International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR |Volume 6 | Issue 4 | Oct - Dec - 2018
www.ijamscr.com

Research article *Medical research*

Ocular manifestations in chronic obstructive pulmonary diseases

Dr. Deepak V.N[1], Dr.Bindu Bhaskaran[2]

[1]*Junior Resident, Department of Ophthalmology, Saveetha Medical College, Thandalam, Chennai, Tamil Nadu, India*

[2]*Senior Resident, Department of Ophthalmology, Saveetha Medical College, Thandalam, Chennai, Tamil Nadu, India*

***Corresponding Author: Dr. Deepak V.N**

Email id: de.kumar555@gmail.com

ABSTRACT

Objective

To study the ocular manifestations such as Cataract, Glaucoma and Age Related Macular Degeneration (ARMD) in Chronic obstructive pulmonary diseases (COPD) patients

Materials and Method

A Retrospective study was conducted during the period from JAN 2018-SEP 2018 which included 100 patients. In all the cases a thorough history was obtained. A detailed ocular and medical history which included the duration of COPD, visual acuity and Slit lamp examination which included anterior and posterior segment examination and intra ocular pressure were recorded.

Result

This study included 100 patients with Chronic Obstructive Pulmonary Disorder who presented with various ocular manifestation. The participants were in the age range of 40-70 years majority of cases were in the age group of 60-69 (40%) years followed by 50-59 (36%) years, 40-49 years (17%) and ≥ 70 years (7%). Ocular manifestations which were presented in majority of COPD cases were Cataract (88.63 %), Glaucoma (6.81 %), followed by ARMD (4.54%)

Conclusion

The result of this study shows that in this case of 100 COPD patients. Males are more commonly affected with majority of age group 60-69 years. And most common ocular manifestation was cataract followed by glaucoma and ARMD with more common in steroid inhalers.

Keywords: Ocular Manifestation, Cataract, Glaucoma, ARMD.

INTRODUCTION

Chronic obstructive pulmonary diseases is a major cause of morbidity and mortality throughout the world due to the changes that occur due to tobacco smoking and steroid use. Chronic obstructive pulmonary disorder produces hypercapnia and hypoxia which may lead to choroidal thinning and also long term use of steroids lead to visual impairment. Ocular disorders

which lead to visual impairment are Cataract, Glaucoma and ARMD.

AIM AND OBJECTIVE

To study the ocular manifestations in COPD and to study the incidence of are Cataract, Glaucoma and ARMD changes in COPD patients.

MATERIALS AND METHOD

This study was conducted during the period from JAN 2018-SEP 2018 which included 100 patients who visited the ophthalmology department of Saveetha Medical College. In all the cases a thorough history was obtained with particular emphasis on the basis of duration of COPD.

PROCEDURE

An informed consent was obtained in every case. A detailed ocular history and medical history which included the duration of COPD and ocular examination which included visual acuity with Snellen's chart and Slit lamp examination which included Anterior and Posterior segment examination, Intra Ocular Pressure, Macular Function Test, Automated Perimetry and OCT were recorded.

Inclusion criteria

The patients included were at an age group of 40-70 yrs and known case of COPD with personal history of smoking.

Exclusion criteria

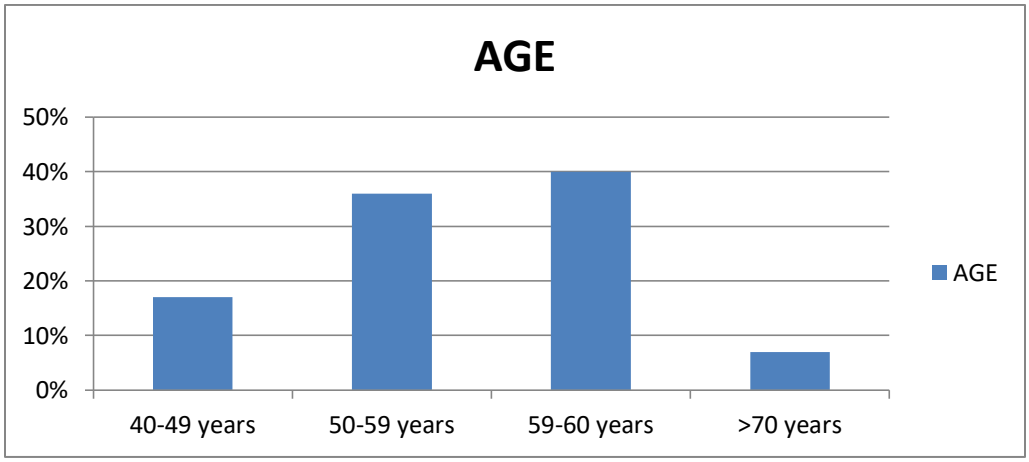
Immuno compromised individuals and patients with corneal opacities were excluded.

RESULT

This study included 100 patients with Chronic Obstructive Pulmonary Disorder who presented with various ocular manifestation during the period of JAN 2018- SEP 2018.In this study the participants were in the age range of 40-70 years majority of cases were in the age group of 60-69(40%) years followed by50-59 (36%) years ,40-49 years (17%) and ≥ 70 years (7%).

Table 1: Age group

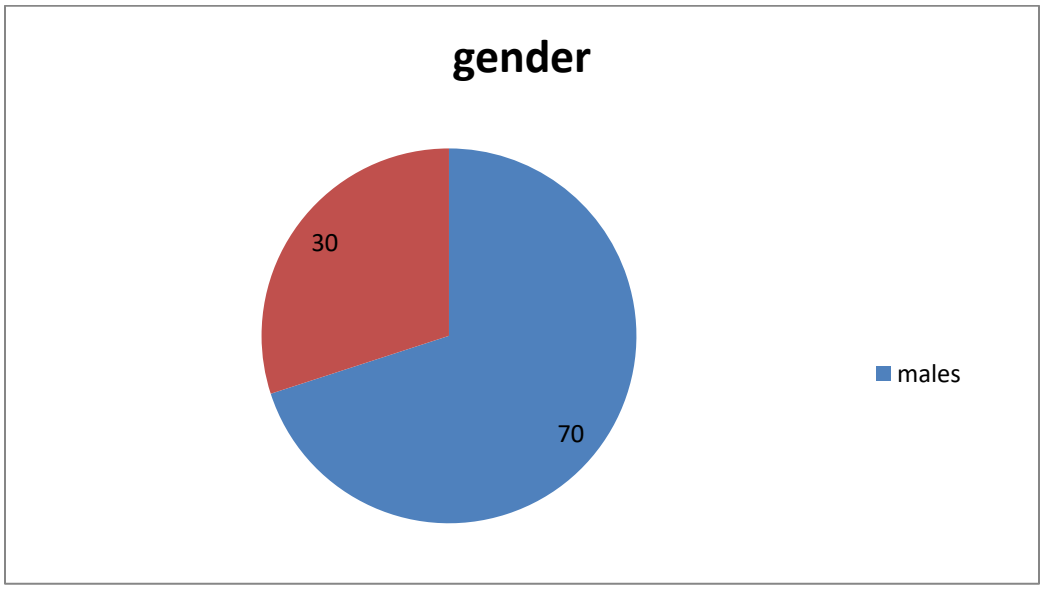
AGE	NUMBER	PERCENTAGE
40-49 YEARS	17	17%
50-59 YEARS	36	36%
60-69 YEARS	40	40%
>70 YEARS	7	7%



Graph No1: Graphic representation of COPD cases according to Age

Table 2: Distribution of COPD cases according to gender

Gender	Number	Percentage
Male	70	70%
Female	30	30%

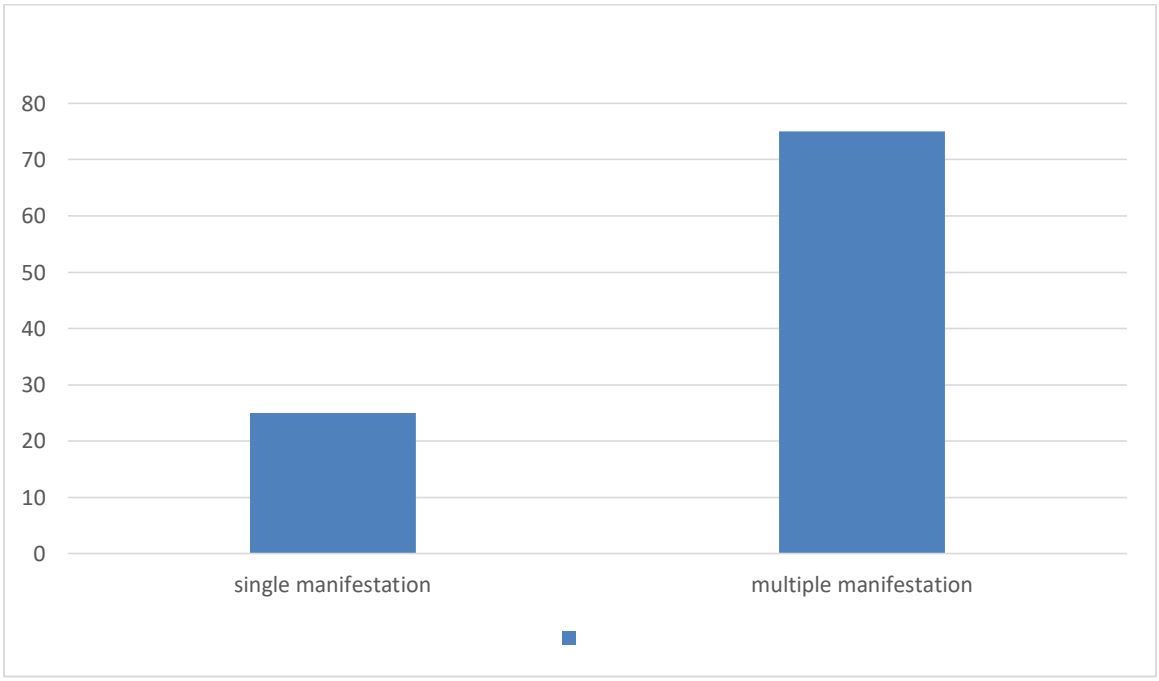


Pie diagram 1: Pie diagrammatic representation according to gender

In the study majority of cases were males (70%) compare to females (30%)

Table 3: Distribution showing single ocular manifestation vs multiple ocular manifestation

Type of ocular manifestation	No of subjects
Single ocular manifestation	25
Multiple ocular manifestation	75

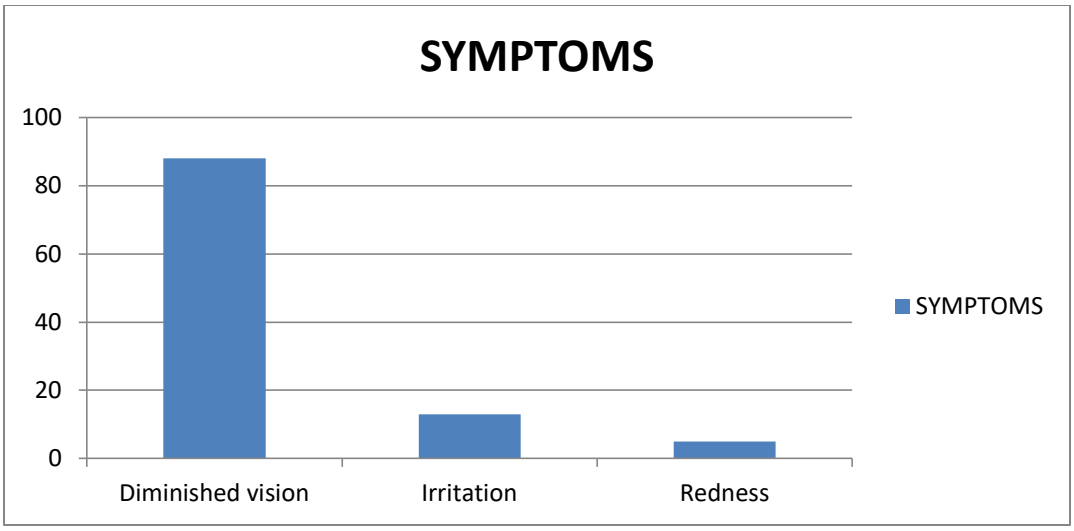


Graph 2: Distribution showing single ocular manifestation vs multiple ocular manifestation

Most of the patients included in the study had shown more than one ocular manifestation

Table no 4: Distribution of COPD cases according to presenting complaint

S.NO	PRESENTING COMPLAINT	NO OF CASES
1	Diminished vision	88
2	Irritation	13
3	redness	5

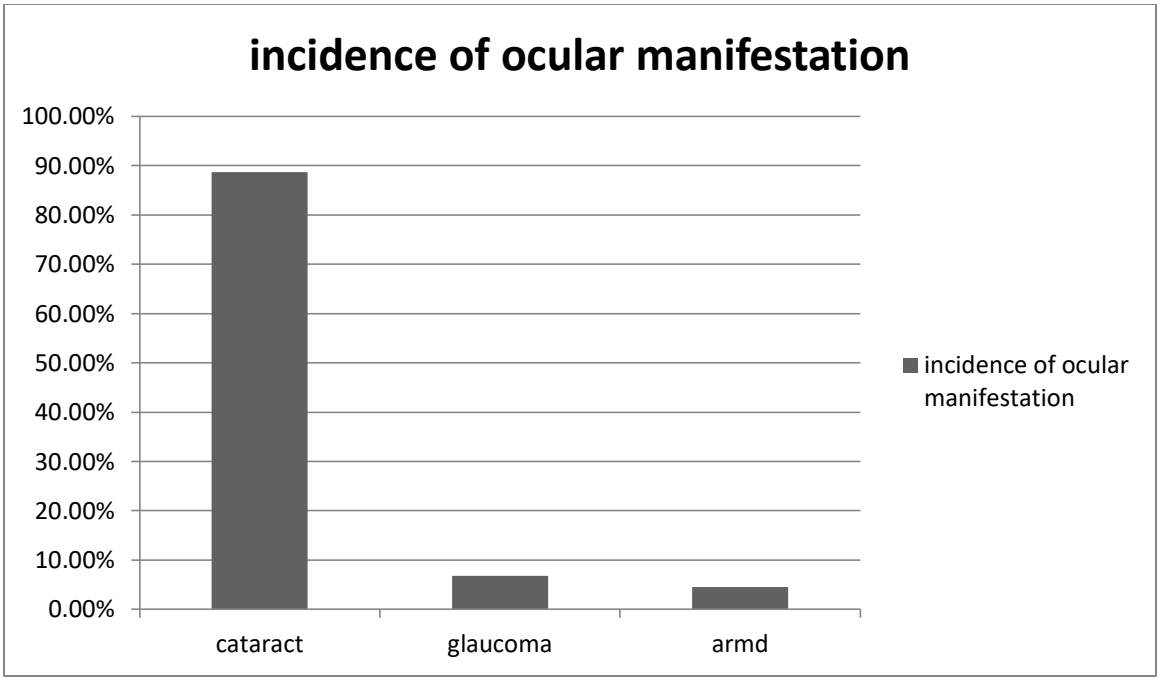


Graph no 3: Graphic representation to presenting complaint

Decreased vision was the common presenting complaint followed by irritation and redness of eyes

Table no 5: Incidence of ocular manifestation

OCULAR MANIFESTATION	NO OF SUBJECTS	PERCENTAGE
CATARACT	78	88.63%
GLAUCOMA	6	6.81%
ARMD	4	4.54%

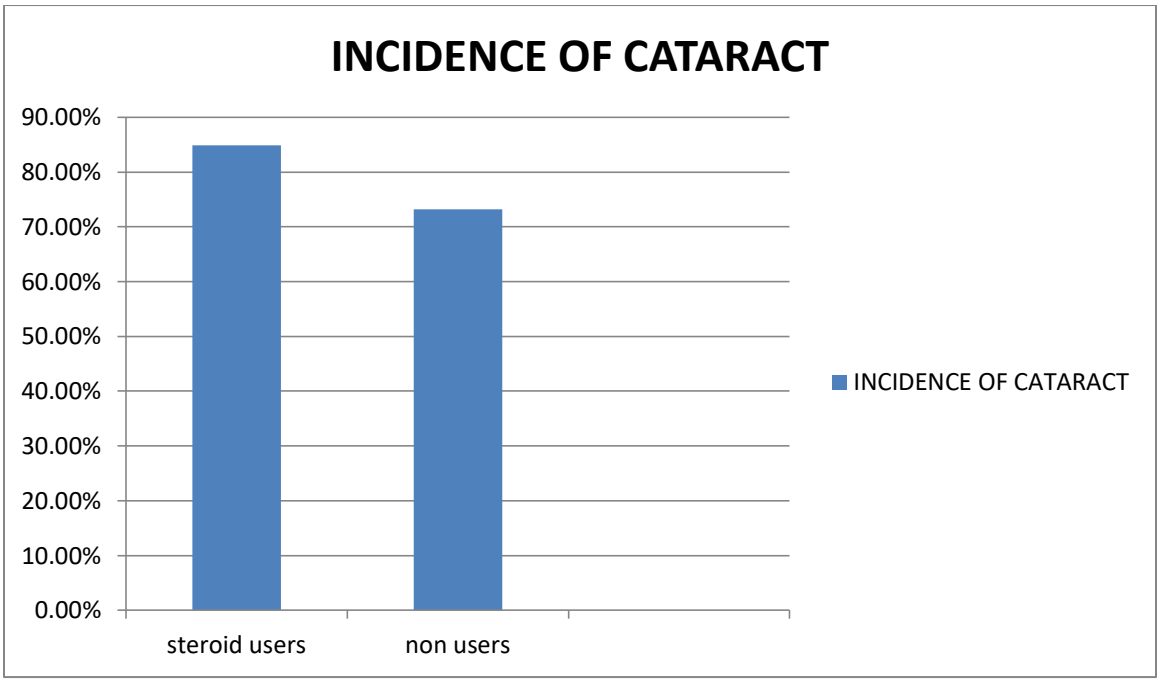


Graph no 4: Graphic representation of ocular manifestation

Ocular manifestation which was presented in majority of COPD cases were CATARACT (88.63 %), GLAUCOMA (6.81 %), followed by ARMD (4.54%)

Table 6: Incidence of cataract in subjects using steroid inhaler vs non users

INHALATIONAL STEROID USERS	NO OF SUBJECTS	NO OF SUBJECTS WITH CATARACT	PERCENTAGE
Yes	44	37	84.09%
No	56	41	73.21%



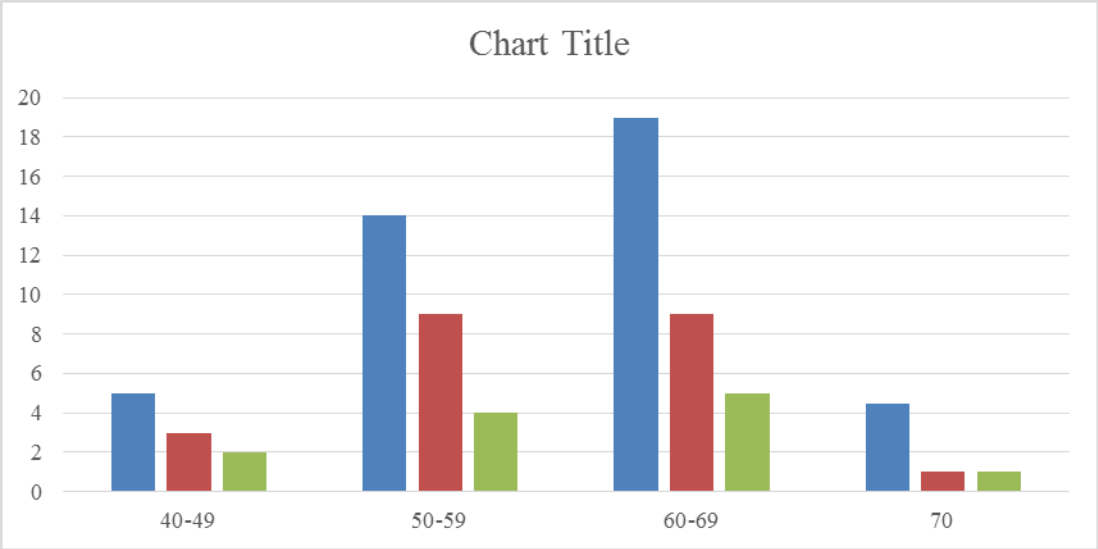
GRAPH 5: Incidence of cataract in subjects using steroid inhaler vs non users

The incidence of cataract in COPD cases using steroid inhalers (84.09%) was more than the subjects who were not using steroid inhalers (73.21%).

Table 7: Incidence of posterior subcapsular cataract vs nuclear cataract vs cortical cataract

AGE GROUP	No OF SUBJECTS	SUBJECTS WITH POSTERIOR SUBCAPSULAR CATARACT	SUBJECTS WITH NUCLEAR CATARACT	SUBJECTS WITH CORTICAL CATARACT
40-49	17	5	3	2
50-59	36	14	9	4
60-69	40	19	9	5
≥70	7	6	1	1

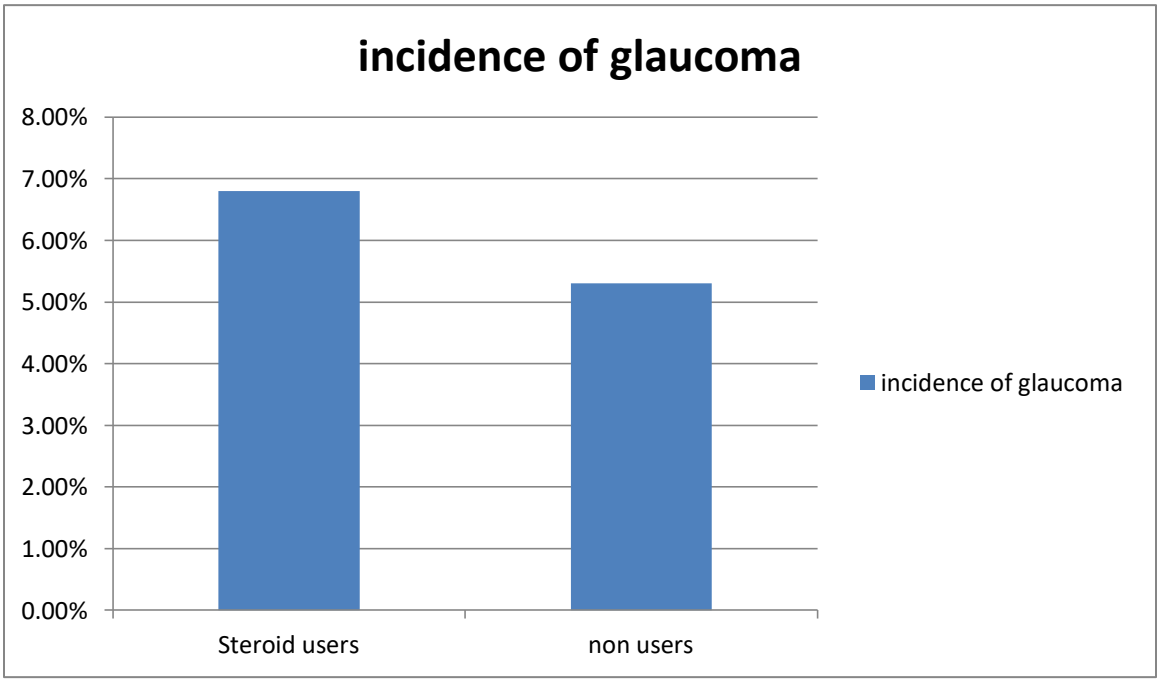
Posterior subcapsular cataract had higher incidence than Nuclear and cortical cataract



Graph 6: Graphic representation of incidence of posterior subcapsular cataract vs nuclear cataract vs cortical cataract

Table NO 8: Incidence of glaucoma in subjects using steroid inhaler vs non inhaler

Inhalational steroid users	No of subjects	No of subjects with glaucoma	Percentage
Yes	44	3	6.8%
no	56	3	5.3%

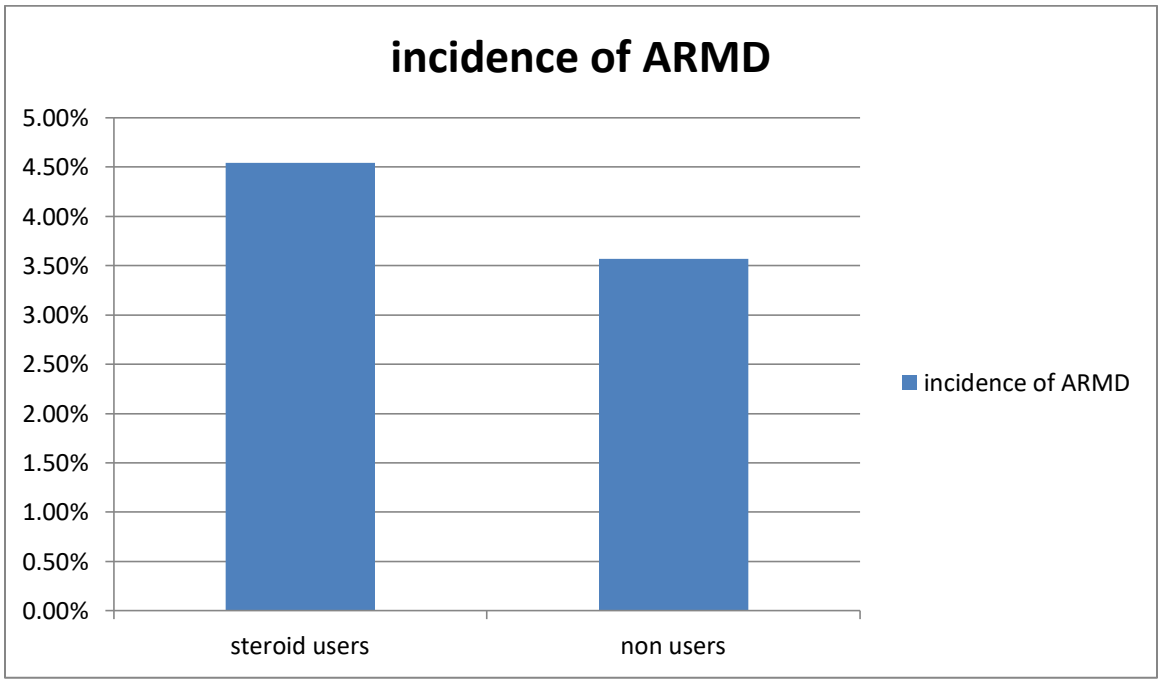


Graph no 7: Graphic representation of Incidence of glaucoma in subjects using steroid inhaler vs non inhaler

Incidence of Glaucoma in COPD subjects using inhalational steroids showed no significant difference between steroid inhalers and non-inhalers

Table NO 9: Incidence of ARMD in subjects using steroid inhaler vs non inhaler

Inhalational steroid users	No of subjects	No of subjects with ARMD	Percentage
Yes	44	2	4.54 %
No	56	2	3.57 %



Graph no 8: Graphic representation of Incidence of ARMD in subjects using steroid inhaler vs non inhaler

In case of ARMD subjects there is no significant difference between steroid inhalers and non-inhalers.

DISCUSSION

In COPD, peripheral airways obstruction, parenchymal destruction and pulmonary vascular abnormalities reduce the lung capacity for gas exchange producing hypoxemia and later on hypercapnia, secondary Erythrocytosis and leukocytosis which contribute to hyperviscosity and an increased risk of thrombosis. These factors further contribute to ischemic and hypoxic environment of the tissue leading to various ocular diseases like Branch retinal vein occlusion and Non arteritic anterior ischemic optic neuropathy

Among the study subjects most common presenting complaint was diminished vision in this study. The incidence of Cataract was (88.63%), Glaucoma (6.81%) and ARMD (4.54%)

CATARACT

The aetiology of cataract is multifactorial and the mechanism of cataract formation is complex. Smoking is just one of many established or putative risk factors for cataract which also include age, trauma, intra ocular inflammation, ultraviolet radiation, diabetes mellitus and prolonged corticosteroid inhalation. [1]

Additional oxidative stress on the lens by nicotinamide and reduction of the level of nutrients such as ascorbic acid are caused by smoking [2]

Direct and structural lens injury may be caused by components of cigarette smoke [3]

Several prospective studies such as Hankinson et al [4] have investigated the relationship between cataract formation and cigarette smoking

Smoking was also strongly associated with posterior subcapsular opacities [5]

There is a growing consensus that smoking increases the risk of nuclear cataract and cortical cataract has also been reported [6]

Cumming et al found increased risk of posterior subcapsular cataract was associated with cumulative life time doses of Beclomethosone [7]

GLAUCOMA

The evidence of involvement of primary open angle glaucoma is controversial. While several studies have indicated a strong association between smoking and Glaucoma, others have failed to do so There is a weak co- relation between smoking and intra ocular pressure [8]

A recent population based study in West indies has shown that smoking is associated with a slightly higher intra ocular pressure [9]

A case control study has shown that cigarette smokers are more prone to glaucoma than non smokers [10] On the contrary another population based study has shown no difference in the frequency of glaucoma based on cigarette smoking [11]

ARMD

Recent studies account the prevalence of ARMD among 70 years and above as 2% and 3.7% was comparable to western countries [12, 13]

Three population based studies the Beaver Dam Eye Study [14], Blue Mountain Eye Study [15] and the Rotterdam Study [16] report the prevalence rates to be 1.7% in US, 1.4% in Australia and 1.2% in Netherland

Incidence in Indian population is 1.82% in the Andhra Pradesh Eye Diseases Study and Jain et al study from North India report the prevalance rate to be 4.7% [17]

BOSS cohort found a prevalence of ARMD of 3.4%. A history of current smoking and number of pack and years smoked were associated with early ARMD [18]

The Eye Diseases Case Control Study found a association between incidence of ARMD and smoking [19]

Smoking is one of the most consistently modifiable risk factor by majority of workers. Strong history of smoking was present in all ARMD cases in a recent study from Europe, Australia and America

The damage could be directly through oxidative stress by promotion of atherosclerosis or by decrease in macular pigment density

LIMITATION

It was a cross sectional study. Above diseases are multifactorial diseases and as we did not study all other confounding factors such as presence of diabetes, exposure to sunlight and diet we may have underestimated the adjusted effect of smoking on the risk of cataract

CONCLUSION

The result of this study shows that in this case of 100 COPD patients. Males (70%) are more commonly affected with majority of age group 60-69 years (40%). And most common ocular manifestation was Cataract (88.63%) followed by Glaucoma (6.81%) and ARMD (4.54%) Posterior subcapsular cataract had more incidence than nuclear and cortical cataract. Incidence of cataract, glaucoma and ARMD was more common in steroid inhalers (84.09%, 6.8%and 4.545).

REFERENCE

[1]. Skalka HW, Prchal JT. Effect of corticosteroids on cataract formation. Archives of Ophthalmology. 98(10), 1980, 1773-7.

[2]. Taylor A, Jacques PF, Epstein EM. Relations among aging, antioxidant status, and cataract. The American journal of clinical nutrition. 62(6), 1995, 1439S-47S.

[3]. Shalini VK, Luthra M, Srinivas L, Rao SH, Basti S, Reddy M, Balasubramanian D. Oxidative damage to the eye lens caused by cigarette smoke and fuel smoke condensates. Indian journal of biochemistry & biophysics. 31(4), 1994, 261-6.

[4]. Hankinson SE, Willett WC, Colditz GA, Seddon JM, Rosner B, Speizer FE, Stampfer MJ. A Prospective Study of Cigarette Smoking and Risk of Cataract Surgery in Women. Journal of Occupational and Environmental Medicine. 35(3), 1993, 245-50.

[5]. Christen WG, Manson JE, Seddon JM, Glynn RJ, Buring JE, Rosner B, Hennekens CH. A prospective study of cigarette smoking and risk of cataract in men. Jama. 268(8), 1992, 989-93.

[6]. Nirmalan PK, Robin AL, Katz J, Tielsch JM, Thulasiraj RD, Krishnadas R, Ramakrishnan R. Risk factors for age related cataract in a rural population of southern India: theAravind Comprehensive Eye Study. British journal of ophthalmology. 88(8), 2004, 989-94.
[7]. Cumming RG, Mitchell P, Leeder SR. Use of inhaled corticosteroids and the risk of cataracts. New England Journal of Medicine. 337(1), 1997, 8-14.
[8]. Carel RS, Korczyn AD, Rock M, et al. Association between ocular pressure and certain health parameters. Ophthalmology. 91(4), 1984, 311-4.
[9]. Wu SY, Leske MC. Associations with intraocular pressure in the Barbados Eye Study. Archives of ophthalmology. 115(12), 1997, 1572-6.
[10]. Wilson MR, Hertzmark E, Walker AM, Childs-Shaw K, Epstein DL. A case-control study of risk factors in open angle glaucoma. Archives of ophthalmology. 105(8), 1987, 1066-71.
[11]. Klein BE, Klein R, Ritter LL. Relationship of drinking alcohol and smoking to prevalence of open-angle glaucoma: the Beaver Dam Eye Study. Ophthalmology. 100(11), 1993, 1609-13.
[12]. Nirmalan PK, Katz J, Robin AL, et al. Prevalence of Vitreoretinal Disorders in a Rural Population of Southern India: The Aravind Comprehensive Eye Study. *Arch Ophthalmol*. 122(4), 2004, 581–586. doi:10.1001/archopht.122.4.581
[13]. Krishnaiah S, Das T, Nirmalan PK, Nutheti R, Shamanna BR, Rao GN. Prevalence of vitreoretinal disorders in a rural population of southern India: The Aravind Comprehensive Eye Study. Invest Ophthalmol Vis Sci. 46(12), 2005, 4442-9.
[14]. Klein R, Klein BE, Linton KL. Prevalence of age-related maculopathy: the Beaver Dam Eye Study. Ophthalmology. 99(6), 1992, 933-43.
[15]. Mitchel P, Smith W, Altebo K. Prevalence of agerelated maculopathy in Australia: The Blue Mountain Study. Ophthalmology. 102, 1995, 1450-60.
[16]. Vingerling, J. R., Dielemans, I., Hofman, A. The prevalence of age-related maculopathy in the Rotterdam Study. *Ophthalmology*, *102*(2), 1995, 205-210.
[17]. Jain IS, Prasad P, Gupta A,et al . Senile macular degeneration in northern India. Indian journal of ophthalmology. 32(5), 1984, 343.
[18]. Klein, Ronald, Karen J. Cruickshanks, Scott D. Nash et al, "The prevalence of age-related macular degeneration and associated risk factors." *Archives of ophthalmology* 128(6), 2010, 750-758.
[19]. Eye Disease Case-Control Study Group. "Risk factors for neovascular age-related macular degeneration." *Arch Ophthalmol* 110, 1992, 1701-1708.

How to cite this article: Dr. Deepak V.N, Dr.Bindu Bhaskaran. Ocular manifestations in chronic obstructive pulmonary diseases. Int J of Allied Med Sci and Clin Res 2018; 6(4): 940-948.
Source of Support: Nil. **Conflict of Interest:** None declared.