AETIOPATHOLOGICAL ANALYSIS OF BLINDNESS WITH SPECIAL REFERENCE TO ANATOMICAL LOCATION – A CLINICAL STUDY

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Abstract: *Blindness is very common. The World Health Organization says that around 161million people have at least some degree of "visual impairment", of whom 37 million are blind. There are many causes of blindness, including infections, malnutrition, injury, and ageing. Around 90% of blind people live in developing countries. Surveys to find this out are important as a first step toward providing prevention and treatment services. Surveys play an essential part in international efforts to fight blindness*

Keywords: Blindness,WHO,malnutrition

1.Introduction

Since the estimates of the 1990s, new data based on the 2002 global population show a reduction in the number of people who are blind or visually impaired, and those who are blind from the effects of infectious diseases, but an increase in the number of people who are blind from conditions related to longer life spans. This new information underscores the need to modify the health care agenda to include the management of the diseases that are now becoming prevalent[4].

Magnitude of visual impairment:

Globally, in 2002 more than 161 million people were visually impaired, of whom 124 million people had low vision and 37 million were blind.* However, refractive error as a cause of visual impairment was not included, which implies that the actual global magnitude of visual impairment is greater.

Worldwide for each blind person, averages of 3.4 people have low vision, with country and regional variation ranging from 2.4 to 5.5.

The reasons for decrease, is the impressive successes with elimination of treatable blindness, and the efforts made by countries like Gambia, India, Morocco, Nepal, Sri Lanka, Thailand, and other countries.Poverty underlies not only the causes, but also the perpetuation of ill health, including eye health.Blindness remains a key barrier to development. Health is the centerpiece of development and poverty alleviation; continuing to eliminate avoidable blindness among the poorest of the poor is a moral imperative[3]

- An ever – increasing number of people are at risk of visual impairment as populations grow and demographic shifts move towards the predominance of older age groups[1].

- Potentially blinding eye conditions such as age-related macular degeneration (AMD), diabetic retinopathy and glaucoma are increasing as the number of people affected grows. These are non-communicable chronic eye diseases to which the principles of long-term care including issues of cost of treatment and compliance 9adherence) apply. Additionally, more programmes for those with low vision will need to be made available.

- The global disparity and inequity in the availability of eye health care services still fails to prevent and control an overwhelmingly increasing magnitude of avoidable blindness in the highly populated poorest parts of the world.

- By the 10th Revision of the of the WHO international Statistical Classification of Diseases, injuries and Causes of Death, low vision is defined as visual acuity of less than 6/18, but equal to or better than 3/60, or corresponding visual field loss to less than 20 degrees, in the better eye with best possible correction. Blindness is defined as visual acuity of less than 3/60, or corresponding visual field loss to less than 10 degrees, in the better eye with best possible correction. Visual impairment includes low vision as well as blindness.

- Millions of people suffer from a wide variety of ocular diseases, many of which lead to irreversible blindness. The leading causes of irreversible blindness in the elderly – age-related macular degeneration and glaucoma – will continue to affect more individuals as the worldwide population continues to age[2].

Indian scenario

There is no country in the world to-day where the affliction of blindness is as widespread as in India, nor where the ratio of blindness to population (350 millions) is so high. **The totally blind are estimated at one and a half millions, the partially blind at three millions.**Among the reasons for the failure to tackle the problem of blindness are primarily the fatalism, common to the East, of regarding physical affliction as the act of God; the strength of the family and of the caste system which, though producing many admirable results, limit the outlook and prevent the growth of the civic sense; the fact that nine-tenths of the population live in small and scattered villages or hamlets remote from the amenities of civilized life, and that only one-tenth are able to read and write. Conditions in India are therefore almost exactly the opposite of those prevailing in developed counties, which in the last hundred and fifty years have done more for the blind.

"Then as to the estimates of the partially blind, an analysis of all patients attending the camps of the Blind Relief Association in 1927 and 1928 gave a ratio of three partially blind persons to everyone totally blind. This is the foundation for saying that if there are one and a half million totally blind persons in India,

there are probably about four and a half million partially blind persons as well."

Aims and objectives

Blindness is a worldwide phenomenon causing anguish and economic disaster to the individual and the community as a whole. It is a socio-economic problem and the emphasis should be on the prevention of blindness rather than rehabilitation only and to tackle this problem we should know the exact incidence, nature and the aetiology of the blindness of the population under care. Most of the surveys under-taken, through the good officers of the international organizations, are from either very advanced and sophisticated western countries or extremely poorly developed countries of the third world which do not reflect the true picture of Indian population.

The primary objectives of the present study are to determine the cause of irreversible blindness, both partial and complete with special reference to demographic variables, to understand their temporal variation and simultaneous examination of reasons for the occurrence of this quantum of blindness despite the relentless (continued) efforts of NPCB programmes in EG district of Andhra Pradesh.

OBSERVATIONS AND RESULTS

Table No. 1

Age Structure and frequency distribution of the current sample

Frequency	No.	Percent
< 9 years	20	10%
10 to 19 years	28	14%
20 to 29 years	21	10.50%
30 to 39 years	28	14%
40 to 49 years	34	17%
50 to 59 years	43	21.50%
> 60 years	26	13%
Total	200	100.00%

Table No. 1a Descriptive Statistics of the age structure

	N	**Range**	**Minimum**	**Maximum**	**Mean**
Age in years	**200**	**68**	**2**	**70**	**30.32**

Table No.1, 1a and figure No. 1 depicts the age structure of the present sample. Accordingly the maximum affected age group is 5th decade the work force of the society followed by 1st and 3rd decade, the vulnerable age group, the mean being 30.32 years

Table No. 2 Gender distribution of the current sample

Gender	No. of eases	Present
Male	120	60%
Female	80	40%

Sex Ratio 1 : 054

Table No. 2 and figure No. 2 indicate the gender distribution of the current sample. Thus, males are more affected with blindness than females

Table No. 3 Family income group distribution in the sample

Income groups	No. Percent
< 45,000 pa	85 42.50%
45,000 to 54,000 pa	97 48.50%
55,000 to 65,000 pa	18 9%
Total	200 100%

Table No. 3

Table No. 3, 3a and figure No. 3 shows the buying power of the family. 40% of the sample affected with blindness has annual family income. Relatively affordable chunk makes up to only 8.5%.

Table No. 4 Literacy of the patients

Table No.4 and figure No 4 indicate the literacy of the sample under study. More number of complete blind group are illiterates when compared to partially blind group.

Type of blindness	Illiterate	Percent	Literate	Percent	Total	percent
Complete blind	81	73.91%	50	38.17%	131	66%
Partialy blind	18	26.09%	51	61.83%	69	34.50%
Total	99	49.50%	01	50.50%	200	100%

Table No. 5 and figure No. 5 show the literacy levels of the sample under study. Partially blind group have higher levels of education when compared to complete blind group.

Table No. 6 Literacy levels of the patients

Level	Primary School	High School	Junior College	Degree College	PG	Total
Complete blind	25	15	5	0	0	45
Partially blind	20	15	10	10	3	58
Total	45	30	15	10	3	103

	N	Minimum	Maximum	Mean
Family Income	200	25000	65000	42170

Table No. 5 Literacy levels of the patients

Level	Primary School	High School	Junior College	Degree College	PG	Total
Complete blind	20	10	4	2	0	36
Partially blind	16	20	8	19	5	68
Total	36	30	12	24	5	104

Levels of education of the parents of blind people are exhibited in table No. 6 and figure No. 6. Parents of the partially blind group have higher levels of education when compared to the parents of completely blind.

Table No. 7 Nutritional status of the subjects of the sample

Type of blindness	III nourished (0)	Percent	Mal nourished (1)	Percent	Well nourished (2)	Percent	Total	Percent
Totally blind	**0**	0.00%	24	18.32%	107	81.68%	131	100%
Partially blind	1	1.45%	5	7.25%	63	91.30%	69	100%

Nutritional status of the blind subjects is indicated in table No. 7 and figure No. 7. It can be noted that partially blind people are better nourished when compared to complete blind. However there is not much significant difference between them.

Onset of blindness	Complete Blind		Partially Blind		Total	Percent
	No.	Percent	No	Percent		
Birth	20	18.18%	10	11.11%	30	15.00%
Childhood	25	22.72%	15	16.66%	40	20%
Adulthood	40	36.36%	50	55.55%	90	45%
Old age	25	22.72%	15	16.66%	40	20%
Total	110	100%	90	100%	200	100.00%

Table No. 8 Nature of the blindness

Total No. 8 and figure No. 8 indicate the nature of blindness or the onset of blindness. Partial blindness mostly acquired in adult age whereas congenital or blindness by birth is more in complete blind group

Table No. 9 Distribution of different levels of blindness

Percent of Visual Loss	No. of cases	Present
30	58	29%
40	43	21.50%
75	29	14.50%
100	70	35%

Different levels of visual loss indicating the nature of blindness

Table No. 10 Nature of the blindness in the current

Nature of blindness	100% VL	75% VL	30/40% VL	Total
Congenital	30	10	25	65
Acquired	40	19	76	135
Total	70	29	101	200

The Nature of blindness whether congenital or acquired is depicted in table No. 10 and figure No. 10. On the whole it may noted that acquired blindness in more (135), whether complete or partial, is more when compared to congenital. However congenital condition (65 out of 110) rank first in causing complete blindness.

Table No. 11 Distribution of levels of VL, anatomical location wise

Automation Location	100% VL	75% VL	30/40% VL	Total
AS	25	10	30	65
PS	45	19	28	140
Total	70	29	58	200

The Anatomical location for the causes of blindness is shown in table No. 11 and figure No. 11. On the whole posterior segment causes predominate over anterior segment causes in causing total blindness. Similar trend is noted in causing partial blindness.

Table No. 12 Laterality of blindness in the present sample

Anatmational location	BE	Singe Eye	Total
AS	50	72	122
PS	60	18	78
Total	120	80	200

The laterality of the blindness is given in table No. 12 and figure No. 12. Both eyes got affected in permanent blindness (120 out of 200) when compared to partial blindness where only one is affected.

Table No. 13 Aetiological spectrum of AS blindness

Causes of VL (AS)	100% VL (BE)	75%VL (BE)	30% (SingleEye)
Anophthalmos BE	4	0	0
Ant. Staphyloma	1	0	3
Ant. Uveitis	0	0	2
Atrophic bulbi	1	0	0
Bupthalmos	1	0	0
cryptophthalmos	0	0	1
Corneal dystrophies	2	1	0
Corneal opacity	3	3	7
Cornealopacitywith AL	6	0	7
HZO	0	0	1
Microphthalmus	6	2	0
Phthisis bulbi	2	0	3
Empty socke	0	0	4
Total	33	6	21

The spectrum of conditions related to Anterior segment of Eyen causing blindness are shown in table No. 13 and figure No.13, 13a & 13b congenital conditions like anopthalmos rank first in causing complete blindness affecting BE followed by corneal opacity and anopthalmos. Corneal opacity is the leading causes in causing unilateral blindness.

Table No. 14 Aetiological spectrum of PS blindness

Causes of VL (AS)	100% VL (BE)	75%VL (BE)	30% (SingleEye)
Albinotic fundus	3	0	0
hypoplastic macula	5	3	3
Chorio retinitis	0	1	6
CMV Retinits	5	1	9
Coloboma choroid	0	0	1
Coloboma of Optic dis	0	0	2
Central retinal artery obstruction LE	5		
Glaucomatous fundus	1	0	4
Heridomacular degeneration	15	1	3
Optic atrophy	2	0	5
Pathological myopic degeneration	1	3	1
Posterior uveitis BE	3	0	0
Proliferative diabetic retinopathy	4	1	0
Retinal detachment	32	1	10
Retinitis pigmentosa	1	3	0
Rod cone dystrophic disorder	2	1	0
ARMD	0	0	2
Macular hole	0	0	1
Vitreoushemorrhag post traumaticuveitis		0	3
Total	**77**	**15**	**48**

The spectrum of conditions related to posterior segment of eye causing blindness are shown in table No. 14 and figure No. 14, 14a congenital conditions like retinitis pigmentosa rank first in causing complete blindness of BE followed by corneal opacity and anopthlmos, whereas retinal detachment is the leading cause in cussing unilateral blindness, followed by coloboma of the choroid and corneal opacities.

Table No. 15 Distribution of social causes for blindness

Cause	Complete Blind		Partially Blind	
	No.	Percent	No.	Percent
Ignorance	65	49.61%	30	43.47%
Poverty	50	38.16%	22	31.88%
Non availability	16	12.21%	17	24.63%
Total	131	100	69	100.00%

Table No. 15 and figure No. 15 indicate various social causes for the blindness. Poverty), ignorance and unavailability of eye care services are the common causes of blindness.

Table No. 16 Distribution of Origin blindness

Cause	Complete Blind		Partially Blind	
	No.	Percent	No.	Percent
Congenital	15	11.45%	8	11.59%
Trauma	40	30.53%	34	49.28%
Infection	35	26.71%	10	14.49%
Tumour	0	0.00%		
Not known	41	31.29%	5	7.25%
			12	17.39%
Total	131	100%	69	100%

DISCUSSION

An important issue in attempts at improving the health of a population is to have recent pertinent and acceptable data regarding the health issue that is to be addressed an application of these data to successful development and implementation of a policy that brings about a difference. Subject of blindness in every age group and particularly in elderly have received a lot of attention in literature. Population based estimation of the magnitude and causes of bilateral and unilateral visual impairment would enable understanding of the eye care needs in a population.

Since this is not a sample survey, it is not appropriate to use sampling theory in the analysis and observed figures are actually not estimates. Biases clearly exist as to who and who does not become certified and it must be remembered that these data are hospital based but not population based. Since an individual has to access the hospital eye service to be seen by a consultant ophthalmologist, he or she must have adequate knowledge, awareness which again depends up on the literacy and poverty levels of the individual.

The WHO stresses the importance of collecting within-country data on

causes of visual blindness for use in priority-setting and resource allocation.

These figures can surely be useful as indicators or minimum estimates of the incidence of severe sight loss in the population for planning preventive health care strategies and prioritizing research particularly for irreversible blindness.

With this backdrop, results of the present study are analyzed and discussed as under, in the light of available literature.

Age Structure and Sex ratio

Alain Munier, et al (1998) in their study noted that more than half of the patients were 65 years and older. G. Venkata S Murthy et al in 2005 observed that the highest risk was among those aged 70+. Catey Bunce et al (2006) noted that the majority of certifications were in the older age groups. Age-related macular degeneration (AMD) is the most common cause of vision loss in individuals over 55. (Macular Degeneration; www.fightblindness.org). The mean age of detachment patients in India was 38 years. (D Yorston and S Jalali; 2002).

In the present study the maximum affected age group is 5^{TH} decade the work force of the society followed by 1^{st} and 3 decade, the vulnerable age group. The mean age is 30.32± 1.18 years. The reversible or treatable blindness like cataract is no taken in to consideration in the present study. This has lead to the deviation in the age of occurrence of blindness in the current study (vide table No. & figure No. 1).

Jeremiah Ngondi (2007) noted that prevalence of blindness and low vision increased in both males and females with age. There were no differences between the sexes in the odds of blindness.

Males are more affected (60%) with blindness than females (40%), in the present sample, the **Sex Ration being 1:054.** (Ref. Table No. 2 & figure No. 2). Gender distribution depends upon many factors like, the nature of inheritance, cause of blindness, and social factors like propriety given to the feminine gender in the family as well as literacy levels. Hence this observation is specific for each study and cannot be compared with other studies.

Prevalence

Caroline C. W et al (1998) in their quoted that the prevalence of blindness, according to World Health Organization criteria, ranged from 0.1% in subjects aged 55 to 64 years to 3.9% in subjects aged 85 years or older; the prevalence of visual impairment ranged from 0.1% to 11.8%.

The prevalence of blindness (<6?60) is 1.84% in Andhra Pradesh. (D Yorston and S Jalali; 2002). G Venkata S Murthy et al, observed that (2005), the presenting vision was <6/60, in the better eye, and was observed in 8.5% (95% CI: 8.1 to 8.9). The age, sex, residence, literacy, and working status were associated with blindness.

The prevalence of blindness in the present sample is 2.5% in the age group of 30 to 40 years[5].

Literacy

Vilas Kovai, et al in their study (2005) observed that the odds of seeking treatment was significantly higher for literates odds ratio 1.91, at 95% confidence interval and 1.38 to 2.65 for those who would be defined as blind.

The observations about the literacy of the subjects is somewhat contradicting with the above mentioned study. Illiterates are more (66%) seeking blindness certification. (Vide Table No. 4

& fig. No. 4). Even in literates the literacy levels (36%) are low (Ref Table No. 5 and figure No. 5), having only primary level schooling. The present study indicates literacy and levels of literacy has got definite bearing in the occurrence of permanent blindness whether partial or complete.

Parent's literacy levels also are examined (Table No. 6 & Fig No. 6) in the present study, which indicate the lower the literacy the more the blindness cases in their family.

Social Status

R Dandona et at (2002) in their study opined that increasing age, female sex, decreasing socioeconomic status, and rural area of residence had significantly higher odds of being associated with moderate visual impairment.

Vilas Kovai et al in their study (2005) observed that the Barriers to seeking treatment among those who had not sought treatment despite noticing a decrease in vision over the past five years were personal in 52% of the respondents, economic in 37% and social in 21%.

Social status depends up of literacy nutrition and family income. Hence the family income levels are probed in the current study in prevalence of blindness in the society. Accordingly, 40% of the sample affected with blindness has low annual family (4 member group) in the present sample is 42170 $\pm$ 501.01 rupees p.a. 85% of the sample are well nourished (Ref Table No. 7 and figure No.7) and hence nutritional causes of blindness like Vit A deficiency causing irreversible blindness in less in this sample (to be discussed in the following paragraphs under aetiology).

Laterality of blindness

Jeremiah Ngondi; (2007) noted that prevalence of blindness (presenting VA of less than 3/60 in the better eye) was 4.1% (95% confidence interval (CI), 3.4 – 4.8); prevalence of low vision (presenting VA of at least 3/60 but less than 18/60 in the better eye) was 7.7% (95% CI, 6.7 – 8.7); whereas prevalence of monocular visual impairment (presenting VA of at least 18/60 in better eye and VA of less than 18/60 in other eye) was 4.4% (95% CI, 3.6 – 5.3).

Rahi JS, et al (1995) in their study noted that the major causes of SVI/BL as: (1) Corneal staphyloma, scar and phthisis bulbi (mainly attributable to vitamin A deficiency) in 26.4%; (2) Microphthalmos, anophthalmos and coloboma in 20.7%; (3) Retinal dystrophies and albinism in 19.3%.

Catey Bunce et al (2006) in their study mentioned that 13788 people were certified as blind, 19107 were certified as partially sighted[6].

Blindness in the current study has been classified as congenital or acquired, partial or complete, Unilateral or bilateral and whether caused by Anterior segment disease or posterior segment diseases, to understand the multifaceted nature of blindness in depth.

Accordingly, Partial blindness (34%), mostly unilateral, is more in adult age group, mostly due to acquired causes amounting to 63.78% whereas bilateral and total or complete blindness (65%) is more in younger age group and is due to congenital (28.24%) causes (Vide Table Nos. 8 & 9 and figure Nos. 8 & 9). On the whole the acquired blindness is more 107 subjects out of 110) whether partial or complete (Ref Table No. 10 & figure No. 10)

Anatomical location wise the posterior segment disease causes more (77 out of 110) of permanent blindness where as Anterior segment causes. (33 out of 110), when referred to table No. 11 and figure No. 11. Both eyes got affected (77 out of 110) in

cases of complete blindness (Ref table No. 12 and figure No. 12).

Aetiology

Alain Munier, et al (1998) in their noted that the leading causes of blindness are maculr degeneration and glaucoma, each accounting for 16% (812 and 795). Diabetic retinopathy ranked as the 11th cause of blindness and accounted for 3%. R Dandona, L Dandona, (2003) in their study observed that the prevalence of childhood blindness was 0.17% (95% confidence interval 0.09 to 0.30). R Dandona, L Dandona, (2003) observed that the major causes of blindness included congenital eye anomalies (16.7%) and retinal degeneration (16.7%).

Catey Bunce et al (2006) in their study mentioned that 13788 people were certified as blind, 19107 were certified as partially sighted. The most commonly recorded main cause of certifications for both blindness (57.2%) and partial sight (56%) was degeneration or the macula and posterior pole which largely comprises age – related macular degeneration. Glaucoma and diabetic retinopathy were the next most commonly recorded main causes.

Recent population-based survey in India, found that retinal disease was the primary cause of 1.7% of blindness. (**R Dandona** et al 2001).

Where facilities do exist, distribution is uneven. Andhra Pradesh state, in southern India, has a population of 75 million. There are approximately 15 clinics equipped to carry out laser photocoagulation, half of them in Hyderabad (population 8 million). The neighboring state or Orissa (population 35 million) has no clinics equipped with a laser. The reasons for these differences can be summarized as either genetic eg. Ethnic differences, or environmental eg. Geographic and socio-economic factors, such as lack of facilities. (D Yorston and S Jalali; 2002).

In Andhra Pradesh, 0.5% of blindness is caused by RD. Given that the prevalence of blindness (<6?/60) is 1.84% in Andhra Pradesh, and approximately 0.4% in the UK, it is likely that the prevalence of blindness from RD is similar in India and England. (D Yorston and S Jalali; 2002).

Inadequate primary eye care may lead to misdiagnosis and further delay. Out of 306 eyes with a retinal detachment that were referred to the LV Prasad Eye Institute, 66 (22%) were referred with a different diagnosis. (KRISHNAIAH) Sannapaneni, et al 2006)

Age-related macular degeneration (AMD) is the most common cause of vision loss in individuals over 55. An estimated nine million people in the U.S. either have AMD or are at substantial risk of developing AMD (**Macular Degeneration** www.fightblindness.org)

The results of the present study show that the anterior segment diseases like corneal opacity (8 out of 39) due to various reasons rank first in causing unilateral and partial blindness, followed by congenital condition like microphthalmos (8 out of 39) vide table No. 13 and figure Nos. 13 & 13a.

Congenital conditions like Retinitis Piamentosa (32 out of 92) rank first (vide table No. 14 and figure Nos. 14, 14a and 14b) in causing completed blindness of BE followed by Optic atrophy (17 out of 77 cases), whereas Retinal detachment (10 out of 40) is the leading cause in cussing unilateral blindness, followed by coloboma of the choroid. The macular degenerations (ARWD), Glaucoma are less in the present sample as the age structure of the sample show middle predominance when compared to old age.

Social causes of blindness

Vilas Kovai et al in their study (2005) observed that people could not seek ophthalmic advice due to economic (37%) and social (21%).

Similarly the current study also, probed into the social economic and literacy factors in the prevalence of blindness, which showed that poverty is the leading cause (48.09%) of BE blindness followed by ignorance and unavailability of eye care services. Non-availability ranks first in causing unilateral blindness (39.13%) followed by ignorance and poverty. (Ref. Table No. 15 and figure No. 15).

Origin of blindness

Limpaphayam PW, et al; (1972) cited that Injuries were the cause of blindness in 119 patients (11.82%) only a few of them were women. The dominance of men in this group is largely because they form the majority of the work force. The maximum cases were in the 2nd to 5th decade, this being the most active period in one's occupational and social life.

According to W.H.O (1979) reports corneal diseases were responsible for one hundred and fifty five cases (15.40%) of blindness. W.H.O. has also reported the corneal diseases account for the major share of blindness in Pakistan, Nepal, Kenya (36%), Uganda (40.6%) and other third world countries. Corneal opacities and adherent leukomas were (69.30%), and form the major cause of blindness. These lesions were mainly of traumatic nature as this is an agriculture area.

Sandal DK, et al, (1979) in their study opined that the causes of blindness are many, and in many cases it is difficult to pin point the cause even though the structural causes are seen. In most cases even this is not possible as specimens for histological studies are not available. Large numbers of causes go undiagnosed and untreated.

KRISHNAIAH Sannapaneni, et al (2006) conducted population-based Andhra Pradesh Eye Disease Study. Main Outcome of this study: A total of 824 (10.6%) subjects gave a history of ocular trauma in either eye, including 76 (1.0%) persons reporting trauma in both eyes. The overall age-and gender-adjusted prevalence of history of eye injury in this rural population was 7.5% (95% confidence interval (C1), 7.0%-8.1%). Men were more likely to have an eye injury than women (odds ratio [OR], 2.1[95% CI, 1.8-2.5]). After adjusting for gender and other demographic factors, ocular trauma was significantly more frequent among laborers (OR, 1.5 [95% C1, 1.2-1.7]) when compared with other occupational groups. After adjusting for gender, injury with vegetable matter such as a thorn, branch of a tree, plant secretion, etc. (n=373 [45.3%]) was the major cause of trauma reported in this population. The majority of the eye injuries occurred at the workplace (n=461 [55.9%]), followed by home (n=179 [21.7%])

In the current sample also, traumatic causes rank first whether complete (40%) or partial (49.28%). In approximately equal number of cases, the **cause of blindness is not known**. This is followed by congenital origin. 15% (vide table No. 16 and figure No.16). A man being the work force in the age group of 3rd decade in the present sample, traumatic nature of their blindness is quite justifiable[7]..

Thus, the causes identified indicate the importance both of preventive public health strategies and of specialist ophthalmic and optical services in the management of blindness in India.

The results and findings of present study are in accordance with the studies mentioned above. Any minor deviation may be due to small sample size, errors in sampling, ethnic and geographical variation.

CONCLUSIONS

The present study suggests changing trends in blindness of south India.It would seem that in order to reduce visual impairment in india on a longterm basis we have to base our eye care policy on sound current population based data from well designed epidemiologic studies

Around the world successful health policy is based on recent and reliable epidemiologic data and is continually refined on the basis of new epidemiological data.This analysis, strongly suggests increases in the three main causes of sight loss in India. Corneal blindness[post inflammatory and traumatic], congenital in childhood blindness, degenerative/vascular in old age.

Each of these causes has a massive impact on the quality of life of the sight impaired but options for prevention and treatment exists for all of them. Surely in these times of improved technology, now is the time to improve the collection of good quality data on causes of visual impairment and establish an ongoing monitoring system.These can be prevented through health education, behavioural change, improvement in primary health care, genetic counseling, early treatment seeking, adequate intake of food rich in vit-A

Prevention of blindness due to glaucoma is by early detection of occludable angles using slitlamp and gonioscopy and treatment with peripheral iridotomy or iridectomy in open angle adequate examination of optic disc, visual fields and early initiation of therapy[8].

1. These figures can surely be useful as indicators or minimum estimates of the incidence of severe sight loss in the population for planning preventive health care strategies and prioritizing research particularly for irreversible causes.

2. The hierarchy of causes of blindness and visual impairment is highly determined by age.

3. Underuse of ophthalmologic care, ignorance, poverty and illiteracy are the prominent causes of Irreversible blindness.

4. This comprehensive study provides reliable estimates of the causes of permanent blindness and visual impairment in E. G district (India).

5. Despite availability of three tire system of eye care and expanded surgical services, the prevalence of blindness is increasing.

6. Services need to be further expanded and integrated into eye care services, particularly those serving rural populations.

7. The present study results indicate that the incidence of age-related macular degeneration, diabetic retinopathy and maculopathy in India is increasing and can be attributed to higher life expectancy in the general population.

8. Dietary modifications and ensuring adequate availability of vitamin A rich food need to be pursued vigorously[9].

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