



STUDY OF PREVALENCE AND PATTERN OF REFRACTIVE ERRORS AMONG SCHOOL CHILDREN (7-15 YRS) IN URBAN SCHOOLS(PEELAMEDU)

RANI SUSHAMA

Department of Ophthalmology,
PSG INSTITUTE OF MEDICAL SCIENCE & RESEARCH

Abstract : PURPOSE- TO STUDY THE PREVALENCE AND PATTERN OF REFRACTIVE ERRORS AMONG SCHOOL CHILDREN (7-15 YRS) IN URBAN SCHOOLS IN PEELAMEDU. MATERIALS AND METHODS- WE DID A CROSS SECTIONAL AND TIME BOUND STUDY IN WHICH RANDOM CLUSTER SAMPLING AMONG STUDENTS IN 8 SELECTED SCHOOLS WERE EXAMINED FOR VISUAL IMPAIRMENT.THEY WERE THEN EXAMINED IN OUR OUTPATIENT DEPARTMENT AND REFRACTION WAS DONE AND BEST GLASSES WERE PRESCRIBED. RESULTS- A TOTAL OF 2400 CHILDREN AGED 7 TO 15 YRS UNDERWENT VISION SCREENING. OUT OF WHICH 1411 WERE MALES AND 989 WERE FEMALES.AN UN-AIDED VISUAL ACUITY OF 6-6(P) OR WORSE WAS PRESENT IN ONE OR BOTH EYES IN 324 CHILDREN. THE TOTAL PREVALANCE OF DIFFERENT PATTERNS OF REFRACTIVE ERROR WAS 13.5 PERCENT.IN OUR STUDY 144 CHILDREN (44.4PERCENT) WERE HAVING ASTIGMATISM, 109 CHILDREN(33.65PERCENT) WERE HAVING MYOPIA AND 71 CHILDREN (22.01PERCENT) HAD HYPERMETROPIA.IN OUR STUDY ABOUT 106 CHILDREN HAD VISUAL COMPLAINTS AND 184 CHILDREN WERE WITHOUT ANY COMPLAINTS BUT HAVING REFRACTIVE ERROR AND 34 WERE ALREADY HAVING GLASSES. FEMALES (58.34PERCENT) HAD MORE INCIDENCE OF ASTIGMASTISM COMPARED TO MALES (41.66PERCENT) AND COMMONEST TYPE OF ASTIGMATISM FOUND IN THE STUDY IS COMPOUND MYOPIC TYPE (31.25PERCENT). AMONG THE DEFECTIVES THERE WAS NO CORRELATION FOUND WITH THE SOCIOECONOMIC STATUS. CONCLUSION-SIGNIFICANT PROPORTION OF CHILDREN OF THIS AREA HAD UNCORRECTED REFRACTIVE ERROR.INCIDENT OF AMETROPIA WAS MORE IN FEMALES.ASTIGMATISM WAS THE COMMONEST TYPE OF REFRACTIVE ERROR OF WHICH COMPOUND MYOPIC ASTIGMATISM WAS THE MAXIMUM.THERE WAS NO CORRELATION WITH ECONOMIC STATUS.MOST OF THE CHILDREN AND PARENTS WERE UNAWARE

ABOUT THE REFRACTIVE ERROR AND MOST OF THEM WERE DETECTED DURING THE SCREENING.

Keyword :refractive error, children, myopia, hypermetropia, astigmatism

REFRACTIVE ERROR IS THE MOST COMMON CAUSE OF VISUAL IMPAIRMENT.THE CHILDREN WHO WERE DISCOURAGED BECAUSE OF VISUAL IMPAIRMENT ADDED TO THE ALREADY CONSIDERABLE NUMBER OF SCHOOL DROPOUTS.THEREFORE THE MAGNITUDE OF THE PROBLEMNEEDS A SYSTEMIC ASSESSMENT.

THIS STUDY EVALUATES THE
PREVALENCE OF REFRACTIVE ERROR IN SCHOOL CHILDREN AND STUDIES

OTHER RELEVANT FACTORS SUCH AS AGE, SEX, AND SOCIOECONOMIC STATUS BEARING ANY RELATIONSHIP WITH REFRACTIVE ERRORS.

REFRACTIVE ERRORS HAVE BEEN OBSERVED IN THE HUMAN RACE SINCE ANTIQUITY.KEPLER (1604) WAS THE FIRST TO GIVE THE OPTICAL EXPLANATION OF MYOPIA AS BY THAT TIME THE ANATOMY OF EYES WAS WELL KNOWN. VONGRAEFE IN 1954 WAS THE FIRST TO CORRELATE THE OPHTHALMOSCOPIC AND DEGENERATIVE CHANGES OF PATHOLOGIC MYOPIA. LAATIKAINEN LAND ERKKILA IN 1980 HAD STUDIED AND ASSESSED REFRACTIVE ERRORS AND OTHER OCULAR FINDINGS IN 411 SCHOOL CHILDREN OF AGE GROUP 7 TO 15 YRS SELECTED FROM ALL COMMUNITIES UUSIMAA OF SOUTHERN FINLAND WERE SCREENED.THE TOTAL PREVALANCE OF ALL PATTERNS OF REFRACTIVE ERRORS WAS FOUND TO BE 22.6%.

AGARWAL R.S (1942) HAS FOUND THAT THE PREVENTION OF MYOPIA IN SCHOOLS AS STUDIED BY RISLAY, WHO HAD OBSERVED IN HIS DISCUSSION OF THE SUBJECT IN NORRIS AND OLIVERS SYSTEM OF DISEASES OF THE EYE."THE INJURIOUS RESULTS OF EDUCATIONAL PROCESS WERE NOT NOTABLY ARRESTED AND ALSO THERE WAS INCREASE OF BOTH PERCENTAGE AND DEGREE OF MYOPIA IN SCHOOLS."DR BATES OF AMERICA DISCOVERED THE FACT WHILE EXAMINING

THE EYES OF 1560 SCHOOL CHILDREN AT GRAND FORKS IN 1903 , IN SOME WAY VISION WAS IMPROVED BY READING THE SNELLENS TEST CARD.

VENKATASWAMY. G HAD CONDUCTED A RANDOM SAMPLE SURVEY OF EYE EXAMINATION OF 1650 SCHOOL CHILDREN IN MADURAI CITY. HE FOUND OUT THAT THE INCIDENCE OF DEFECTIVE VISION LESS THAN 6/6 WAS 15.1% DUE TO UNCORRECTED REFRACTIVE ERRORS. PROJECTING THE DATA OBTAINED IN THE RANDOM SAMPLE SURVEY TO THE TOTAL POPULATION OF 1,16,770 SCHOOL CHILDREN IT MAY BE NOTED THAT 17,611 CHILDREN HAD DEFECTIVE VISION.

AIMS AND OBJECTIVES OF THE STUDY

TO STUDY AND EVALUATE THE PREVALENCE OF REFRACTIVE ERRORS IN THE SELECTED SCHOOL CHILDREN (7-15) YRS IN PEELAMEDU.

TO STUDY THE VARIOUS PATTERNS OF REFRACTIVE ERRORS LIKE MYOPIA, HYPERMETROPIA AND ASTIGMATISM.

TO STUDY OTHER RELEVANT FACTORS SUCH AS AGE, SEX , SOCIOECONOMIC STATUS ETC BEARING ANY RELATIONSHIP WITH REFRACTIVE ERRORS.

MATERIALS AND METHODS

WE DECIDED TO HAVE RANDOM CLUSTER SAMPLES.8 RANDOMLY SELECTED SCHOOLS FROM PEELAMEDU WAS SELECTED FOR OUR STUDY.

METHOD OF COLLECTION OF DATA

THIS IS A CROSSECTIONAL AND TIME BOUND STUDY IN WHICH RANDOM CLUSTER SAMPLING AMONG STUDENTS IN 8 SELECTED SCHOOLS WERE EXAMINED FOR VISUAL IMPAIRMENT. THE PURPOSE AND METHOD OF EXAMINATION OF STUDENTS WERE EXPLAINED TO THE HEADS OF THE SCHOOLS CONCERNED.

VISUAL ACUITY WAS TESTED WITH SNELLENS CHART.THE LIST OF STUDENTS OBSERVED TO HAVE A VISION OF 6/6 P OR LESS WAS GIVEN TO THE CLASS TEACHER AND SCHOOL HEAD MISTRESS/ MASTER. THEIR PARENTS WERE INFORMED BY THE SCHOOL AUTHORITY TO BRING THE STUDENTS TO OUR OUTPATIENT DEPARTMENT TO DO THE FOLLOWING EXAMINATIONS:

TORCH LIGHT , SLIT LAMP , RETINOSCOPY AND FUNDUS

EXAMINATION.

REFRACTION WAS ASSESSED AND **PRESCRIPTION** WAS GIVEN AND THE CONDITION AND PROGNOSIS WERE DISCUSSED WITH PARENTS.THEY WERE ALSO ADVISED TO GET REFRACTION TESTED AT REGULAR INTERVALS. DATA WAS RECORDED AND ANALYSED.

INCLUSION CRITERIA

SCHOOL CHILDREN BETWEEN 7-15 YRS OF AGE OF EITHER SEX IN THE SELECTED SCHOOLS

exclusion criteria.

visual impairment due to

- ø corneal opacities
- ø lens opacities
- ø retinal diseases
- ø optic nerve diseases
- ø those with acute and systemic illnesses.

Observation :

our study of prevalence and pattern of refractive errors in school children aged 7-15 yrs of peelamedu was conducted from march 2011-september 2011. a total of 2400 school children were screened for the prevalence of different types of refractive errors in the age group of 7-15 yrs . following observations were made during the study

out of 2400 screened, 786 were in the age group of 7-9, 809 children were in the age group of 10-12, and

805 WERE IN THE AGE GROUP OF 13-15

TOTAL NO OF CHILDREN EXAMINED	TOTAL NO REFRACTIVE ERRORS DETECTED	PERCENTAGE OF AMETROPIA
2400	324	13.5%

sex distribution of the children examined

sex	no of cases	percentage
male	1411	58.8%
female	989	41.2%
total	2400	100 %

age distribution of the children with refractive error

si.n o.	age	refractive error	percentage
1	7-9	94	29.01
2	10-12	123	37.96
3	13-15	107	33.02
4	total	324	100

distribution according to visual acuity

visual acuity	no of children	percentage
6/6(p) to 6/9	149	45.98
6/12 to 6/18	120	37.03
6/24 to 6/36	46	14.19
6/60 and below	9	2.80
total	324	100

type of refractive errors

Type of error	No of children with ametropia	Percentage
astigmatism	144	44.44
myopia	109	33.65
hypermetropia	71	22.01
Total	324	100

sex distribution according to type of ametropia

	male	female	total
myopia	64	45	109

Hypermetro pia	32	39	71
astigmatism	60	84	144
Total	156	168	324

our study shows that out of 324 children who were found to be having refractive error, 34 students (10.49%) were already using spectacles at the time of screening, and 106 (32.71%) students had symptoms and 184 (56.80%) were without symptoms. in the present study myopia was found in 109 children accounting to 4.54%. among them, 30.27% were in age group of 7-9 yrs. 33.95% were in age group of 10-12 yrs. 35.78% were in age group of 13-15 yrs. maximum myopia was in the age group 13-15 years. of the 71 children with hypermetropia, 63.38% were in age group of 7-9 yrs. 23.9% were in age group of 10-12 yrs. 12.68% were in age group of 13-15 yrs. maximum hypermetropia was found in age group of 7-9 yrs. in the present study 144 children had astigmatism accounting to 6% among them 29.16% were in the age group of 7-9 yrs 34.02% were in the age group of 10-12 yrs 36.82% were in the age group of 13-15 yrs maximum astigmatism prevalence was in age group 13-15 years

Discussion :

in the present study of prevalence and pattern of refractive errors among school children (aged 7 to 15 yrs) in peelamedu town from march 2011 – september 2011 : a total of 2400 children aged 7 to 15 yrs underwent vision screening. out of which 1411 were males and 989 were females. an unaided visual acuity of 6/6(p) or worse was present in one or both eyes in 324 children. The total prevalence of different patterns of refractive error which includes hypermetropia, myopia and astigmatism was 13.5%. the present can be compared with the study conducted at madurai city by venkataswamy.g which showed an incidence of 15.1% and study

conducted in kemplu district of uganda (2000) which showed an incidence of 12% and a study conducted in shunyi district, china by zaho, xiangjun which showed an incidence of 12.8% and a study conducted by lions hospital bangalore (13.2%) and a study in chileleflorida (15.8%).in the present study about 786 children were in the age group of 7 to 9 yrs, 809 were in the age group of 10 to 12 yrs and 805 were 13 to 15 yrs. in the present 156 male children and 168 female children had refractive error. astigmatism, 109 children(33.65%) were having myopia and 71 children (22.01%) had hypermetropia. in our study 149 children had a visual acuity of 6/6(p) to 6/9 and 120 were having visual acuity of 6/12 to 6/18, 42 children were having 6/24 to 6/36 and 9 are having visual acuity of 6/60 or below. incidence of astigmatism compared to males (41.66%) and commonest type of astigmatism found in the study is compound myopic type (31.25%).this study also aimed at finding the risk factors for refractive errors. according to classification of economic status, all the children in our study belonged to the middle group. Among the defectives there was no correlation found with the economic status, and was consistent with findings of study done at allahabad. how ever, there was no significant correlation found with annual income and refractive errors in our study.

Conclusion :

Our present study shows that significant proportion of children of this area had uncorrected refractive error. most of the children and parents were unaware about the refractive error and most of them were detected during the screening. This warrants an urgent action to correct i.e regular screening and correction of refractive error. This will help to improve vision, social participation and psychosocial development. this screening process helps to prevent further deterioration of vision and blindness and irreversible changes in the visual system (amblyopia). in conclusion, significant visual impairment due to refractive error was feared among school aged children living in the area. because most refractive errors can be corrected easily with spectacles and because the visual impairment can have detrimental impact on education and development in the life of children, the strategy is to eliminate this easily treatable cause of visual impairment. prevalence of refractive error is significant in the present study, 156 male children and 168 female children had refractive errors in present study most common refractive error is astigmatism. females (58.34%) have more prevalence of astigmatism compared to males (41.66%) and commonest type of astigmatism found in the study is compound myopic type (31.25%). among the defectives there was no correlation found with the economic status.