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# Etiology & Incidence of Blindness around Bhagalpur District of Bihar.

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***Abstract:*** *The Problem of Blindness is as old as mankind itself, while the problem is universal but its magnitude is much larger in India, one fifth of total blind population of the world is believed to be in India . Lack of knowledge about the role of nutrition,personal hygiene, prompt treatment in case of eye injury contributes considerably in multiplying the incidence of avoidable blindness . some believes and practices in certain community of using collegium in the form of kajal or surma coupled with in difference towards personal hygiene also contributes to spread of eye infections in addition to this quackery is rampant all over the country because of inadequate stage of qualified eye care services particularly in rural areas. Whatever services are available those are not near by homes, even manpower resources are being underutiliseddue to rural- urban imbalances thus blindness is one of the most dreadful affliction of human being as not onlyit makes the life measurable but a blind person becomes liability to a family, society and country as a whole .*
*Keywords:VA(Visual Acuity),VI(Visual Impairment).NPCB(National Program For Control OfBlindness),WHO(World Health Organisation),SJED(Social Justice & Empowered Department),ICD(International Classification Of diseases )*

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## I. Introduction

From Medical Point of view blindness means lack of perception of light. In ordinary Parlance persons lacking perception of light are said to be "Complete Blind" but there are many others who can perceive light and motion, can count finger at an arm length even they can spot a pin on the floor but fail to see a moving van on the road. This class of people is grouped as "partial Blind" and they also come under the blind from legal point of view.Thus various attempts have been made to give concise and comprehensive definition of blindness, one based on measurement and quantification of visual acuity and visual field&second one based on functional disability alluded to "Economic Blindness" .

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For the first time in 1975 an international standard definition of blindness was developed & included in international classification of diseases-9. Under this classification based corrected visual acuity in the better eye was used to classify visual impairment in five categories, category 1 and 2 complying low vision and category 3,4 & 5 as blindness in which the criteria for blindness were based corrected visual acuity less than 3/60 (snellen or its equivalent or visual field $<10^0$ around a central fixation in better eye).The Purpose of this classification was to facilitate the collection of information of statistical data on visual impairment and blindness in a uniform manner that may be compared at a global level . Countries were advised to define blindness as per their own socio and economic condition but to report internationally as per ICD-9 categories. In 2002 further convention held for classification of diseases in which classification system retained as ICD-9 only the final diagnosis codes under went a revamp as per ICD-10 convention. Further in 2006 a consultation group constituted by WHO recommended a significant modification to the classification in which definition of blindness remained as ICD-9 but low vision category 1 was replaced by moderate visual impairment and category 2 was replaced by sever visual impairment and this is the current internationally acceptteddefinition on blindness and term as modified "ICD-10". Thus present classification of visual impairment based on ICD-10 2006 revision .

| Category | Worse than | Equal to or better than |
|---|---|---|
| 1. Mild or no visual impairment (Category – 0) | - | 6/18 |
| 2. Moderate Visual Impairment (Category – 1) | 6/18 | 6/60 |
| 3. Severe Visual Impairment (Category – 2) | 6/60 | 3/60 |
| 4. Blindness (Category – 3) | 3/60 | 1/60 or Counting finger at 1mt |
| 5. Blindness (Category – 4) | 1/60 or Counting finger at 1mt | light Perception |
| 6. Blindness (Category – 5) | No light perception | ___ |

## II. Material And Method

The Present work entitled etiology & incidence of blindness around Bhagalpur district of Bihar was carried on patients attending eye outdoor department of Jawahar Lal Nehru Medical College Bhagalpur & some private clinic at & surrounding Bhagalpur town in between January 2016 to Dec 2017 after noting the name, age, sex, occupation, socio-economic condition, history of present complaint,past history of diseases, visual acuity of most of the patient was done .only those cases were recorded for further investigation to know the causes of blindness whose corrected visual acuity was less then 3/60(snellen ) or its equivalent i.e inability to count finger at a distance of 3 meters , than the patient having vision less than 3/60 either in one eye or in both eyes were further investigated in the form of general examination of the patient and local examination of the eyes and special examination related to eye such as tonometry, slit lamp, ratinoscopy, direct & indirect ophthalmoscopy , perimetery etc and special investigation related to the patient in general such as blood sugar, montoux test, X-ray chest, X-ray orbit, C.T orbit & CT brain etc had been done.

OBSERVATION

**Table No –I** Showing incidence of blindness in relation to sex

| Total no. of Patient examined | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Patient | % of Male patient | No. of patient having blindness | % of blindness in relation to particular sex | % of blindness in relation to total no. of patient examined | No. of Patient | % of Female patient | No. of patient having blindness | % of blindness in relation to particular sex | % of blindness in relation to total no. of patient examined |
| 35758 | 20131 | 55.4 | 1439 | 7.14 | 4.03 | 15627 | 44.6 | 1140 | 7.28 | 3.18 |

**Table No-Ii** Showing incidence of blindness in relation to age

| Age | No. of patient (Male + Female having blindness) | % of blindness |
|---|---|---|
| 0-10 Yrs | 421 | 16.4 |
| 10-20 yrs | 103 | 4.0 |
| 20-30 Yrs | 157 | 6.2 |
| 30-40 yrS | 268 | 10.3 |
| 40-50 yrs | 448 | 17.4 |
| 50-60 yrs | 572 | 22.0 |
| >60 yrs | 610 | 23.7 |
| TOTAL | 2579 | 100 |

**Table No-Iii**

| Age | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | No | % | No | % | No | % |
| 0-10 Yrs | 239 | 9.3 | 182 | 7.1 | 421 | 16.4 |
| 10-20 Yrs | 54 | 2.1 | 49 | 1.9 | 103 | 4.0 |
| 20-30 Yrs | 103 | 4.0 | 54 | 2.2 | 157 | 6.2 |
| 30-40 Yrs | 152 | 5.7 | 116 | 4.6 | 268 | 10.3 |
| 40-50 Yrs | 263 | 10.2 | 185 | 7.2 | 448 | 17.4 |
| 50-60 Yrs | 304 | 11.6 | 268 | 10.4 | 572 | 22.0 |
| >60 Yrs | 324 | 12.5 | 286 | 11.2 | 610 | 23.7 |
| Total | 1439 | 55.4 | 1140 | 44.6 | 2579 | 100 |

Showing age and sex distribution of Patient having blindness

**Table No – Iv**

| No. of Patient Examine | No. of Eye Examine | No. of Eye having Blindness | % |
|---|---|---|---|
| 35758 | 71516 | 2903 | 4.05 |

Showing incidence of blindness in relation to eyes

**Table No- V**

| Sex | One Eye blind | | Both Eye blind | |
|---|---|---|---|---|
| | Number | % | No. | % |
| Male(1439) | 1259 | 87.5 | 180 | 12.5 |
| Female(1140) | 996 | 87.4 | 144 | 12.6 |
| Total (2579) | 2255 | 87.4 | 324 | 12.6 |

Showing incidence of unilateral &bilateral blindness on sex basis

**Table No.- Vi**

Showing degree of blindness

| Degree of Blindness | Patient | | Eyes | |
|---|---|---|---|---|
| | Number | % | Number | % |
| 1 Vision less than 3/60 to 1/60 ( Category 3) of visual impairment by ICD | 801 | 31 | 827 | 28.3 |
| 2 Vision less than 1/60 to perception of light( category 4) Of visual impairment by ICD | 1522 | 59 | 1747 | 60.0 |
| 3 Having no perception of light (Category 5) of Visual impairment by ICD | 250 | 10 | 329 | 11.7 |
| Total | 2579 | 100 | 2903 | 100 |

**Table Vii**

Showing categories of blindness

| **Category of blindness** | patient | |
|---|---|---|
| | Number | % |
| (A) Uniocular blind person(2255-87.4%) | | |
| (i) Partially(vision less than 3/60 to perception of light | 2167 | 84.7 |
| (ii) Completely (Having no perception of light | 88 | 2.7 |
| (B) Binocular Blind person (324-12.6%) | | |
| (i) Both eye partially blind | 156 | 6.1 |
| (ii) One eye completely blind & other eye Partially | 95 | 2.7 |
| (iii) Both eye completely blind | 73 | 2.8 |
| Total | 2579 | 100 |

Table No- Viii

Showing Etiological distribution of blindness

| Etiology | Male | | Female | | Total | | eyes | |
|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No. | % | No. | % |
| 1 cataract | 889 | 34.3 | 696 | 26.8 | 1585 | 61.1 | 1681 | 57.9 |
| 2 Glaucoma | 53 | 2.1 | 41 | 1.7 | 94 | 3.8 | 132 | 4.5 |
| 3 posterior segment diseases | 157 | 6.2 | 131 | 5.2 | 288 | 11.4 | 356 | 12.4 |
| 4 Anterior segment diseases | 270 | 10.6 | 221 | 8.5 | 491 | 19.1 | 578 | 19.9 |
| 5 ocular injuries | 25 | 1.0 | 10 | 0.4 | 35 | 1.4 | 41 | 1.4 |
| 6 Trachoma& lid diseases | 15 | 0.6 | 17 | 0.6 | 32 | 1.2 | 41 | 1.4 |
| 7 congenital | 5 | 0.2 | 6 | 0.2 | 11 | 0.4 | 15 | 0.5 |
| Miscellaneous | 25 | 1.0 | 18 | 0.6 | 43 | 1.6 | 59 | 2.0 |
| Total | 1439 | 56.0 | 1140 | 44.0 | 2579 | 100 | 2903 | 100 |

**Table No- Ix**

Showing distribution of different types of cataract responsible for blindness

| Types of cataract | Male | | female | | Total | | Eyes | |
|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No | % | No | % |
| 1 Senile | 821 | 31.6 | 641 | 24.6 | 1462 | 56.2 | 1553 | 53.5 |
| 2. Congenital | 30 | 1.1 | 25 | 1.0 | 55 | 2.1 | 58 | 2.0 |
| 3. Complicated | 17 | 0.6 | 15 | 0.5 | 32 | 1.1 | 32 | 1.1 |
| 4. Traumatic including radiation & other Hazards | 11 | 0.5 | 5 | 0.2 | 16 | 0.7 | 19 | 0.5 |
| 5. Due to systemic diseases | 4 | 0.2 | 6 | 0.3 | 10 | 0.5 | 9 | 0.5 |
| 6. after cataract | 6 | 0.3 | 4 | 0.2 | 10 | 0.5 | 10 | 0.3 |
| Total | 889 | 34.3 | 696 | 26.8 | 1585 | 61.1 | 1681 | 57.9 |

**Table No-X**

Showing different types of glaucoma responsible for blindness

| Types of glaucoma | Male | | Female | | Total | | Eyes | |
|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No | % | No | % |
| 1 absolute | 25 | 1.0 | 19 | 0.8 | 44 | 1.8 | 64 | 2.2 |
| 2. chronic simple | 9 | 0.3 | 5 | 0.2 | 14 | 0.5 | 22 | 0.7 |
| 3. narrow angle glaucoma | 8 | 0.3 | 2 | 0.1 | 10 | 0.4 | 13 | 0.4 |
| 4. secondary glaucoma | 5 | 0.2 | 7 | 0.2 | 12 | 0.4 | 17 | 0.5 |
| 5. aphakic glaucoma | 6 | 0.3 | 4 | 0.2 | 10 | 0.5 | 11 | 0.5 |
| 6. congenital | 0 | 0.0 | 4 | 0.2 | 4 | 0.2 | 5 | 0.2 |
| Total | 53 | 2.1 | 41 | 1.7 | 94 | 3.8 | 132 | 4.5 |

**Table No – Xi**

Showing different types of posterior segment disease responsible for blindness

| Posterior segment diseases | Male | | Female | | Total | | Eyes | |
|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No | % | No | % |
| 1 Optic atrophy | 23 | 0.9 | 30 | 1.3 | 53 | 2.2 | 60 | 2.2 |
| 2. Retinal detachment | 25 | 1.0 | 20 | 0.8 | 45 | 1.8 | 48 | 1.8 |
| 3. Posterior uveitis with retinal involvement | 21 | 0.8 | 21 | 0.8 | 42 | 1.6 | 57 | 1.9 |
| 4. Macular lesion | 19 | 0.7 | 20 | 0.8 | 39 | 1.5 | 48 | 1.8 |
| 5. Myopic chorioretinal degeneration | 5 | 0.2 | 10 | 0.4 | 15 | 0.6 | 24 | 0.7 |
| 6. Diabetic Rationapathy | 10 | 0.4 | 4 | 0.2 | 14 | 0.6 | 22 | 0.6 |
| 7. Hypertensive retinopathy | 5 | 0.2 | 1 | 0.0 | 6 | 0.2 | 12 | 0.6 |
| 8. Eale's diseases | 14 | 0.6 | 0 | 0 | 14 | 0.6 | 18 | 0.7 |
| 9. Retinitis pigmentosa | 9 | 0.4 | 0 | 0 | 9 | 0.4 | 17 | 0.6 |
| 10. Ratinoblastoma | 6 | 0.3 | 3 | 0.1 | 9 | 0.4 | 11 | 0.4 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11.Other non specific | 20 | 0.7 | 22 | 0.8 | 35 | 1.5 | 39 | 1.1 |
| Total | 157 | 6.2 | 131 | 5.2 | 281 | 11.4 | 356 | 12.4 |

**Table No Xii**

Showing different types of diseases of Anterior segment

| Diseases of interior segment | Male | | Female | | Total | | Eyes | |
|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No | % | No | % |
| 1 Anterior uveitis | 25 | 1.0 | 19 | 0.8 | 44 | 1.8 | 53 | 1.8 |
| 2. Corneal opacity due to ulcer | 146 | 5.7 | 104 | 4.0 | 250 | 9.7 | 275 | 9.1 |
| 3. Corneal opacity due to keratomalacia | 21 | 0.8 | 25 | 0.9 | 46 | 1.7 | 72 | 2.9 |
| 4. Anterior staphylomatous condition | 66 | 2.6 | 64 | 2.5 | 130 | 5.1 | 148 | 5.0 |
| 5. Corneal dystrophy | 12 | 0.5 | 9 | 0.3 | 21 | 0.8 | 30 | 1.1 |
| Total | 270 | 10.6 | 221 | 8.5 | 491 | 19. 1 | 578 | 19.9 |

**Table No Xiii**

Showing different types of anomalies responsible for blindness

(excepting congenital cataract and congenital glaucoma)

| Congenital anomalies | Male | | Female | | Total | | Eyes | |
|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No | % | No | % |
| 1 Coloboma of the iris & choroid | 2 | 0.1 | 3 | 0.1 | 5 | 0.2 | 5 | 0.2 |
| 2. Microopthalmus | 2 | 0.1 | 2 | 0.1 | 4 | 0.2 | 6 | 0.2 |
| 3. Total albinism | 1 | 0.0 | 0 | 0.0 | 1 | 0.0 | 2 | 0.05 |
| 4.Anopthalmus | 0 | 0.0 | 1 | 0.0 | 1 | 0.0 | 2 | 0.05 |
| Total | 5 | 0.2 | 6 | 0.2 | 11 | 0.4 | 15 | 0.5 |

**Table No Xiv**

Showing prevalence of curable/ preventable and incurable blindness

| Types of blindness | Patients | | Eyes | |
|---|---|---|---|---|
| | No | % | No | % |
| 1 curable/ preventable | 2048 | 81.3 | 2423 | 83.0 |
| 2. Incurable | 531 | 18.7 | 480 | 17.0 |
| Total | 2579 | 100 | 2903 | 100 |

## III. Discussion & Conclusion

Present work entitled " Etiology and incidence of blindness around Bhagapur district of Bihar had been carried out on 35758 patient out of 35758 patient examined 2579(7.2%) had blindness, further out of 35758 patient 20131 (55.4%) were male and 15687 (44.6) were female and again out of 20131 males 1439 (7.12%) and out of 15627 females 1140(7.8%) had blindness in that particular sex and on further analysis out of 35758 patient only 1439 males (4.03%) and only 1140 female (3.8%) had blindness out of total patient examined. By table it is clear that although absolute number of male are higher than females but privilege rate of blindness is more in female , Which may be due to negligence of female patient by themselves as well as by family members not taking eye care in proper time & by proper doctor, Which may be one of the important reason responsible for relative increasing incidence of blindness in female .

As far as age is concerned maximum rate of blindness is in the age group of more than 60 Yrs of age group which is applicable for male as well as for female. As far as the degree of blindness is concerned it is highest in degree II blindness which is 60% of total blindness,as far as the category of blindness is concerned out of 2579 patient having blindness 2255(87.4% ) had only one eye blind and further out of 87.4 %, 84.7% had partial and only 2.7% had complete blindness. Further out of 2579 patient only 324(12.6%) patient had both eye blind in which 150(6.1%) had both eyes partially blind 95(3.7%) had one eye complete and one eye partially blind and rest 73(2.8%) were such whose both eyes were completely blind so out of 35758 patient which was examined only 324(0.9%) patients were blind in real sense. Thus prevalence rate of blindness in actual is 900per one lakh population further it has been found, out of 2579 patients having blindness 2048(81.3%) had either curable or preventable and rest 531(18.7%) had incurable blindness .

Thus it is evident from the present work that the situation of blindness is still very grave 7.21 % of he population had one or other form of blindness which could be prevented easily by regular checkup & timely medical interference. It could be prevented by legalised the general screening of eyes of the children who are going to be admitted in primary classes . Besidestheseeye care centers should be instituted where a people could be taught about ocular hygiene besides getting primary and proper treatment. These all are possible only by proper utilization of ophthalmologist by posting them in proper place with full equipments and by mobilizing

outresourcesto reach the suffering in mass. For rural areas mobile ophthalmic services could be an important strategy to deal with blindness problem in an economic expedient manner thus we can reach up to the target fixed by vision 20-20 to reduce the prevalence rate of blindness by 0.3% by the year 2020.

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