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Ophthalmology

OCULAR ABNORMALITIES IN PATIENTS WITH CHRONIC RENAL FAILURE ON HAEMODIALYSIS

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ABSTRACT

Introduction :- Chronic renal failure is an irreversible and progressive process that results in end stage renal disease where patients have to be dependent on replacement therapy for survival. Two most common causes of CKD progressing to end stage renal disease are hypertension and diabetes mellitus. Most vision threatening changes CKD are diabetic and hypertensive retinopathies. The GOAL of our study was to evaluate the ocular abnormalities in chronic kidney disease patients undergoing haemodialysis.

Materials & Methods :-In our study we included the patients attending ASRAMS Hospital for dialysis over a period of 6 months (10-09-2017 to 10-03-2018). All the patients were subjected to following tests -snellens chart for visual acuity,Refraction for BCVA wherevereeded,Intraocular pressure measurement,slit lamp biomicroscopy,fundus evaluation post dilatation with 90D/D.O.

Results :- A total of 312 patients were studied during this period. Among those patients major causes for visual impairment were hypertensive retinopathy followed by cataract, diabetic retinopathy, glaucomatous optic neuropathy and age related macular degeneration

Conclusion :- Our study shows significant prevalence of hypertensive retinopathy, diabetic retinopathy and glaucomatous changes. While ocular calcification was noted only in 7 patients. Hence regular ophthalmic evaluation should be done in patients undergoing dialysis to prevent visual morbidity which is mainly secondary to retinopathy

KEYWORDS : chronic renal failure, chronic kidney disease, hypertensive retinopathy, diabetic retinopathy, dialysis, ocular calcification.

INTRODUCTION :- Chronic renal disease, or chronic kidney failure, is a slow progressive loss of renal function over a period of several years. Chronic kidney disease goes unnoticed and undiagnosed until the disease is well advanced and kidney failure occurs. As kidney failure advances and the organs function are seriously impaired, the patient will not survive without dialysis or a kidney transplant. The study of ocular findings in CRF patients undergoing hemodialysis[1] can reduce the ocular morbidity. The chronic diseases that can result in progressive renal damage include Diabetes, Hypertension, Kidney diseases (Polycystic kidney, pyelonephritis or glomerulonephritis, renal stones, renal arterial stenosis and tumors), Certain toxins(Certain solvents such as carbon tetrachloride, and lead), Systemic lupus erythematosis, Malaria and yellow fever, Wegener's Granulomatosis, Overuse of NSAIDs such as aspirin and brufen can also cause renal failure.

Some of the most common eye problems that occur in CKD patients are :

Anterior segment: Lid oedema, conjunctival pallor; and xanthalasma due to increased serum lipids. Corneal and conjunctival calcification due to secondary hyperparathyroidism. Cohen Etal explained the association of pingecula with CRF. Its due to degenerative changes in the conjunctiva in CRF.[2] Inflammatory reactions of conjunctiva and episclera due to marked rise in serum calcium.[3-5] Cataract due to metabolic changes and calcium deposits in the lens.

Posterior segment: Retinopathy, central retinal vein occlusions, branch retinal vein occlusions, central retinal artery occlusions, disc oedema and glaucomatous optic atrophy were noted in CRF patients. Retinopathy is a condition where changes in retinal blood vessels causes bleeding and distort vision. Retinopathy is often asymptomatic in its early stage. Delay in diagnosis can result in significant loss of vision. Hypertensive retinopathy changes can be severe in CRF. The fundus findings can reflect the efficacy of antihypertensive drugs. Thus the retina findings may be of help to monitor status of blood pressure control.[6] The condition of the eye reflects the control of the blood sugar levels and in turn the progress of the disease. This study shows the ocular status and complications associated with chronic renal failure.[7-10] Schmechel H Etal studied the frequency of retinopathy in diabetic nephropathy in patients treated with insulin.[11] Diabetic retinopathy worsens with reduced renal function and poor control of hypertension.[12,13]

One of the most important complication of chronic renal failure is disturbance of mineral metabolism, i.e. secondary hyperparathyroidism. Common feature of mineral metabolism disturbance in CRF is soft tissue calcification. The pathogenesis of this calcification is not completely understood but ocular calcifications are among the most frequently observed. Glaucoma is one of most important cause of blindness worldwide and it is important to observe IOP in dialysis patients especialy in patients with glaucoma. Posterior eye segment pathology, according to main causes of CRF, could be hypertensive vascular changes and diabetic retinopathy[14-15].

MATERIALS :-In our study we included the patients attending ASRAMS Hospital for dialysis for more than an year. Patients are examined over a period of 6 months from 10th september 2017 to 10 march 2018.

Study design- 6 months cross-sectional study.
Type of study-Descriptive, non interventional, hospital based study.

Method of collection of data
Source of Data - Haemodialysis Unit at Alluri sitarama raju academy of medical sciences and research, AndraPradesh.

Sample size - A sample size of 312 cases.

Sampling procedure - The sample size was calculated considering prevalence of ocular signs in CRF patients on dialysis reported in a similar descriptive study.

Selection of patients -
Inclusion Criteria
- CRF patients aged between 25 years to 70 years.
- Previously diagnosed patients of diabetes mellitus, hypertensive, dyslipidemia and associated ophthalmic diseases.
- Severe chronic renal failure patients and end stage renal disease on hemodialysis.

Exclusion Criteria
- Patients aged below 25 years
- Hereditary causes of CRF
- Reversible causes of renal failure
- Patients with renal transplants

Procedure - The study is conducted in Department of Ophthalmology at ASRAMS for a duration of 6 months. The study was approved by the Ethical and Research Committee, Alluri sitarama raju academy of

medical sciences and research, Eluru, West godavari, Andhra Pradesh. After finding the suitability as per inclusion and exclusion criteria patients were selected for the study and briefed about the nature of the study, and written informed consent was obtained.

Further, descriptive data of the participants like name, age, sex, detailed history, were obtained by interviewing the participants and clinical examination and necessary investigations were recorded on predesigned and pretested proforma

METHODS : A valid consent is taken from the patient before starting ophthalmic evaluation.

All the patients were subjected to following tests :
1. Snellens chart for visual acuity.
2. Refraction for BCVA wherever needed
3. Intraocular pressure measurement
4. Slit lamp biomicroscopy
5. Fundus evaluation post dilatation with 90D/D.O

STATISTICAL ANALYSIS :- Microsoft office 2007 was used to make tables. Descriptive statistics using mean and percentage were used to interpret results of the study.

RESULTS :-

GENDER

Males	Females
57.70% (180)	42.30% (132)

AGE :

Age group	Percentage (No. of patients)
25-35	2.88% (9)
35-45	5.45% (17)
45-55	35.58% (111)
>55	56.09% (175)

VISION – BCVA-BEST EYE

WHO Criteria	Visual acuity	Number	Percentage
GOOD	6/6-6/18	123	39.41%
IMPAIRED	6/24-6/60	86	27.56%
LEGALLY BLIND	<6/60 PL +/-	94 9	30.12% 2.88%

OCULAR FINDINGS

OCULAR FINDINGS	NUMBER OF PATIENTS	PERCENTAGE
PTERYGIUM/PINGUECULA	94	30.12%
CATARACT	132	38.00%
CALCIFICATIONS	7	2.24%
DIABETIC RETINOPATHY	97	31.08%
HYPERTENSIVE RETINOPATHY	172	55.12%
GLAUCOMATOUS OPTIC NEUROPATHY	10	3.20%
BRVO	3	0.96%
ARMD (DRY/WET)	17	5.44%
NORMAL	36	11.53%

DIABETIC RETINOPATHY

STAGE	NUMBER OF PATIENTS	PERCENTAGE
NPDR	60	19.23%
PDR	20	6.41%
MACULOPATHY	17	5.44%

HYPERTENSIVE RETINOPATHY

STAGE	NUMBER OF PATIENTS	PERCENTAGE
1 OR 2	71	22.75%
3	94	30.12%
4	7	2.24%

CAUSE OF VISUAL IMPAIRMENT

UNDERLYING CAUSES	NO. OF PATIENTS	PERCENTAGE
CATARACT	132	42.30%
<NC2C2	72	23.07%
>NC2C2	60	19.23%
HTN RETINOPATHY	172	55.12%
DIABETIC RETINOPATHY /MACULOPATHY	97	31.08%
GLAUCOMATOUS OPTIC NEUROPATHY	10	3.20%
ARMD	17	5.44%
OTHERS	17	5.44%

DISCUSSION :-

AGE & GENDER :

The mean age of the patients in our study was 52.31 years with most affected age group being above 55 years i.e 56.09% followed by age group 45-55 years i.e 35.58% and less affected age group being 25-35 i.e 2.88% with male predominance 57.70%(180 patients).

OCULAR FINDINGS :

The prevalence of various ocular findings like conjunctival degenerations, cataract and ocular calcifications were significantly higher in patients with chronic kidney disease undergoing dialysis when compared to normal population.

DIABETIC RETINOPATHY : The occurrence of diabetic retinopathy affecting functional vision in patients with CKD undergoing haemodialysis was higher when compared to population with diabetes and without CKD. Of all 312 patients in our study 60 patients i.e 19.23% had various stages of NPDR, 20 patients i.e 6.43% had PDR and 17 patients i.e 5.44% had maculopathy including the patients who underwent photocoagulation.

HYPERTENSIVE RETINOPATHY : In the patients undergoing dialysis for CKD, the prevalence of hypertensive retinopathy was more compared to diabetic retinopathy and hypertensive retinopathy in normal population with probable cause being secondary hypertension which is due to chronic kidney disease. 71 patients i.e 22.75% patients had grade 1or 2 hypertensive retinopathy, 94 patients i.e 30.12% patients had grade 3 hypertensive retinopathy and 7 patients i.e 2.24% patients had grade 4 hypertensive retinopathy. Hypertensive retinopathy stands as leading cause for visual morbidity in patients with CKD undergoing dialysis.

GLAUCOMA : Various studies demonstrate the increased prevalence of glaucoma in diabetes and other systemic diseases, similarly the prevalence of glaucomatous optic neuropathy changes in patients undergoing dialysis was 3.20% i.e 10%.

ARMD : In our study, 17 patients i.e 5.44% had age related macular degeneration changes which may accounted for the major age group in our study being above 55 years

OCULAR CALCIFICATIONS : Only few studies focussed on the ocular calcifications in patients undergoing dialysis which may be contributed to secondary parathyroidism. In our study 7 patients (2.24%) had ocular calcifications which were not sight threatening.

CONCLUSION :

This is cross-sectional hospital based study reporting prevalence and underlying cause of visual morbidity in the patients with CKD undergoing haemodialysis. Ocular morbidity was significantly higher compared to normal population contributing to increased prevalence of hypertensive retinopathy, diabetic retinopathy, glaucoma etc. Hence regular periodic ophthalmic evaluation is recommended in patients with CKD undergoing haemodialysis.

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