

# A study of prevalence of various refractive errors and their risk factors among the patients at ophthalmology department of tertiary health care center

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## Abstract

**Introduction:** Refractive errors are the leading cause of visual impairment throughout the world as illustrated in the WHO record. **Aims and Objectives:** To Study prevalence and risk factors of various refractive errors among the patients at Ophthalmology Department of tertiary health care center. **Material and Methods:** This was cross-sectional study among the Attendants of Ophthalmology OPD at tertiary health care center during the year 2014 in all the Individuals who attended OPD were screened for the Refractive errors Total 468 individuals were having refractive error they were included into the study, All details Ophthalmological checkup for diagnosis of Type of Refractive error was done then past history regarding the associated risk factors also interrogated. The data was tabulated and arranged in percentages.

**Result:** Majority of the patients were in the age group of >60 i.e. 32.05% followed by 50 -60- 20.94% ; in 40-50 - 15.59% ; in 30-40 i.e. 11.96% ; in 10-20 - 10.47% and in 20-30- 6.19% and in <10 were 2.77%. Majority of the patients were Male i.e. 54.91% followed by Females i.e. 45.08 %. The Prevalence of Various Types of Refractive error were Simple Myopia 28.84% followed by Simple Myopic Astigmatism (SMA) i.e. 13.88% followed by Compound Myopic Astigmatism (CMA)- 13.46%, Simple Hypermetropia (SH) were 13.46%; Simple Hypermetropic Astigmatism were 12.60%, Compound Hypermetropic Astigmatism were 10.25%; Mixed Astigmatism were 10.25%. Most common Risk factors associated were Male 54.91% followed by Hypertension i.e. 32.05%. Diabetes in 29.70%; Smoking in 23.93% ; Nuclear cataract in 19.65% ; Frequent TV Watching 19.01%; Continuous Reading and Writing -16.88%. Family history in 8.11%. **Conclusion:** In our study we found the prevalence of were Simple Myopic Astigmatism (SMA) followed by Compound Myopic Astigmatism (CMA)-, Simple Hypermetropia (SH), Simple Hypermetropic Astigmatism etc. and most common Risk factors associated were Male sex followed by Hypertension, Diabetes, Smoking ; Nuclear cataract ; Frequent TV Watching, Continues Reading and Writing, Family history etc.

**Keywords:** Simple Myopia, Compound Myopic Astigmatism (CMA), Simple Hypermetropia (SH), Hypermetropic Astigmatism, Refractive Errors.

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Received Date: 15/03/2015 Revised Date: 29/03/2015 Accepted Date: 20/04/2015

Access this article online	
Quick Response Code:	Website: <a href="http://www.statperson.com">www.statperson.com</a>
	DOI: 24 April 2015

## INTRODUCTION

Refractive errors are the leading cause of visual impairment throughout the world as illustrated in the

WHO record. According to WHO in 2010, 285 million people were visually impaired, of which 39 million were blind. 120 million cases are reported to be due to uncorrected refractive error and about 19 million children are visually impaired due to refractive errors.<sup>1</sup> Studies have shown the prevalence and magnitude of refractive errors in the population. Above the age of 40 years there occur some changes in the crystalline lens, which leads to change in the refractive status of the person. Genetic and environmental influences are said to play an additional role in it.<sup>2-6</sup> In Childhood also; Prevalence of childhood blindness varies from 1.5/1000 in developing countries to about 0.3/1000 in developed nations<sup>7</sup>. Refractive errors remained most important cause of visual impairment in childhood worldwide, and contributes for about 19% of

total blindness in the world<sup>8</sup> A round 12.8 million peoples in the age group of 5-15 years are visually compromised due to under correction of refractive error or uncorrected refractive errors, worldwide prevalence of 0.96%, with highest prevalence reported in urban and highly developed urban areas in south-east Asia and China<sup>9</sup>. Simple Myopia, commonly referred to as short sightedness is a form of refractive error and is a very common cause of visual disability throughout the world. The condition may present as blurred distance vision, eye rubbing and squeezing of the eyes. School myopia commences around 5-15 years of age and tends to stabilize in the late teens and is mainly thought to be idiopathic. Refractive error studies were conducted in children aged 5-15 years in different countries including India.<sup>21</sup> In the study, conducted in 2001, the prevalence of myopia at an urban location (Delhi) was 7.45%<sup>20</sup> and 4.1% at a rural location (Mahmoodnagar in Andhra Pradesh).<sup>22</sup> Realizing the enormous need for correction of refractive errors worldwide, the World Health Organization has adopted the correction of refractive errors in developed and developing countries as one of the main priorities in its “Vision 2020: the right to sight” initiative.<sup>10</sup> The pattern of refractive errors varies according to population characteristics such as age, gender and ethnic group So, this study was undertaken with intention to see prevalence and risk factors at tertiary health care center for early treatment.

**MATERIAL AND METHODS**

This was cross-sectional study among the Attendants of Ophthalmology OPD at tertiary health care center during the year 2014 in all the Individuals who attended OPD were screened for the Refractive errors Total 468 individuals were having refractive error they were included into the study, All details Ophthalmological checkup for diagnosis of Type of Refractive error was done then past history regarding the associated risk factors also interrogated. The data was tabulated and arranged in percentages.

**RESULT**

**Table 1:** Distribution of the Patients as per the Age

Age	No.	Percentage (%)
<10	13	2.77%
10-20	49	10.47%
20-30	29	6.19%
30-40	56	11.96%
40-50	73	15.59%
50 -60	98	20.94%
>60	150	32.05%
<b>Total</b>	<b>468</b>	<b>100</b>

From above Table the Majority of the patients were in the age group of >60 i.e. 32.05% followed by 50 -60- 20.94%;

in 40-50 - 15.59% ; in 30-40 i.e. 11.96% ; in 10-20 - 10.47% and in 20-30- 6.19% and in <10 were 2.77%.

**Table 2:** Distribution of the Patients as per the Sex

Sex	No.	Percentage (%)
Male	257	54.91%
Female	211	45.08 %
<b>Total</b>	<b>468</b>	<b>100</b>

From above Table it is clear that the Majority of the patients were Male i.e. 54.91% followed by Females i.e. 45.08 %.

**Table 3:** Distribution of the Patients as per the Various types of Refractive Error

Simple Myopia	No.	Percentage (%)
Simple Myopia	135	28.84%
Simple Myopic Astigmatism (SMA)	65	13.88%
Simple Hypermetropia (SH)	63	13.46%
Simple Hypermetropic Astigmatism	59	12.60%
Compound Myopic Astigmatism (CMA)	48	10.25%
Compound Hypermetropic Astigmatism.	50	10.68%
Mixed Astigmatism	48	10.25%
<b>Total</b>	<b>468</b>	<b>100%</b>

From above Table the Prevalence of Various Types of Refractive error were Simple Myopia. 28.84% followed by Simple Myopic Astigmatism (SMA) i.e. 13.88% followed by Compound Myopic Astigmatism (CMA)-10.25%, Simple Hypermetropia (SH) were 13.46%; Simple Hypermetropic Astigmatism were 12.60%, Compound Hypermetropic Astigmatism were 10.68%; Mixed Astigmatism were 10.25%.

**Table 4:** Distribution of the Patients as per the Risk factors associated

Risk Factors	No.	Percentage
Male	327	68.87%
Hypertension	150	32.05%
Diabetes	139	29.70%
Smoking	112	23.93%
Nuclear cataract	92	19.65%
Frequent TV Watching	89	19.01%
Continuous Reading and Writing	79	16.88%
Family history	38	8.11%

The most common Risk factors associated were Male 54.91% followed by Hypertension i.e. 32.05%. Diabetes in 29.70%; Smoking in 23.93%; Nuclear cataract in 19.65%; Frequent TV Watching 19.01%; Continuous Reading and Writing -16.88%. Family history in 8.11%.

**DISCUSSION**

In our study we found that the Majority of the patients were in the age group of >60 i.e. 32.05% followed by 50 -60- 20.94% ; in 40-50 - 15.59% ; in 30-40 i.e. 11.96% ; in 10-20 - 10.47% and in 20-30- 6.19% and in <10 were 2.77% old age persons were more this could be because there are many risk factors in old age like Hypertension,

Diabetes age relates presbyopic changes and cataract so affect vision more. This was similar to Aliyu Hamza *et al*<sup>11</sup>. The Majority of the patients were Male i.e. 54.91% followed by Females i.e. 45.08 % this could be because Myopia and Presbyopia and cataract are more common in Males so these conditions may be affecting Refractive errors but this was not in confirmation with Tuladhar S<sup>12</sup> The Prevalence of Various Types of Refractive error were Simple Myopia 28.84% followed by Simple Myopic Astigmatism (SMA) i.e. 13.88% followed by Compound Myopic Astigmatism (CMA)-13.46%, Simple Hypermetropia (SH) were 13.46%; Simple Hypermetropic Astigmatism were 12.60%, Compound Hypermetropic Astigmatism were 10.25%; Mixed Astigmatism were 10.25%. This is in confirmation with Christian Wolfram *et al*<sup>19</sup> they found Myopia was present in 35.1% of this study sample, hyperopia in 31.8%, astigmatism in 32.3% and anisometropia in 13.5%. Also we have observed that Myopia were more common in young and Childhood age and Astigmatism and Hypermetropia were more common in old ages. These findings are in confirmation with Studies conducted in Kathmandu showed the prevalence of refractive error as 8.1%; myopia: 4.3%, hypermetropia: 1.3%,<sup>13</sup> whereas a study in Mechi found the refractive error to be 2.2%.<sup>11</sup> Different countries have various prevalence of refractive error, like 15.1% in India;<sup>14</sup> 13.6 % in Chile; 15 18.8% in China.<sup>15</sup> Most common Risk factors associated were Male 54.91% followed by Hypertension i.e. 32.05%. Diabetes in 29.70%; Smoking in 23.93%; Nuclear cataract in 19.65%; Frequent TV Watching 19.01%; Continuous Reading and Writing-16.88%. Family history in 8.11%. The risk factors were varied among the different types of Refractive errors e.g. Hypertension, Diabetes, Smoking, Nuclear cataract were more common among the patients of astigmatism while Frequent TV Watching, Continuous Reading and Writing, Family history were more common in Myopic patients this is in confirmation with Sannapaneni Krishnaiah<sup>16</sup> showed a significant increase in myopia with nuclear cataract. Because nuclear cataract results from age-related changes in the lens, a significant interaction between age and nuclear cataract is responsible for this finding. Myopic shift in the very elderly group was found to be associated with age-related changes in the lens in a previous study in Melbourne.<sup>18</sup> In the elderly, lens nuclear opacity becomes an additional significant predictor of refractive error.<sup>17,18</sup> This is consistent with our findings that the degree of nuclear opacity was positively associated with the prevalence of myopia and inversely associated with the prevalence of hyperopia. Changes in the refractive index of the lens substantially influence the shift of refraction. Thus, denser nuclear cataract in the

elderly may drive the refractive error in the minus direction, which makes the hyperopic shift less evident. This is supported by data from the longitudinal Beaver Dam Eye Study which showed that after a 10-year period, younger adults became more hyperopic, and whereas older adults and elderly people became more myopic, and much of this may have been related to increasing nuclear opacity. The positive association of other factors such as smoking and hypertension with refractive error contradicts the previously published report. It was also found that Diabetes and cataract is significantly associated with hyperopia<sup>16</sup>.

## CONCLUSION

In our study we found the prevalence of Refractive error was highest for Simple Myopia followed by Simple Myopic Astigmatism, Compound Myopic Astigmatism, Simple Hypermetropia, Simple Hypermetropic Astigmatism, Compound Hypermetropic Astigmatism and Mixed Astigmatism. Common Risk factors associated were Male sex followed by Hypertension, Diabetes, Smoking, Nuclear cataract, Frequent TV Watching, Continuous Reading and Writing, Family history etc.

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Source of Support: None Declared  
Conflict of Interest: None Declared