Accommodative Facility in Myopes and Non-Myopes at Mechi Netralaya (Eye Hospital) at

Jhapa District, Eastern Nepal

Mechi Netralaya & Ophthalmic Research Centre

Mechinagar-6, Kakarvitta, Jhapa, Province no.1, Nepal

September 2019

Summary

Objective:
Many studies have shown that the myopes have abnormal accommodative characteristics. This study aimed at measuring the accommodative facility of myopes and non-myopes and compare between them.

Method:

Distance and near accommodative facility in cycles per minute(cpm) were measured using ±2 D flippers. 100 patients (50 myopes and 50 non-myopes) aged between 15-25 years were taken as the research participants visited in OPD of Mechi Netralaya and Ophthalmic Research Centre, of Mechinagar-6, Jhapa. Only the right eye data was considered for the analysis. Difference between the groups were analyzed with the ANOVA (Brown-Forsythe F Test).

Findings:

This Mean distance facility was significantly lower (5.3 ± 2.8 cpm) in the myopic group compared with the mean distance facility in the non-myopic group (8.7 ± 3.1 cpm). Mean near facility was also significantly lower (4.3 ± 1.8 cpm) in the myopic group compared with the mean near facility in the non-myopic group (6.6 ± 2.4 cpm). But, both distance and near Accommodative facility was not significantly different among the age groups. The area under the receiver operating characteristics (ROC curve) for distance facility was 0.784 (P <0.001, 95% CI, 0.696–0.87), suggesting that distance cpm had only a fair ability to discriminate between myopic and non-myopic eyes. Hence, the accommodative facility cannot be used as a stand-alone discriminatory test to predict myopia.

Conclusions:

There was no any difference in the accommodative facility between age group. Myopic eyes have reduced accommodation facility at both distance and near. However, accommodative facility as a test does not have sufficient power to distinguish eyes with myopes and non-myopes of age between 15-25 years.

Acronyms

cpm	Cycle Per Minute
LOM	Late Onset Myopia
OPD	Out Patient Department
ROC	Receiver Operating Characteristic
SER	Spherical Equivalent Refractive error
NHRC	Nepal Health Research Council

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CHAPTER 1. INTRODUCTION

1.1 Background

Myopia has emerged as a major health issue in world, the prevalence of myopia has increased rapidly in the past few decades. People with Myopia can see close objects clearly, but objects farther away appear blurred; have difficulty clearly seeing a movie or television screen or the whiteboard in school.

Accommodation is the ability of the eye to change the refractive power of the lens to automatically focus on objects at various distances. There is a classic statement of a difference in form of the ciliary muscle in myopic eyes, which can be taken as the starting point for a discussion of differences in accommodation.(1) The association between sustained near work requiring high levels of ocular accommodation and the development of myopia has been well documented(2,3,5), which conforms the increased accommodative effort required during near work as a causative factor in the development of myopia.

However, the relationship between accommodative demand and myopia is complex, because there is invariably a link between the hereditary basis of myopia and environmental factors. Although there is no consensus regarding the basis for development of myopia, there is increasing awareness that prolonged and frequent close work is associated with the type of myopia that emerges relatively late in life (>15 years). This type of refractive error is classified as late-onset myopia (LOM), which is generally assumed to be environmental in origin rather than caused by hereditary influences.(3)

Variations in the accommodation response have also been reported between refractive groups under static closed-loop conditions. For example, myopic children have been shown to accommodate significantly less to real targets than emmetropic children and there is growing evidence from these studies to suggest that errors of accommodation are associated with myopia.(4)

Ability of the eye/s to focus on stimuli at various distances and in different sequences in a given period of time is called accommodative facility. Facility of accommodation measures the speed of accommodative responsiveness (ability to alter accommodation rapidly and accurately) to blur, using alternating negative–plano or negative–positive lenses to induce and relax accommodation.(5)

In a study where the facility of accommodation in young adults with myopia was measured and found the mean distance facility to be significantly lower in the myopic than in the emmetropic subjects. It is reported that although the test was not sufficiently discriminating between subjects with and without myopia, it held promise as a predictive test(6).

Heredity and environmental factors such as near work activity, outdoor activities, school achievement, history of ocular disease, nutrition, residence, parental education, types of school, night lightness and ocular hygiene are the contributing factors of myopia.(7)

In Nepal, the prevalence of myopia ranged from 10.9%, 16.5% and 27.3% in 10, 12 and 15 years old respectively in urban region whereas <3% in 5-15 years children living in rural regions [6]. A recent study done in school children, shows prevalence of myopia in urban is 15.5% and rural is 8.2 %.(8)

There is an endemic of myopia in Asia. The prevalence rate of myopia has been in climbing ratio. In some part of Asia the prevalence of myopia is about 70-90 %.(9) Different studies suggest different factors associated with myopia. Genetic factors play more substantial role in the development of early-onset myopia. The children studying in private schools were twice as likely to have myopia as compared to those studying in government schools.(10)

The studies to suggest that errors of accommodation are associated with myopia.(11) Studies also found the mean distance facility to be significantly lower in the myopic than in the emmetropic subjects.(5,12)

Accommodation is a complex constellation of sensory, neuromuscular and biophysical phenomena by which the overall refracting power of the eye changes rapidly to image objects at different viewing distances clearly on to the retina.(13)

The accommodative responses of early-onset myopes, late-onset myopes, emmetropes and hyperopes were measured over a range of 5 Dioptres using an objective infra-red autorefractor. Differences were found between the four refractive groups, with hyperopes accommodating more for near targets than emmetropes, followed by early-onset myopes then late-onset myopes. Moreover a strong correlation between the accommodative response gradient and refractive error was found, suggesting that hyperopes accommodate more to a particular target than do emmetropes or myopes.(3)

Children are more vulnerable group for developing myopia due to increase in near work activity, continuous reading etc. Children are more focused in indoor activities such as watching television, playing video games, spending more time in computer than outdoor activities. It is still controversial that whether the myopia results from heredity factors or environmental influences such as reading, close work, accommodation, diet etc. The aim of this study was to identify the accommodative facility among myopes and non-myopes.

1.2 Rationale

The study of the characteristics of myopic eye and non-myopic eyes and its association with the accommodation can help in developing causal model of accommodative facility in etio-pathogenesis of refractive errors. Hence, this study aims to help in building science in the field of characteristics of accommodative facility in myopic and non-myopic eyes.

1.3 Objectives

1.3.1 General Objective
To measure and compare accommodative facility between myopes and non-myopes.

1.3.2 Specific Objective
a) To measure accommodative facility in myopes.
b) To measure accommodative facility in non-myopes
c) To determine whether accommodative facility can be used to predict an association with myopia.

1.4 Research Question

a) What is the difference in accommodative facility among myopes and non-myopes?
b) Can we use accommodative facility to predict the myopia?

1.5 Study Variables

For this study, study variables were categorized into dependent and independent variables.

a) **Dependent Variables**
Dependent variables consisted variables like Accommodative Facility at Distance and at Near
b) **Independent Variables**
Independent Variables consisted variables like Age, Gender, Refractive error.

1.6 Conceptual Framework

Accommodative facility is ability of the eye/s to focus on stimuli at various distances and in different sequences in a given period of time. Clinically, this is measured either monocularly or binocularly, usually by having the subject fixate a small target alternately through plus and minus lenses, which are interchanged as soon as the target appears clear.

The operation is repeated many times and the results are commonly presented in cycles per minute (one cycle indicates that both plus and minus lenses have been cleared) Following conceptual framework has been developed for this study with extensive literature review:

Independent Variables		Dependent Variables

Socio-demographic
- Age
- Gender

Refractive errors

Accommodative facility
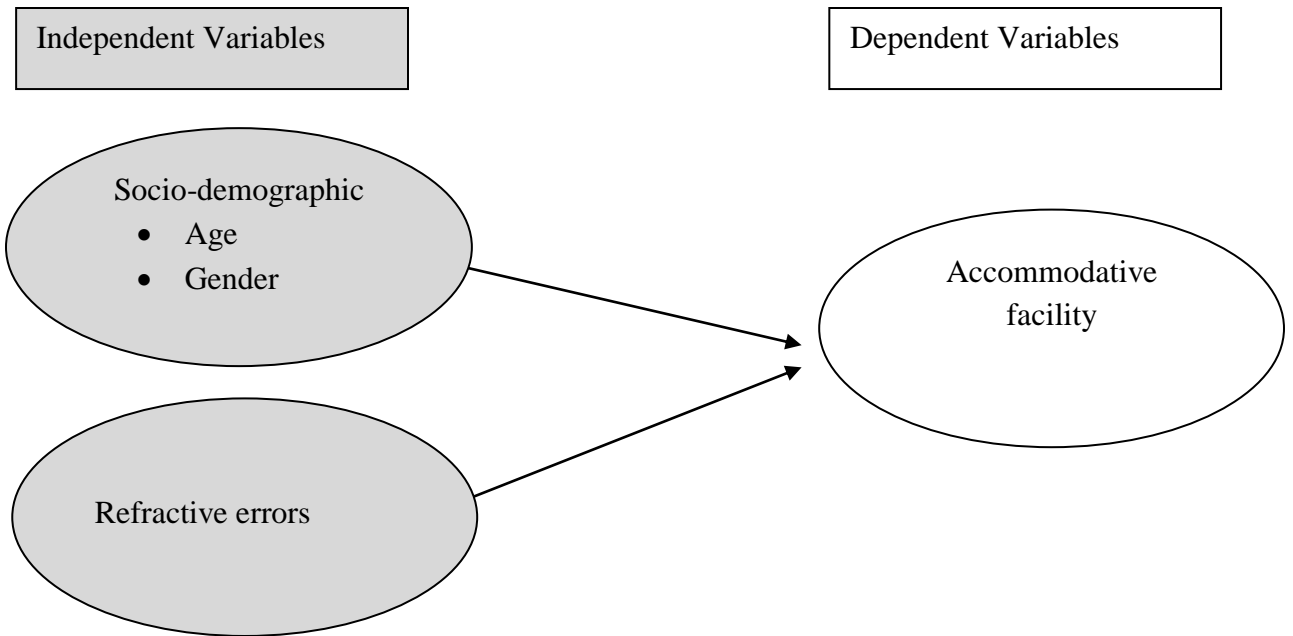
Figure 1-1: Conceptual Framework of the Study

CHAPTER 2. METHODOLOGY

2.1 Study Design

The study design is based on Correlation Quantitative Research Design.

2.2 Study Method

The study method is Quantitative Research Method.

2.3 Study Site

The Study was conducted on Out Patient Department (OPD) of Mechi Netralaya & Ophthalmic Research Center (P) Ltd, Kakarvitta, Mechinagar 6, Jhapa, Nepal. It is a reputed eye hospital with substantial number of patients visiting the OPD daily with various visual disturbances. Geographically it is located near to boarder area between Nepal and India, providing services to patients from India as well.

Figure 2-1: Mechi Netralaya and Ophthalmic Research Centre Location Map

2.4 Study Population

Patients between age group of 15 to 25 years, either male or female having problem of Myopia and Non Myopia attending OPD of Mechi Netralaya (Eye Hospital) were selected as the study population. Patients visited to OPD in between the time period 2019, July 1st to August 2nd week.

2.5 Sampling Technique

The sampling technique adopted for the study was non-probability and purposive sampling.
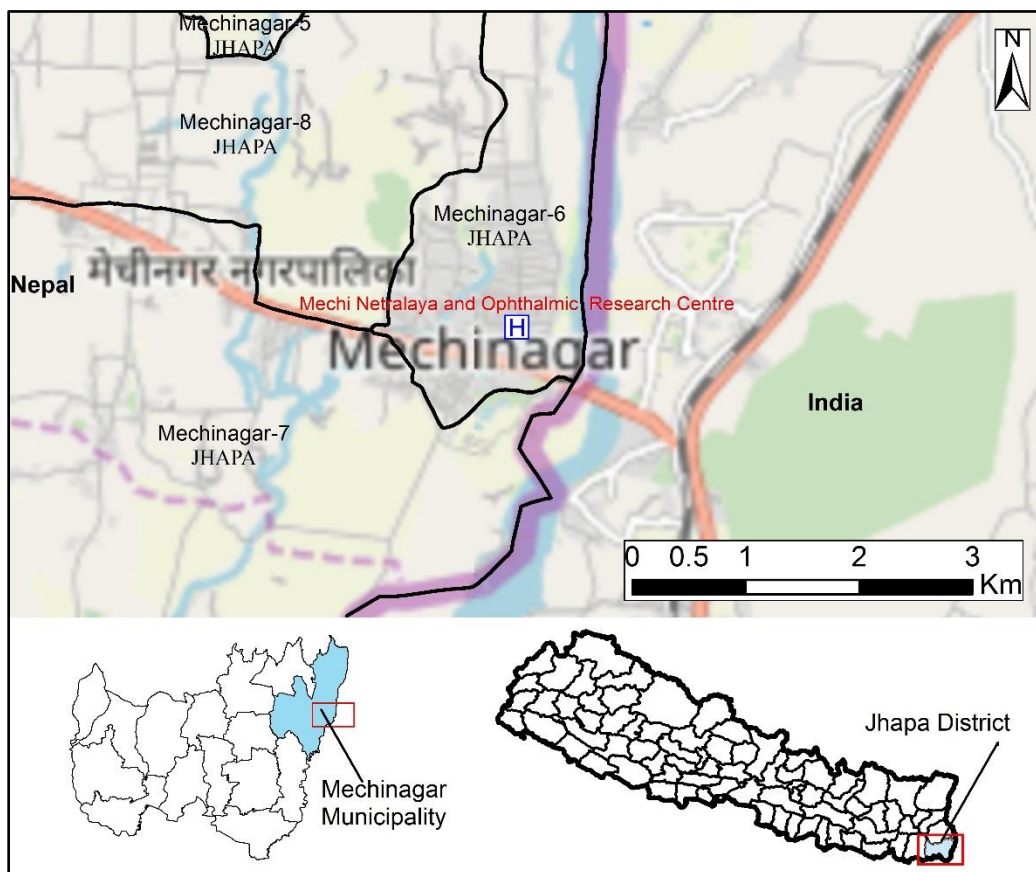
2.6 Sample Method and Size

Sample size of the study was 100 patients of age group of 15 to 25 either male or female. Most of the younger aged group patients have Myopia as their refractive errors. Many of young patients visiting the hospital OPD have normal vision. Hence, the sample size for this study in accessing the accommodative facility in myopes and non-myopes individuals was achieved without difficulty.

2.7 Criteria for Sample Selection

Selection of cases were considered based on following criteria:

Age group 15 – 25 years

Based on Spherical Equivalent Refractive error (SER)

      1st category Emmetropia <0.5 D and < -0.5 D

      2nd category Hypermetropia ≥ +0.5 D and < 1.5 D

      3rd category Myopia ≥ -0.5 D and < -1.5 D

Only right eye data was considered.

All samples should have corrected visual acuity of 6/6, Pupil Diameter < 5mm

Astigmatism less than ± 1.00D,

2.8 Tools and Techniques for Data collection

The study was a Comparative Observational Study. Tools used for data collection were: Accommodative Flippers, Snellen Chart, Snellen reduce near vision chart.

2.9 Data Collection

The face-to face interview was conducted by the surveyor to the respondents of the study. To evaluate the ability of the eye to alter accommodation rapidly and accurately, accommodative

facility testing is often incorporated as a part of an ocular examination. The patient was given a hand-held flipper containing a pair of +2.00D lenses on one side and −2.00D lenses on the other side and is instructed to clear a row of reduced Snellen print at 0.4 m through one pair of lenses and to flip to the other pair as soon as the print is readable.

Monocular accommodative facility for the right eye was investigated at both 6 meter and 0.4 meter. Accommodative facility in distance was measured with a plano/ -2.00D lens combination mounted in a flipper with subject viewing 6/9 letters placed 6 meter away whereas at near reduced 6/9 letters were viewed through a flipper consisting of a +2.00D/-2.00D lens combination.

A pair of positive and negative flips is considered as one cycle, and the number of cycles completed in a minute is recorded by the practitioner. This clinical standard for accommodative facility testing was described by Zellers et al.(14)

The pilot test was carried out in the same hospital which was not sampled for the survey. Specific Optometrist was allotted for the data collection and research team member supervised the procedure of data collection.

2.10 Data Management and analysis

Completeness and return rate was calculated from the completed questionnaire on the same day of the survey in the hospital. Data was then exported from Excel to SPSS V23 for analysis purpose. Data was analyzed using descriptive statistics involving frequency and percentage and bi-variate analysis was done to identify the influencing factors and relationships. Difference between the groups were analyzed with the ANOVA (Brown-Forsythe F Test). After a significant result, multiple comparisons were performed with the Games-Howell adjustment. The level of statistical significance was maintained at $P < 0.05$.

2.11 Exclusion and inclusion Criteria

Those patients with refractive error between age 15-25 years was only included in the study. Patient with myopic retinal degeneration, Amblyopia or any ocular disease were excluded.

2.12 Validity and reliability

The questionnaire was designed with the extensive literature review and the expert's opinions. Trained optometrist ran the ocular examination for the accommodative facility measurements. Research team member supervised the data collection and test procedures.

2.13 Ethical Considerations

1. Ethical approval was taken from Nepal Health Research Council (NHRC) as per the guidelines (Annex 1).

2. Approval was taken from the hospital authority before data collection (Annex 2).

3. Verbal and written consent was obtained from all participants and parent of minor age group (Annex 3 and Annex 4).

4. The purpose of the study was clearly shared with each respondent.

5. Confidentiality was maintained on the personal issues and information of the respondents.

6. Voluntary participation was ensured.

2.14 Limitation of the study

Monocular accommodative response was measured in the study. The study population were between the age group of 15-25 hence, respondent's bias may occur due to the high literacy and memory power of the study participants while assessing the accommodative response time. The study sampled only the patient visiting to OPD of Mechi Netralaya and Ophthalmic Research Centre.

CHAPTER 3. FINDINGS

This chapter shows the major findings from the study. Data from 50 myopic and 50 non-myopic patients were collected. The chapter is divided into 3 sections namely: a) section for socio demographic characteristics of the population sampled, b) Accommodative facility at Distance and c) Accommodative facility at Near.

3.1 Socio demographic Characteristics

The study was conducted with the data of 50 myopes and 50 non-myopes. The mean age of the response was 20.69 ± 3.76 years. Socio-demographic background of participants in the study is summarized in the Table 3-1:

Table 3-1: Socio-demographic Characteristics of research participants(n=100)

Variables	Classifications	Frequency(%)
Gender	Male	40(40)
	Female	60(60)
Age Group (In years)	15-18	32(32)
	19-22	28(28)
	23-25	40(40)
Education	School	28(28)
	Intermediate	37(37)
	Bachelors	24(24)
	Masters	11(11)

The study participant comprises 40 male and 60 female participants of age group 15 to 25. Majority of the research participants are from the age ranging from 23 to 25(40%). Regarding the educational qualification 28% had completed school level education, 37 % intermediate, 24 % Bachelors and 11 % completed masters.

The study assessed the refractive error of only the right eyes of the participants. Of the 100 right eyes, 50(50%) were myopic and 47(47%) emmetropic and 3(3%) hyperopic. The findings are shown in Table 3-2.

Table 3-2: Categories of Refractive errors (n=100)

Variables	Classifications	Frequency(%)
Non-myopes	Emmetropia	47(47)
	Hypermetropia	3(3)
Myopes	Myopia	50(50)

3.2 Accommodative facility at Distance

The mean distance facility for the total study population was 7.0 ± 3.38 cpm. The mean distance facility for myopic eyes was 5.3 ± 2.8 cpm, whereas non-myopic eyes were 8.7 ± 3.1(Emmetropic 8.8 ± 3.2 cpm and hypermetropic 7.3 ± 1.2 cpm). Similarly, age group of 15-18 years recorded 7.0 ± 3.5 cpm, 19-22 years' age group 6.4 ± 3.3 cpm and 23-25 years age group 7.4 ± 3.3 cpm at distance (Table 3-3).

Table 3-3: Distance Facility

Refractive status		Mean ± SD	Range	F	P Value
Refractive errors	Emmetropia	8.8 ± 3.2	3-15	16.454	<0.001
	Hypermetropia	7.3 ± 1.2	6-8		
	Myopia	5.3 ± 2.8	0-12		
	Total	7.0 ± 3.38	0-15		
Myopia and Non-Myopia	Myopes	5.3 ± 2.8	0-12	32.3	<0.001
	Non Myopes	8.7 ± 3.1	3-15		
Age Group	15-18 years	7.0 ± 3.5	0-14	0.73	0.48
	19-22 Years	6.4 ± 3.3	1-15		
	23-25 Years	7.4 ± 3.3	2-13		
Gender	Male	7.86 ± 3.58	0-14	4.47	0.037
	Female	6.42 ± 3.15	1.5-15		

The difference in the mean accommodative facility at distance between myopic eyes and non-myopic eyes were found significantly different. There was a significant difference between the groups (F = 16.454, P< 0.001), with myopic eyes recording a significantly lower number of cpm than emmetropic and hyperopic eyes. There were no differences between emmetropic and hyperopic eyes ($P = 0.284$). The study found that age group (F = 0.73., P= 0.48) of the adult patients was not significantly associated with the mean accommodative facility at distance. Similarly, mean cpm at distance was found to be significantly different between the gender of the patient (F = 4.47, P= 0.037), where male patients have lower mean cpm than that of female patients group.

Data were further analyzed to determine whether it is possible to distinguish between myopic and non-myopic eyes by using distance facility. The sensitivity and specificity for the distance cycles per minute were calculated along with the area under the Receiver Operating Characteristic (ROC) curve. The area was 0.784 (P<0.001, 95% CI, 0.696–0.873), suggesting that distance cpm had a fair ability to discriminate between myopic and non-myopic eyes.

Predictive values plus sensitivity and specificity were computed for three categories of distance cycles per minute, to determine whether distance cycles per minute can be used as a predictive measure (Table 3-4). The highest negative predictive value for myopia was distance cpm ≥ 7.5 (74.4%, sensitivity 64.0%). Of the positive predictive values, the most predictive was for cpm ≤ 5.5 (78.1%, sensitivity 50.0%).
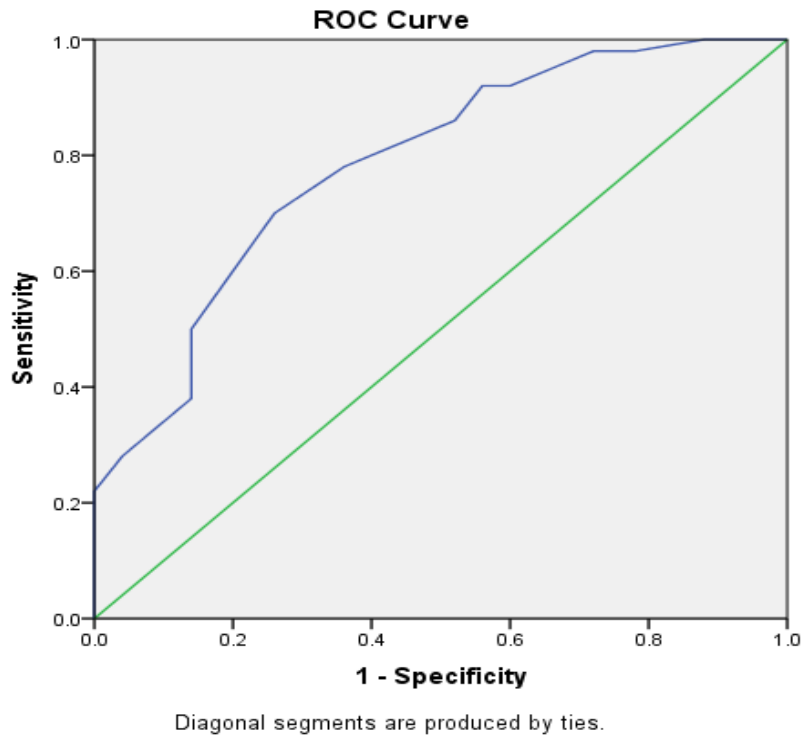

Figure 3-1: ROC Curve

Table 3-4: Distance Facilities for Predicting Myopia

Distance Facility	Myopes	Non-Myopes
≤ 5.5 cpm		
Frequency	25	7
% within cpm	78.1%	21.9%
% within refractive error group	50.0%	14.0%
6-7 cpm		
Frequency	14	11
% within cpm	56.0%	44.0%
% within refractive error group	28.0%	22.0%
≥ 7.5 cpm		
Frequency	11	32
% within cpm	25.6%	74.4%
% within refractive error group	22.0%	64.0%

3.3 Accommodative facility at Near

The mean near facility for the total study population was 6.6 ± 2.5 cpm. The mean near facility for myopic eyes was 4.3 ± 1.8 cpm, whereas, non-myopic eyes was 6.6 ± 2.4 (Emmetropic 6.6 ± 2.5 cpm and hypermetropic 6.3 ± 1.5 cpm). Similarly, for near facility age group of 15-18 years recorded 5.5 ± 2.3 cpm, 19-22 years age group 4.7 ± 1.9 cpm and 23-25 years age group 5.9 ± 2.8 cpm (Table 3-5).

Table 3-5: Near facility

Refractive status		Mean ± SD	Range	F	P Value
Refractive errors	Emmetropia	6.6 ± 2.5	3-14	14.92	<0.001
	Hypermetropia	6.3 ± 1.5	5-8		
	Myopia	4.3 ± 1.8	1-9		
	Total	5.4 ± 2.4	1-14		
Myopia and Non-Myopia	Myopes	4.3 ± 1.8	1-9	30.09	<0.001
	Non Myopes	6.6 ± 2.4	3-14		
Age Group	15-18 years	5.5 ± 2.3	1-9	2.09	0.128
	19-22 Years	4.7 ± 1.9	1-8		
	23-25 Years	5.9 ± 2.8	2-14		
Gender	Male	5.52 ± 2.46	1-14	0.113	0.737
	Female	5.35 ± 2.39	1-14		

As with distance facility, there was significant difference between the refractive error groups in the mean near facility (F=14.924, P<0.001) with myopic eyes recording a significantly lower number of cpm than emmetropic and hyperopic eyes. There were no differences between emmetropic and hyperopic eyes (P = 0.273), Age group (F=2.09, P=0.128) and gender (F=0.113, P=0.737) were found to be not associated with the near cpm.

CHAPTER 4. DISCUSSION

The chapter discusses the findings of this study and compares the result with findings of other similar studies.

The mean distance accommodative response for all our study participants in our study 7.0 ± 3.38 cpm is similar to other studies (12,15). Myopic eyes had mean distance accommodative response 5.3 ± 2.8 cpm whereas, non-myopic eyes had mean distance accommodative response 8.7 ± 3.1 cpm. Our findings showed that the accommodative facility at distance is significantly different between myopic eyes and non-myopic eyes. The depression in Accommodative facility at distance in myopic eye than the non-myopic is highly significant statistically. O'Leary and Allen reported adult myopes to have lower accommodative monocular distance facilities (9.7 ± 6.3 cpm) in comparison to adult emmetropes (15.6 ± 6.8 cpm)(5). Similar finding has been recorded in other similar studies done in Australia(12) and other parts of the globe(11).

But the study of Pandian et. al.(12) reports no difference in the near accommodative facility between myopic eyes and non-myopic eyes of children, but our result shows that there is statistically difference in mean near accommodative facility between myopic eyes and non-myopic eyes.

Previous reports have confirmed an increasing trend in accommodative facility with age, particularly during the early years of schooling. But our study resulted no significant difference between the mean accommodative facility at distance and near. This may be due to the difference in age group of our study population who are between 15 to 25 age group. Studies have confirmed that accommodation appears to stabilize as children progress into adulthood(15), hence in our study too there seems no difference in the accommodative facility within the age group in adulthood.

In this study, we also sought to determine whether distance facility could be used as a test to discriminate between myopic and non-myopic eyes, which was also assessed by Pandian et. al. in their study(12) so that we can support their findings in determining the refractive error with the help of accommodative facility test . The test is rapid and can be used in patient easily. And similar to the findings of Pandian et. al., ROC values in our study also suggest that accommodative facility cannot be used as a stand-alone discriminatory test for myopia.

Although distance cpm ≥ 7.5 was highly predictive (74.4%) and sensitive for non-myopia (64.0). This finding means that using distance cpm ≥ 7.5 to discriminate between myopic and non-myopic eyes could result in many false positives in the population. A more useful measure may be to track eyes for development or progression of myopia. Distance cpm ≤ 5.5 was seen to be most predictive of myopia (78.1%), and therefore it may be beneficial to track eyes in this group for development or progression of myopia. Similar findings was recorded in the study of Pandian(12) regarding the negative predictive value for myopia was distance cpm > 7 (99.4%, sensitivity 85.0%).

CHAPTER 5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Myopic eyes showed significantly lower rate of accommodative facility at both distance and near than the non-myopic eyes in same age group of 15 to 25 years. We also sought to determine if distance facility could be used as a test to discriminate between myopic and non-myopic eyes. However, our ROC value suggested that the accommodative facility cannot be used as a stand-alone discriminatory test for myopia. Due to the cross-sectional nature of the study, the role played by the accommodative dysfunction in the development of refractive errors is not clear. A variety of factors may play role in developing the kind of refractive errors.

5.2 Recommendation

Further study should to explore relation between patient behavior and environment setting and accommodative facilities to different refractive error. Large scale prospective study on the topic should be carried out to develop more strong causal relationship between accommodation and myopia.

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Annex

Annex 1: Ethical Approval From NHRC

Government of Nepal

Nepal Health Research Council (NHRC)
Estd. 1991

Ref. No.: 3221

14 June 2019

Mr. Chandra Narayan Rajbanshi
Principal Investigator
Mechi Netralaya Opthalmic and Research Centre
Jhapa

Ref: **Approval of research proposal** entitled **The comparative study on accomodative facility in myopes and non-myopes, at Mechi Netralaya (Eye Hospital), Mechinagar 6, Jhapa, Nepal**

Dear Mr. Rajbanshi,

It is my pleasure to inform you that the above-mentioned proposal submitted on **24 May 2019** (**Reg. no. 333/2019**) please use this Reg. No. during further correspondence) has been approved by Nepal Health Research Council (NHRC) Ethical Review Board on **12 June 2019**.

As per NHRC rules and regulations, the investigator has to strictly follow the protocol stipulated in the proposal. Any change in objective(s), problem statement, research question or hypothesis, methodology, implementation procedure, data management and budget that may be necessary in course of the implementation of the research proposal can only be made so and implemented after prior approval from this council. Thus, it is compulsory to submit the detail of such changes intended or desired with justification prior to actual change in the protocol. Expiration date of this proposal is **December 2019.**

If the researcher requires transfer of the bio samples to other countries, the investigator should apply to the NHRC for the permission. The researchers will not be allowed to ship any raw/crude human biomaterial outside the country; only extracted and amplified samples can be taken to labs outside of Nepal for further study, as per the protocol submitted and approved by the NHRC. The remaining samples of the lab should be destroyed as per standard operating procedure, the process documented, and the NHRC informed.

Further, the researchers are directed to strictly abide by the National Ethical Guidelines published by NHRC during the implementation of their project proposal and **submit progress report in between and full or summary report upon completion.**

As per your research proposal, the total research amount is **Rs 1,50,500** and accordingly the processing fee amounts to **Rs 5,000.** It is acknowledged that the above-mentioned processing fee has been received at NHRC.

If you have any questions, please contact the Ethical Review M & E Section at NHRC.

Thanking you,

Prof. Dr. Anjani Kumar Jha
Executive Chairperson

MECHI NETRALAYA

&

Ophthalmic Research Center P. Ltd.

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मिति: ०४/०३/२०७६

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मेची नेत्रालय एण्ड अपथाल्मिक रिसर्च सेन्टर
वडा नं. ६, मेची नगर नगरपालिका, झापा

विषय: अध्ययन अनुसन्धान अनुमति सम्बन्धमा

महोदय,

प्रस्तुत विषयमा यस अस्पतालमा अध्ययन गर्ने विषयको क्षेत्र अन्तरगतमा सामेल गर्नु भएकोमा धन्यवाद दिन चाहन्छौं । तपाईहरुले पेश गर्नु भएको प्रस्तावना अध्ययन गर्दा, अध्ययनको विषय "The Comparative study on Accomodative Facility in Myopes and Non-Myopes at Mechi Netralaya (Eye Hospital)" मा अस्पतालको Myopes and Non myopes बिरामीहरुको Accomodative Facility मा तुलनात्मक अध्ययन गरिने कुरामा हामी पनि विश्वस्त भएका छौं । यस अध्ययनमा लागु हुने अध्ययन विधिले यस अस्पतालको कुनै पनि मानमर्यादामा र अस्पतालको कार्यमा असर नपर्ने भएकोले यस अध्ययनको लागि तपाईलाई मेची नेत्रालय एण्ड अपथाल्मिक रिसर्च सेन्टरले सहृदय स्वागत साथै अनुमति प्रदान गर्दै आवश्यक सहयोग गर्ने प्रतिबद्धता व्यक्त गर्दछौं ।

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मञ्जुरीनामा

म ……………………………… आफ्नो स्वइच्छाले यस मेची नेत्रालय आँखा अस्पतालमा हुनेवाला Accomodative Facility In Myopes and Non-Myopes सम्बन्धि अध्ययन अनुसन्धानमा सहभागी हुनका लागि राजी छु । म यस अनुसन्धानको विधि, फाइदा, असर, गोपनीयता र भविष्यमा यसको प्रयोजन बारेमा सम्पूर्ण रुपमा जानकारी राख्छु र यसबाट मलाई कुनै आपत्ति छैन । यस अनुसन्धानमा सहभागी हुनका लागि मलाई कुनै प्रकारको शुल्क या सुविधा दिइएको छैन । यदि अध्ययनको बीचमा आफू सङ्लग्न हुन नचाहेमा म माथि कुनै प्रकारको अवरोध ⁄ दबाव दिइने छैन । यदि कुनै किसिमको जिज्ञासा अथवा केहि सोध्न मन भए सोध्न पाउने छु ।

<u>अनुसन्धानकर्ता</u>   सहभागी

                                              नाम :

                                              हस्ताक्षर :

                                              ठेगाना :

                                              मिति :

                                              औठाछ्याप

दाहिने   देब्रे

<u>सहमति पत्र</u>

यस मेची नेत्रालय तथा अफ्थाल्मिक रिर्सच सेन्टरले "The Comparative study on Accommodative Facility in Myopes and Non-Myopes" मा Myopes र Non-Myopes विरामीको Accommodative facility सम्बन्धि अध्ययन गर्न तपाईको नानीबाबुलाई संलग्न गर्न अनुमति लिन चाहन्छौ

। यस अध्ययन बाट Myopes and Non-Myopes बिचको Accommodative facility लाई तुलनात्मक अध्ययन गरिने छ । यो अनुसन्धान नेपाल स्वास्थ्य अनुसन्धान परिषदबाट स्विकृत भएको र यस अनुसन्धानमा तपाईको नानीबाबुलाई समावेश गराइने जानकारी गराँउदछौ ।ं यस अनुसन्धानबाट तपाई/तपाईको नानीबाबुलाई कुनै पनि क्षति हुने छैन । अध्ययनको समय ५ देखि १० मिनेट लाग्नेछ । यस अध्ययनमा तपाईको नानीबाबुको सहभागिता पूर्ण स्वैच्छिक हुनेछ । यस अनुसन्धानमा तपाई/आफुले चाहेमा कुनै पनि समयमा विना संकोच छोड्न सक्नुहुनेछ । अनुन्धानकर्ता तपाई/तपाईको नानीबाबुलाई यो विश्वास दिलाउन चाहन्छ कि यहाँबाट प्राप्त सम्पूर्ण विवरण गोपनीय ढंगले राखिनेछ र प्राप्त विवरण विशुद्ध यस अध्ययनकोलागि मात्र प्रयोग गरिने छ । जब यो अध्ययन प्रकाशित गरिने छ तब तपाईको र नानीबाबुको नाम उल्लेख गरिने छैन । क्लिनिकल रेकर्ड, अनुसन्धान रेकर्ड र अन्य तथ्याङ्कको गोपिनियता कायम राखिनेछ ।

यस अनुसन्धानमा सहभागी हुनका लागि तपाईबाट कुनै प्रकारको शुल्क या सुविधा लिइने/दिने छैन । यदि अध्ययनको बीचमा आफू सङ्लग्न हुन नचाहेमा तपाई वा तपाईको नानीबाबु माथि कुनै प्रकारको अवरोध/दबाव दिइने छैन । यदि कुनै किसिमको जिज्ञासा अथवा केहि सोध्न मन भए सोध्न पाउनु हुनेछ । तसर्थ यस अध्ययनमा तपाईको नानीबाबुहरुलाई सामेल गराउन तपाईको सहमतिको अपेक्षा गर्दछौं ।

मञ्जुरीनामा मैले यस मञ्जुरीनामा पूरै पढेको छु र यहाँ उल्लेखित सबै कुरा साथै यसको उद्धेश्य बुझेको छु । त्यसैले म यसको अध्ययनमा सहभागी हुनको लागि अनुमति दिन तयार छु । यो मञ्जुरिनामामा हस्ताक्षर गरेर मेरो कुनै कानुनी अधिकार हनन हुने छैन भनेर विश्वस्त छु ।

तपाईलाई यस अध्ययन र अनुसन्धान वा कुनै समस्याको बारेमा प्रश्नहरु छन् भने यस अनुसन्धानका मुख्य अनुसन्धानकर्ता

श्री चन्द्र नारायण राजवंशीलाई मोबाइल नं. ९८०६०७६२२२मा फोन गर्नुहोस् वा mechinetralaya@gmail.com मा ईमेल गर्नुहोस् ।

 तपाईको सहयोग प्रति यस मेची नेत्रालय आभार प्रकट गर्दछ ।

सहमती प्रदान गर्ने

सहभागी/सहभागिको अभिभावकको नाम :   सहभागी बालक/बालिकाको नाम :

हस्ताक्षर :   उमेर :

ठेगाना :