



OCULAR FINDINGS IN CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING HEMODIALYSIS AT TERTIARY CARE HOSPITAL, KADAPA

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ABSTRACT **Introduction:** Chronic renal failure is an irreversible disease and requires dialysis or renal transplantation for survival of the patient. It affects every organ system of the body. **Aim:** The aim of our study is to find out the ocular manifestations in chronic renal failure patients undergoing hemodialysis. **Material And Methods:** This study was conducted in Tertiary Care hospital, kadapa, over a period of 12 months i.e. from 03-08-2022 -03-08-2023. Total 200 patients with chronic renal failure undergoing haemodialysis (80 females and 120 males) aged 23- 68 years (mean age of 45) were examined. Complete ocular examination with visual acuity, IOP, Slit lamp biomicroscopic examination and funduscopy and fundus photography was done. Positive anterior and posterior segment findings were noted. **Results:** Visual acuity ranging from 6/6 to perception of light was found in both the eyes. IOP was between 14 – 20 mm Hg in both the eyes. Out of 400 eyes of 200 patients Pterygium was found in 24 (24%) patients, pingecula in 8 patients (8%), conjunctival congestion in 12 patients (12%) and cataracts in 70 patients (70%). Hypertensive Retinopathy was found in 96 patients (96%) of various stages ranging from stage 1-4 of Keith Wegener's classification and BRVO in 2(2%) patient. Diabetic retinopathy was found in 66 patients (66%), 40 with NPDR (40%), and PDR in 16 patients (16%), diabetic maculopathy in 10 patients (10%). Glaucomatous optic atrophy in 40 patients (40%). **Conclusion:** Chronic kidney disease is a progressive disease and goes undetected and undiagnosed until disease is advanced. Diabetes and Hypertension are the leading causes for renal failure. Most common vision threatening problems in CRF are retinopathy and cataract. Hence it is mandatory to screen all the patients with renal failure to prevent loss of vision.

KEYWORDS :

INTRODUCTION

The study of ocular findings in CRF patients undergoing hemodialysis can reduce the ocular morbidity

The following chronic diseases can result in progressive renal damage:

- 1) Systemic disorders : Diabetes mellitus
- 2) Vascular disorders : Hypertension
- 3) Kidney diseases- Polycystic kidney, pyelonephritis or glomerulonephritis, renal stones, renal arterial stenosis and tumours.
- 4) Certain toxins- Certain solvents such as carbon tetrachloride, and lead (and lead-based paint, pipes, and soldering materials) are toxic to the kidneys. Some types of jewellery have toxins which can lead to chronic kidney failure.
- 5) Autoimmune disorders : Systemic lupus erythematosus, Sarcoidosis, Sjogren's disease, Behcet's syndrome, Vasculitis
- 6) Malaria and yellow fever
- 8) Drugs - Overuse of NSAIDs such as aspirin and brufen can cause renal failure
- 9) Infectious diseases : Tuberculosis

GFR refers to how many milliliters (ml) of waste the kidneys are able to filter per minute. Normal kidneys can filter waste of 90 ml – 120 ml / minute. GFR rate can give an estimate of the progression of the kidney disease. In ESRD the patient requires dialysis or renal transplantation. Dialysis is a process where the blood moves across the membranes in the dialyser that filters the waste and excess water and again returned to the patient vein.

Some Of The Most Common Eye Problems That Occur In CKD Patients

Anterior Segment:

Lid oedema, conjunctival pallor, and xanthlasma due to increased serum lipids. Corneal and conjunctival calcification due to secondary hyperparathyroidism. Cohen et al explained the association of pingecula with CRF. It's due to degenerative changes in the conjunctiva in CRF. Goblet cell density is decreased. Recurrent subconjunctival haemorrhage can occur due to sclerosed conjunctival vessels secondary to hypertension. Inflammatory reactions of conjunctiva and episclera due to marked rise in serum calcium. Raising of intracellular calcium cause early cataract formation and deposition of calcium in lens.

Posterior Segment:

Retinopathy, CRVO, BRVO, CRAO, Bullous retinal detachment, 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(6). Thus the retina findings may be of help to monitor status of blood pressure control. The condition of the eye reflects the control of the blood sugar levels and in turn the progress of the disease. Blindness due to proliferative retinopathy and maculopathy is five times more common in diabetics with nephropathy. This study shows the ocular status and complications associated with chronic renal failure(7 – 10). Schmechel H et al 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). It is intended to highlight the importance of screening patients for any potential visual threat, so that necessary treatment or advice can be given before they become irreversibly visually impaired.

Glaucoma:

Hypertension and diabetes are common risk factor for glaucoma. Symptoms of blurring or decrease of vision, floaters or flashing lights should alert the physician for ophthalmologist referral. So the present study was done with the aim to evaluate the ocular findings in patients with chronic renal failure (CRF) undergoing haemodialysis (HD).

MATERIAL AND METHODS

This study was conducted in Tertiary care hospital, kadapa, during a period of 12 months. This is a cross sectional, non-interventional, hospital based study. Total 200 patients referred from nephrology ward with chronic renal failure undergoing haemodialysis were examined. There were 80 females and 120 males; aged between 23- 68 years (mean age of 45).

Complete case history of the patient was taken and cases that had undergone following investigations were collected: (1) Hemoglobin, total leukocyte count, differential leukocyte count, erythrocyte sedimentation rate, (2) serum urea, serum creatinine, 24 hour urinary creatinine and urinary volume, (3) serum calcium, (4) serum phosphate, (5) serum electrolytes, (6) USG abdomen, (7) urine routine and microscopic examination and (8) lipid profile.

Criteria For Selection Of Patient:

Patients with chronic renal failure undergoing haemodialysis.

Inclusion Criteria:

Patients referred from nephrology unit with CRF undergoing hemodialysis.

Exclusion criteria: Cases of reversible renal failure.

Each patient was subjected to Visual acuity using Snellen's chart, IOP measurement by Goldman's Applanation tonometer, Anterior segment examination by Slit lamp Biomicroscopy, Posterior segment examination by Direct and Indirect ophthalmoscopy, Fundus Photographs were taken.

RESULTS

Visual acuity was ranging from 6/6 to perception of light in both the eyes. IOP was between 15 – 20 mm Hg in both the eyes. Pterygium was found in 24(24%) patients, pingecula in 8 patients (8%), conjunctival congestion in 12 patients (12%), cataracts in 70 patients (70%). Fundus examination with direct and indirect ophthalmoscopy revealed Hypertensive Retinopathy changes in 96 patients (96%) from stage 1-4 of Keith Wegener's classification. Diabetic retinopathy was found in 66 patients (66%), 40 with NPDR (40%), and PDR in 16 patients (16%), diabetic maculopathy in 10 patients (10%). BRVO in 2 patients(2%) . Glaucomatous optic atrophy was found in 40 patients (40%).

Table:1Best Corrected Visual Acuity In Chronic Renal Failure Patients

WHO Criteria	Visual Acuity	Number	Percentage
Good Vision	6/6	12	12%
	>6/18	62	62%
Impaired Vision	6/24 to 6/60	38	38%
Legally Blind	<6/60	82	82%
	PL ±	6	6%
Total Eyes		200	200

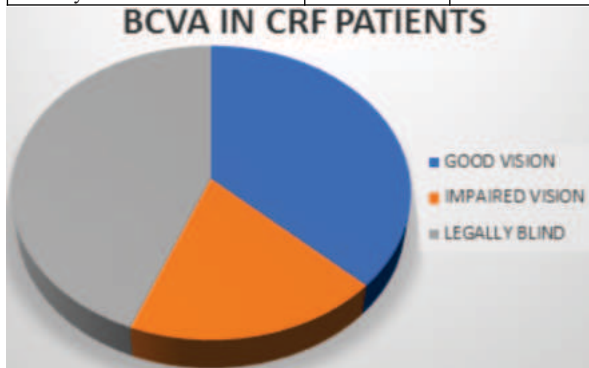


Table :2 Posterior Segment Findings In CRF Patients

Ocular Findings	Number of cases	Percentage
Normal	10	10%
Diabetic retinopathy	66	66%
a)NPDR	40	40%
b)PDR	16	16%
c)Maculopathy	10	10%
HTN retinopathy	96	96%
Glaucomatous optic neuropathy	40	40%
BRVO	2	2%

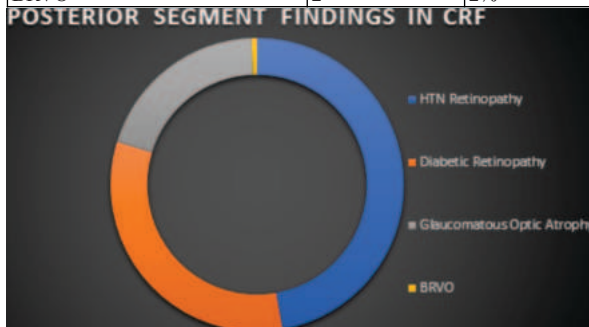


Table :3 Cause Of Visual Impairment In CRF Patients.

Causes of Visual Impairment	Number of Cases	Percentage
Cataract	70	70%
HTN Retinopathy	96	96%
Diabetic Retinopathy	66	66%
PDR	16	16%

Maculopathy	10	10%
Glaucomatous Optic Neuropathy	40	40%
Others	6	6%

DISCUSSION

Conjunctival and corneal calcification which is frequently found in other studies was not found in our study(14).De Marchi S et al studied the IOP changes during hemodialysis(15). Significant IOP changes was not recorded compared to other study. Thirty-seven percent of the total eyes had visual acuity of 6/18 or more. However, visual acuity is not the only indicator of the ocular condition. Advanced DR and HR, may have good central vision until macula is involved. In this study, hypertensive retinopathy accounts for cause of visual loss in the majority, 96 cases (96%). Cataract was the cause for visual impairment in 70 eyes (70%) .

The most important and vision threatening findings were in the posterior segment. Ninety - Six percent of total patients had hypertensive retinopathy. It was more prevalent as the renal disease progressed. The findings correlated well with other studies. Diabetic retinopathy was the cause of visual impairment in 66 cases (66%). In total 66% of diabetic retinopathy, NPDR was seen in 40%, PDR in 16%, maculopathy in 10% of the cases. Glaucomatous optic neuropathy was seen in 40 cases. BRVO was seen in 2 case which was not seen in other studies (10-12).

CONCLUSION

In conclusion, this study shows the importance of detailed ocular examination in patients with CRF. Ocular complications can be detected after detail ocular examinations of patients with CRF. Early detection and treatment prevents morbidity in them . Patients should be made aware of the ocular complication associated with CRF. Appropriate treatment at appropriate time will prevent loss of vision.

REFERENCES

- [1] L Bajracharya, 1 DN Shah, 2 KB Raut3 and S Koirala4 Ocular evaluation in patients with chronic renal failure - a hospital based study, Nepal Med Coll J. 2008;10:209- 214.
- [2] Cohen SL, Gorchein A, Hayward JA et al. Pingueculae an association with renal failure. Queensland Journal Med. 1974;43:281-91.
- [3] Klaassen-Broekema N, van Bijsterveld OP. Red eyes in renal failure. Brit J Ophthalmol. 1992;76:268-71.
- [4] Klaassen-Broekema N, van Bijsterveld OP. The role of serum calcium in the development of the acute red eye in chronic renal failure. Eur J Ophthalmol. 1995;5:7-12.
- [5] Pahor D, Hojs R, Gracner B. Conjunctival and corneal changes in chronic renal failure patients treated with maintenance Hemodialysis. Ophthalmologica. 1995;209: 14-6.
- [6] Dahal P. et al., Ocular findings in the chronic renal failure, Journal of College of Medical Sciences-Nepal, 2014;10:2.
- [7] Huynh SC, Kifley A, Strippoli GF, Mitchell P: Is renal impairment a predictor of the incidence of cataract or cataract surgery? Findings from a population-based study. Ophthalmology. 2005;12:293–300.
- [8] Stibor V, Lachmanova J, Tomasek. Changes in the ocular fundus in patients with chronic kidney failure on regular dialysis therapy. CeskOftalmos. 1989;45:241- 52.
- [9] Evgrafov V Iu, Mamaeva GG, Bishele NA, Liudina LI. Clinical and epidemiological aspects of diabetic retinopathy and its relationship with diabetic nephropathy. VestnOftalmol. 1996;112:40-3.
- [10] Grunwald JE, Alexander J, Maguire M, et al. Prevalence of ocular fundus pathology in patients with chronic kidney disease. Clinical Journal American Society Nephrology. 2010;5:867.
- [11] Schmechel H, Heinrich U. Retinopathy and nephropathy in 772 insulin-treated diabetic patients in relation to the type of diabetes. Diabetes Metabol. 1993;19:138-42
- [12] Leys AM. Eye fundus of the diabetic patient with nephropathy and hypertensive retinopathy. Macroangiopathic complications. Bull SocBelgeOphthalmol. 1995;256:49-59.
- [13] Friberg TR, Eller AW. Serous retinal detachment resembling central serous chorioretinopathy following organ transplantation. Graefes Arch ClinExpOphthalmol. 1990;228:305-9.
- [14] Michaud PA. Corneal and conjunctival deposits in the eyes of patients treated with periodic haemodialysis: Study of 47 patients. KlinMonatsblAugenheilkd. 1978;172:523-6.
- [15] De Marchi S, Cecchin E, Tesio F. Intraocular pressure changes during hemodialysis: prevention of excessive dialytic rise and development of severe metabolic acidosis following acetazolamide therapy.