < 0.05). While, mean score of *Netrasrava* was reduced from 1.0 to 0.30 with percentage of relief 58.33% which was highly statistically significant (p < 0.001).

Objective Parameters

Visual Acuity
In Group A, mean score of Right Eye Visual Acuity was reduced from 4.30 to 3.45 with percentage of relief 19.76% which was statistically highly significant (p < 0.001). While, mean score of Left Eye Visual Acuity was reduced from 4.450 to 3.45 with percentage of relief 22.47% which was statistically highly significant (p < 0.001).

In Group B, mean score of Right Eye Visual Acuity was reduced from 4.90 to 4.45 with percentage of relief 8.33% which was statistically highly significant (p < 0.001). While, mean score of Left Eye Visual Acuity was reduced from 4.90 to 4.45 with percentage of relief 9.18% which was statistically highly significant (p < 0.001).

Refraction
In Group A, mean score of dioptric power of spherical lens in Right eye was reduced from 1.71 to 1.40 with percentage of relief 17.36% which was statistically highly significant (p < 0.001). While, mean score of dioptric power of spherical lens in Left Eye was reduced from 1.66 to 1.37 with percentage of relief 16.52% which was statistically highly significant (p < 0.001).

In Group B, mean score of dioptric power of spherical lens in Right eye was reduced from 1.76 to 1.55 with percentage of relief 12.05% which was statistically significant (p < 0.005). While, mean score of dioptric power of spherical lens in Left Eye was reduced from 2.06 to 1.76 with percentage of relief 12.05% which was statistically significant (p < 0.05).
Keratometry
In Group A, keratometry in right eye K1 and K2 has no mean difference with percentage of relief 0.025% and left eye K1 was reduced from 43.92 to 41.89 with percentage of relief 5.14% and in K2 was reduced from 44.03 to 43.98 with percentage of relief 0.13%. Both eye K1 and K2 results were statistically insignificant in Group A.

In Group B, keratometry in right eye K1 and K2 has no mean difference with 0% of relief while in left eye K1 has mean difference of -0.05 i.e., 0.13% percentage of relief and in K2 mean difference of -0.02 i.e., 0.06% percentage of relief. No Keratometry change was found in Group B. Both eye K1 and K2 results were statistically insignificant in Group B.

Axial Length
In Group A, Axial length of right eye mean score reduced from 23.420 to 23.395 with percentage relief 0.116% and in left eye mean score reduced from 23.482 to 23.470 with percentage relief 0.059% were found. Both eye Axial length results were statistically insignificant in Group A.

In Group B, Axial length of right eye mean score reduced from 23.561 to 23.59 with percentage relief 0.004% and in left eye mean score reduced from 23.572 to 23.57 with percentage relief 0.002% were found. Both eye Axial length results were statistically insignificant in Group B.

Table 1: Comparative Effect of Therapy on Chief Symptoms of Timira (Simple Myopia)

<table>
<thead>
<tr>
<th>Chief Complaints (B/L Eye)</th>
<th>Group</th>
<th>N</th>
<th>Mean Diff.</th>
<th>S.D. ±</th>
<th>S.E. ±</th>
<th>‘t’</th>
<th>‘P’</th>
<th>Sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durastha Avyakta Darshana</td>
<td>A</td>
<td>17</td>
<td>1.118</td>
<td>0.600</td>
<td>0.146</td>
<td>0.0616</td>
<td>&gt; 0.05</td>
<td>IS</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>15</td>
<td>1.133</td>
<td>0.834</td>
<td>0.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vihwala Darshana</td>
<td>A</td>
<td>11</td>
<td>0.909</td>
<td>0.302</td>
<td>0.090</td>
<td>1.511</td>
<td>&gt; 0.05</td>
<td>IS</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>08</td>
<td>0.625</td>
<td>0.518</td>
<td>0.183</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Group A shows better percentage of relief in Durastha Avyakta Darshana i.e., 70.31% in comparison to Group B i.e., 32%. Group A shows better percentage of relief in Vihwala Darshana i.e., 76.92% in comparison to Group B i.e., 33.33%.

The data reveals that Group A showed better percentage of relief in comparison to Group B in all symptoms of the disease Timira (Simple Myopia) but comparison between both the groups shows statically insignificant result (p > 0.05).

Table 2: Comparative Effect of Therapy on Associated Complaints of Timira (Simple Myopia)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiroabhitapa</td>
<td>A</td>
<td>10</td>
<td>1</td>
<td>0.47</td>
<td>0.14</td>
<td>2.714</td>
<td>&lt; 0.05</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>10</td>
<td>0.40</td>
<td>0.51</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Group A shows 83.31% relief in Shiroabhitapa and 36.36% in Group B. Group A shows 90% relief in Netrasrava and 58.33% in Group B. The data reveals that Group A showed better percentage of relief in comparison to Group B in all above symptoms of the disease Timira (Simple Myopia) but comparative data between both the groups shows statically significant result (p < 0.05).

Table 3: Comparative Effect of Therapy on Visual Acuity in Timira (Simple Myopia)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Eye</th>
<th>Group</th>
<th>N</th>
<th>M.D.</th>
<th>S.D. ±</th>
<th>S.E. ±</th>
<th>‘t’</th>
<th>P</th>
<th>Sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Acuity</td>
<td>RE</td>
<td>A</td>
<td>20</td>
<td>0.850</td>
<td>0.366</td>
<td>0.081</td>
<td>2.869</td>
<td>&lt; 0.05</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>20</td>
<td>0.400</td>
<td>0.598</td>
<td>0.134</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LE</td>
<td>A</td>
<td>20</td>
<td>1</td>
<td>0.459</td>
<td>0.103</td>
<td>3.584</td>
<td>&lt; 0.001</td>
<td>HS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>20</td>
<td>0.450</td>
<td>0.510</td>
<td>0.114</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Group A shows better percentage of improvement in Left Eye in compare to Right Visual Acuity i.e., 22.471% in left eye and 19.76% in right eye in comparison to Group B i.e., 9.183% in left eye and 8.33% in right eye. The comparative data is statistically highly significant (p < 0.001) in Left eye and statistically significant in right eye (p < 0.05).

Table 4: Comparative Effect of Therapy on Visual Refraction in Timira (Simple Myopia)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Eye</th>
<th>Group</th>
<th>N</th>
<th>M.D.</th>
<th>S.D. ±</th>
<th>S.E. ±</th>
<th>‘t’</th>
<th>P</th>
<th>Sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Refraction</td>
<td>RE</td>
<td>A</td>
<td>20</td>
<td>0.30</td>
<td>0.21</td>
<td>0.04</td>
<td>1.20</td>
<td>&lt; 0.05</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>20</td>
<td>0.21</td>
<td>0.28</td>
<td>0.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LE</td>
<td>A</td>
<td>20</td>
<td>0.28</td>
<td>0.18</td>
<td>0.041</td>
<td>0.98</td>
<td>&lt; 0.05</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>20</td>
<td>0.21</td>
<td>0.28</td>
<td>0.063</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In Group A, dioptric power of spherical lens was reduced better percentage in Right and Left Eye Visual Refraction i.e., 17.36% in right eye and 16.52% in left eye in comparison to Group B i.e., 12.056% in both right and left eye. The comparative data is statistically significant (p < 0.05) in all these parameters.

Table 5: Overall Effect of Therapy

<table>
<thead>
<tr>
<th>Assessment of Result</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Patients</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>Cured</td>
<td>15</td>
<td>75%</td>
</tr>
<tr>
<td>Marked Improvement</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Moderate Improvement</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Mild Improvement</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Unchanged</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>-----------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

In Group A, 75% of patient’s patient got complete remission, 20% of patients got moderate improvement, 5% patients remained unchanged. While no patients got marked improvement.

In Group B, 20% of patient’s patient got complete remission, 10% of patients got marked improvement, 25% of patients got moderate improvement, 20% of patients got mild improvement and 25% patients remained unchanged.

No any adverse effect found in the present study till the follow-up period.

**Discussion**

**Probable Mode of Action of Mahatriphaladi Ghrita Akshitarpana**

*Akshitarpana* (ocular therapy) is one of the local therapeutic procedures aimed to give nourishment to the eye through Medicated *Ghrita, Ghritmanda, Vasa, Majja* etc. which made stagnant in the eye for a specular time period in a particular formed frame which if promptly used reveal an objective piece of evidence of excellent responses are already been mentioned by *Acharyas*.

*Akshitarpana* acts as a prophylactic and curative therapy for maintaining the natural acuity and condition of eyes. It has *Brimhana* quality. It cherishes the eyes, improves and invigorates the *Drishti Shakti*. It is preventive and remedial procedure in *Vataja* and *Pitta Vikara*.

The drugs used in *Akshitarpana* procedure is the combination of *Ghrita* and medicines, hence the drug can easily cross the corneal epithelium (being lipophilic) and endothelium (being hydrophilic). Also due to more contact time the active component of drug used in *Akshitarpana* will be absorbed more and may leads to cure the diseases by providing proper nourishment to the structures.

In *Ayurveda*, *Mahatriphaladi Ghrita* described as *Rasayana* having *Sheeta Virya* and *Balya, Brimhana* property to protect body from various diseases. The *Ghrita* has trespassing into minutest channels of the body and enters into deeper layer of *Dhatus* through *Rupavaha Siras* and purifies every minutest part of channels while pacifying *Pitta dosha*. So, it is highly effective in *Drishtigata Roga* having dominancy of *Alochaka Pitta*. 
Flowchart of Probable Mode of Action of *Mahatriphaladi Ghrita Akshitarpana*

- Administration of *Mahatriphaladi Ghrita Akshitarpana*
  - Absorption of drugs into Epithelium endothelium of cornea by lipophilic nature of *Ghrita*
  - Absorption through cornea independent of molecular size
  - Enhanced absorption of the drug and by exerting direct pressure upon the cornea, ant. Lens Capsule, ciliary muscle and to other tissues
  - May leads to changes in the refractive index and corneal curvature on getting proper nourishment

- Through *Rupavaha Siras* Spread of the drug in to deeper tissues (By *Sthanik Mridu Swedana* and *Sukhosha* lipotropic in quality of *Ghrita*)
  - *Mahatriphaladi Ghrita - Balya, Chaksushya, Rasayana* properties
  - Activation of *Alochaka Pitta*
  - Increased *Bala of Drishti Nadi* (Optic nerve) + Visual centre in Brain activation

- Overall Improvement of Visual Acuity by decreasing all the sign and symptoms of *Timira* (Simple Myopia)

**Probable Mode of Action of *Mahatriphaladi Ghrita Pana***

In the present study, the selected formulation - *Mahatriphaladi Ghrita* must have the *Guna* (Properties - Molecular structure) to break down the *Samprapti* (Pathogenesis) of the *Roga* - *Timira*. The *Samprapti* of *Timira* is not sufficient enough according to *Samhitas*. In Ayurveda, the *Rasapanchaka* plays an important role to know any drug in detail. On the basis of *Rasapanchaka*, the probable mode of the action of the *Mahatriphaladi Ghrita* is as follows - The drug is having *Madhura*, *Amla*, *Katu*, *Tikta* and *Kashaya* Rasas, *Snigdha*, *Guru*, and *Mridu* Guans, *Sheeta* (Mainly) and *Ushna Veerya*, *Madhura Vipaka*.in the *Samprapti* of Timira it is having *Tridosha Prakopa*, were major constituents of *Mahatriphaladi Ghrita* has *Tridoshashamak* property.

Due to *Ama Utpatti*, which causes *Rupavaha Sira Srotorodha* – can be break down by drugs of *Mahatriphaladi Ghrita* having *Deepana* - *Pachana Gunas* and by *Chhedana Guna* of *Tikta rasa* with respect to *Tikshna Guna* of *Katu Rasa* in *Marga Vivarana*. *Ushna Veerya* has *Rasayana*, *Shodhana*, *Chaksushya* and *Kapha- Vatashamaka* effect which gives *Bala* to *Alochaka Pitta* responsible for visual perception while *Sheeta Veerya* of other drugs maintains the *Sheeta Satmya* of the *Drishti*. *Madhura Rasa* and *Madhura Vipaka* of *Mahatriphaladi Ghrita* drug have *Jeevaniya*, *Rasayana*, *Chaksushya* properties, a prime source of nourishment of *Dhatus* of the *Patalas* and *Drishti*, thus by enlightening *Netra-Sharir*. *Mahatriphaladi Ghrita* has *Sheeta Veerya* and *Madhura* in *Vipaka*. At last, *Samprapti - Ghataka* achieved by *Tridosha Shamaka*.
Karma of Mahatriphaladi Ghrita which ultimately helpful in Vata Pradhan Tridosaja Vikar – Timira. Apart from these properties, all the content of Mahatriphaladi Ghrita has Balya, Chaksushya, Rasayana, and Brimhana which will strengthen the Drishti and Patala of Netra for better vision.

Flow Chart of Probable Mode of Action of Mahatriphaladi Ghrita Pana

- Tridosha Shamaka by Sheeta Veerya, Madhura rasa and Madhura Vipaka
- Increase Agni by Laghu Guna, Tikta Rasa and Deepana-Pachana property
- Jathraagni Vriddhi
- Aama Pachana
- Absorption of drugs through Annavaha Srotas-Tridosha Shamaka
- Distribution of drugs through Rasa and Raktavaha Siras and Srotas
- Rasa, Rakta Dhatvaagni Vriddhi
- Rakta Prasadana of Akshi
- Rasa
- Rasa
- Chaksushya, Jeevaniya, Brihanam, Balya which leads to Vatashamaka
- Decreases Avyakta Darshana and Vihwala Darshana of Akshi
- Improvement in sign and symptoms of Timira

Conclusion
After analysis of all the data, it can be concluded that group A shows statistically significant result than that of group B that was Oral administration of Mahatriphaladi Ghrita along with Akshitarpana is more effective.
as that of *Mahatriphaladi Ghrita Akshitarpana* alone in the management of *Timira* (Simple Myopia). The duration of the treatment is short; so, further long-duration studies are needed. It is recommended that the study should be carried out on a large number of patients with longer duration to evaluate and analyse the efficacy of drugs.

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Conflicts of Interest
There is no conflict of interest.

Consort flowchart of this study is described in Figure 1.
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