

Prevalence Of Hypertension And Diabetes Mellitus Among People Seeking Cataract Surgery In Rural South India.

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Abstract

Objective: To know the prevalence of hypertension and diabetes mellitus among people seeking cataract surgery in the rural population. **Study**

Design: Cross sectional study. **Setting:** Study was carried out at G.S.L. Medical College & General Hospital, Rajahmundry, Andhra Pradesh, India. **Participants:** Cases of cataract requiring surgery. **Methodology:** People were screened for cataract at village level eye camps and an ophthalmology outpatient department. The study group consisted of diagnosed cases of senile cataract, who were admitted to the hospital for surgery. All the cases were screened for hypertension and diabetes mellitus before surgery. **Statistical Analysis:** Percentages, Z-test, & chi-square test. **Results:** Out of 1627 cases, 49% were male and 51% were female. The prevalence of hypertension & diabetes mellitus was 20.59% & 5.9% respectively. Among 795 male cases, 13.8% have hypertension, whereas the prevalence of diabetes mellitus was 4.7%. The prevalence of hypertension & diabetes mellitus among 832 female cases was 24.5% and 4.4% respectively. **Conclusions:** Chronic diseases like hypertension and diabetes are usually present among cataract cases. Early detection and proper control will greatly delay the development and progress of complications

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INTRODUCTION

Hypertension and diabetes mellitus are both iceberg diseases. Hypertension is the most common cardiovascular disorder, which poses a major public health challenge. It is one of the greatest risk factors for cardiovascular mortality.¹ An analysis of worldwide data shows that one billion adults had hypertension in the year 2000, and it has been predicted to increase up to 1.56 billion by 2025.² Similarly, diabetes mellitus cases are estimated to be 150 million and this has been predicted to double by 2025, with the greatest number of cases expected to be in China and India.³

Globally, cataracts remain the leading cause of blindness, affecting approximately 18 million people.⁴ It has been observed that the prevalence of cataract is higher among developing nations in Africa, Asia, & Latin America.⁵ This occurrence is even greater in rural communities.⁶ The prevalence of cataract in South India is 53%.⁷ Cataracts are 2-5 times more frequent in diabetic patients and occur at an earlier age, thus the visual loss has a significant impact on

the working population.^{8,9} Fluctuating levels of sorbitol, fructose and glucose exert harmful osmotic stresses within the lens, so control of the diabetes would help to prevent the fluctuations.¹⁰ It has been estimated that 20% of all cataract surgeries are performed on diabetic patients,¹¹ with a surgical rate of 3,400 adults per one million per year in India.¹²

Like diabetes, systemic hypertension was found to significantly increase the risk for posterior sub-capsular cataracts. Hypertension induces changes in the protein conformational structures in the lens capsules, subsequently causing alterations in membrane transport and permeability of ions, and finally increasing intraocular pressure, resulting in exacerbation of cataract formation.¹³ The prevalence of hypertension is high, both in urban & rural population in India.^{14,15}

Since cataract is a leading cause of blindness, modifiable risk factors like hypertension, diabetes mellitus, obesity, smoking, and alcohol use should be treated to reduce the incidence of cataract.¹⁶ Hence, an early detection of hypertension and diabetes mellitus in cataract patients will help in prevention of severe complications. This study was

conducted to examine the prevalence of hypertension and diabetes mellitus among people seeking cataract surgery in the rural population.

MATERIAL & METHODS

This cross-sectional study was carried out in the department of ophthalmology in collaboration with the Department of Community Medicine at GSL Medical College and General Hospital, Rajahmundry, Andhra Pradesh. Study subjects were cataract cases who were admitted to the hospital for surgery after screening at eye camps and ophthalmology OPD. A total of 1627 cases of both sexes, admitted to the hospital for cataract surgery between June 2006 and May 2007, were considered for the study. After admission to the hospital, a detailed history was taken and thorough clinical examination was performed. Emphasis was placed on a history of hypertension and diabetes mellitus, duration of the disease, and medications. Blood pressure was measured by mercury Sphygmomanometer (Diamond® Deluxe) and a stethoscope (Microtone®). Cases with systolic blood pressure ≥ 140 mm of Hg and/or diastolic blood pressure ≥ 90 mm of Hg on two separate occasions were considered hypertensive.¹⁷ Appearance of Korotkoff sound was taken as the systolic blood pressure (SBP) and disappearance was taken as the diastolic blood pressure (DBP). Cases with histories of hypertension, regardless of present blood pressure level, were also considered hypertensive. Blood sugar was estimated in the ERBA-EM-360 fully automated auto analyzer in the hospital central laboratory. Blood samples were collected in morning from the patients under all aseptic measures after overnight fasting and 2 hours post-prandial. Patients with FBS ≥ 126 mg/dl and/or post-prandial ≥ 200 mg/dl were considered diabetic.¹⁸ Known diabetic persons, regardless of their current blood sugar level, were considered diabetic, along with newly detected diabetic persons. Cases with visual impairment due to the corneal disorders, glaucoma, lens abnormalities other than cataract, vitreous disorders and retinal disorders were excluded from this study.

The cases were divided into four groups

Prior to starting the study, ethical approval was obtained from the institutional ethical committee of GSL Medical College & General Hospital, Rajahmundry, Andhra Pradesh. Informed consent was taken from all study participants before enrolling them into study. The data collected were entered in a MS-Excel spreadsheet and analyzed using the SPSS (version 17.0).

RESULTS

Out of 1627 cataract cases, 51% were females. The mean age was higher among cataract cases with hypertension, while mean age was lower in cataract cases with diabetes (Table-1). In Group A, it was observed that 81.38% male cataract cases did not have either hypertension or diabetes, whereas in females it was 71.03%. In our study, 20.59% of cases had hypertension, 5.9% cases had diabetes and 1.29% of cases had both hypertension and diabetes. The prevalence of hypertension was greater among female, whereas prevalence of diabetes was more in males. Amongst non-hypertensive groups (Groups A & C), cases with diabetes (Group C) had higher blood pressures in comparison to the non-diabetic group (Group A). Similarly, in non-diabetic groups (Group A & B), cases with hypertension (Group B) show higher blood sugar levels (both FBS & PPBS) than normal cases (Group A). Group D cases have higher blood sugar levels compared to Group C.

Figure 1

Table-1: Comparison of Age, Sex, Blood Pressure & Blood Sugar among normal, hypertensive and diabetic cases. (N= 1627)

Parameters	Group A n=1238	Group B n= 314	Group C n=75	Group D n=21
Age (in Years)	58.12±9.78	61.13±8.29	55.16±9.25	61.71±7.11
Sex				
Male	647(81.38%)	110(13.84%)	38(4.78%)	9(1.13%)
Female	591(71.03%)	204(24.52%)	37(4.45%)	12(1.44%)
Hypertension				
SBP	119.39±12.38	159.06±17.59	129.44±21.84	155.71±13.63
DBP	75.09±7.78	95.58±8.12	80.99±11.88	96.19±7.4
In mm of Hg				
Diabetes Mellitus				
FBS	82.79±8.49	89.00±31.14	175.44±55.82	183.43±65.62
PPBS	121.77±10.94	132.85±45.71	266.84±81.60	277.05±90.21
In mg/dl				

(The values in table indicate mean ± S.D.)

DISCUSSION

Cataract is one of the most significant problems in India. According to the National survey on blindness (2001-2002), there is an annual incidence of two million cataract-induced blindness in India.¹ Two-fifths of all global blindness are caused by cataract.¹⁹ Cataract is usually seen above 50 years of age and almost universal in varying degrees in persons above 70 years. Persons with some metabolic disturbances such as diabetes develops cataract at younger age.²⁰ Cataract

progresses faster in diabetes. The complications of cataract surgery are greater in hypertensive cases. In the present study, the mean age is 58.12 years and 55.16 years in persons without diabetes and with diabetes, respectively. This finding is statistically significant ($P=0.01$) and correlate with the above study. Incidence of cataract is equal in both sexes.^{20,21} There was no significant sex predilection with males or females in our study.

Sabanayagam C. et al found a significant increase in incidence of cataract with diabetes and hypertension (OR [95%CI] = 4.73[2.16-10.34]).²² Prevalence of hypertension among cataract cases was 20.59% in our study. Studies in different parts of world show different prevalence rates, in Chandigarh, India 4.1%²³, in Erode, India 7.82%²¹ and in Karachi, Pakistan 43.75%.²⁴ In the present study, the prevalence of diabetes among cataract cases was 5.9%. Our findings are consistent with other studies in India.^{21,23} Patients with diabetes have a higher prevalence of lens opacities²⁵ and develop cataract at a younger ages than non-diabetic patients.²⁶ The prevalence of cases having both diabetes and hypertension were 1.29% in our study. Studies by Venkateswaramurthy N et al²¹ and Shakil M et al²⁴ show prevalence rates of 11% and 15%, respectively.

The prevalence of hypertension was significantly higher among females ($P<0.001$). Although the prevalence of diabetes was more among males, it was not statistically significant ($P>0.05$). Though mean systolic blood pressure was greater in cases of hypertension without diabetes, the mean diastolic blood pressure was greater in cases of hypertension with diabetes. However, this difference was statistically not significant. The mean FBS and PPBS was significantly more among cases with both diabetes and hypertension in comparison to cases with diabetes only.

As the cases were not selected randomly and majority of cases were screened from camp, the study sample may not be the representative of general population. The intra-operative and post-operative complications are more in uncontrolled diabetes and hypertension. The complications are still high in cases with both diabetes and hypertension. To avoid such complications, early detection and good control of both blood sugar and blood pressure are prerequisites.²⁷ Early detection of diabetes and hypertension among cataract cases and their proper control will greatly delay the development and progress of complications.

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