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Assessment of the Study Ocular Findings in Chronic Kidney Disease Patients Attending A Tertiary Care Hospital

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Abstract
Age, metabolic vascular risk factors including diabetes, hypertension smoking are linked to chronic kidney disease (CKD) and significant eye illnesses such diabetic retinopathy (DR), glaucoma, age-related macular degeneration (ARMD)cataract. After receiving written informed permission, all patients with chronic renal disease who visit the ophthalmology outpatient department (OPD) were included in the research, regardless of their age or gender. Patients who had previously had a kidney transplant as well as those who refused to have a dilated fundus examination were not accepted. 18 months from December 2016 to May 2018 saw the examination of 188 eyes belonging to 104 individuals. According to our research, there was a 65.1% male predominance and a 1.8:1 male to female ratio. The age group of 46-60 years (32.6%) had the highest number of patients seen, with a mean age of 45.23±14.81. The current investigation demonstrated a high correlation between chronic renal disease and ocular manifestations. It is essential that CKD patients have an eye examination in situations where ocular involvement is present since delayed detection of this condition might result in irreparable and permanent sight loss.

INTRODUCTION

In India, the prevalence[1,2] of 17.2% is known. The process is gradual and irreversible[3], eventually leading to end-stage renal failure. Due to the fact that it is much more prevalent than is officially documented[4], renal failure is often not discovered or diagnosed until the illness is well advanced.

Ocular co-morbidities[5,6,7] may result from diabetes, uraemia, anaemia, hypotension, haemodialysis side effects, or from other factors that contribute to chronic renal failure. Reduced vision may be attributed to several conditions such as focal retinal vein obstruction, ischemic optic neuropathy, hypertensive or diabetic retinopathymore. When retinalopathy is at its most curable stage, it often presents with no symptoms, nevertheless, if it is not diagnosed in a timely manner, the patient's risk of vision loss increases significantly. The disease process's metabolic regulation is revealed by the state of the eyes.

There exists a significant association between kidney and eye problems because the kidney and retina grow at the same time during the embryonic stage, which is around the fourth or sixth week of pregnancy[8]. Age, metabolic vascular risk factors including diabetes, hypertension smoking are linked to chronic kidney disease (CKD) and significant eye illnesses such diabetic retinopathy (DR), glaucoma, age-related macular degeneration (ARMD)cataract. Numerous studies confirm the tight connection between renal and ocular disorders. Patients with CKD are more likely to develop ARMD, DR, glaucoma cataracts. Ocular symptoms, such as retinal micro vascular alterations, may also predict the onset of CKD. Additionally, CKD may present as developmental abnormalities of oculorenal syndromes in the eyes[9]. This article has covered common risk factors for kidney and eye disorders as well as the ocular symptoms of numerous renal pathologies and their pathogenic processes.

MATERIALS AND METHODS

The Institutional Ethical Committee granted approval. 104 was the estimated sample size (n) based on known prevalence rates. After receiving written informed permission, all patients with chronic renal disease who visit the ophthalmology outpatient department (OPD) were included in the research, regardless of their age or gender. Patients who had previously had a kidney transplant as well as those who refused to have a dilated fundus examination were not accepted. Snellen charts for farsightedness and Jaeger's charts for nearsightedness were used to examine the eyes. Schirmer's test was used to evaluate dry eyesan applanation tonometer was used to measure intra ocular pressure. Both pupils were dilated with a 1% tropic amide eye solution. Slit lamp examination of the anterior segment, dilated fundus examination using direct and indirect ophthalmoscopy90D slit lamp biomicroscopy.

If systemic investigations had previously been carried out, they were reported, including complete blood counts, serum urea, serum creatinine, serum calcium, serum phosphate, serum electrolytes, urine routines and microscopy, fasting and postprandial blood sugar levels abdominal ultrasounds.

Inclusion Criteria:

- Chronic renal disease in all its phases
- People who have had renal transplants
- Renal illness that lasts longer than three months
- Age range of 20-70 years old

Exclusion Criteria:

- Individuals whose cause of renal illness is uncertain.
- Acute fulminant illness cases
- Instances when an eye illness was known to preexist

RESULTS AND DISCUSSIONS

A total of 188 eyes of 104 patients were examined over a period of 18 months from December 2016-May 2018. Our study showed a male preponderance (65.1%) with a male to female ration of 1.8:1. Maximum patients were seen in the age group of 46-60 years (32.6%) with mean age of 45.23±14.81. (Table 1)

All the 104 patients had normal intra-ocular pressure. Dry eye evaluation done by Schirmer type 1 test was divided into normal, mild, moderate and severe category. Maximum number of the eyes fell in the normal category (Table2).

Similar findings were reported in the research An eye on chronic kidney disease by Navdeep Gupta[10] which comprised 106 patients in total, of whom 37 were female and 69 were male (M: F = 1.9:1).

We found that older age groups had a greater frequency of CKD. The average age of the 9644 participants in Gao[5] research, Ocular fundus pathology and chronic kidney disease in a Chinese population, was 52.8 16.0 years, which was comparable to our findings.

Among the 84 patients with CKD in our study, only 17 patients (20.23%) needed dialysis. Of these, 13 patients (76.5%) had ocular involvement, including lid edoema and pterygium, 6 patients (46.15%) had hypertensive retinopathy, 3 patients (17.64%) had

Table 1: Distribution of CKD patients according to their age

Age (In years)	No. of Patients	Percentage (%)
1-18	0	0%
19-30	22	21.1%
31-45	31	29.8%
46-60	34	32.6%
>60	17	16.3%
Total	104	100%

Table 2: Distribution of posterior segment findings according to stage of CKD

S. No.	Stage of CKD Posterior segment	Mild (21 cases)	Moderate (25 cases)	Severe (19 cases)	ESRD (20 cases)	Total 104	p-value
1)	finding Diabetic retinopathy	4(19.0%)	5(20%)	9(47.3%)	11(55%)	29(27.8%)	0.014*
2)	HTN retinopathy	16(76.1%)	19(76%)	13(68.4%)	16(80%)	64(61.5%)	0.864
3)	Vitreous haemorrhage	0	0	0	2(10%)	2(1.9%)	0.342
4)	Retinal detachment	0	0	0	2(10%)	2(1.9%)	0.343
5)	Disc oedema	0	2(8%)	0	0	2(1.9%)	0.506
6)	BRVO(IT)	0	0	0	1(5%)	2(1.9%)	0.343
7)	CSME	0	0	0	1(5%)	2(1.9%)	0.343
8)	Macular edema	0	1(4%)	0	0	2(1.9%)	0.508

diabetic retinopathy, 1 patient (0.5%) had retinal detachment and 1 patient (0.5%) had branch retinal vein occlusion (BRVO). This may be the case since dialysis often necessitates severe CKD and ESRD dialysis itself significantly alters metabolism. Comparable outcomes were found by B. Malleswari[11] in their research, Eye Findings in Chronic Renal Failure Patients Undergoing Haemodialysis, which had 64 patients in total. Nine patients (14%) had pterygium, two patients (3%), four patients (6%) had conjunctival congestion twenty-four patients (38%) had cataracts. Additionally, one patient (2%), had BRVO. Twenty patients (31%), thirteen with NPDR (20%), four with PDR (6%), three with diabetic maculopathy (5%) and two with glaucomatous optic atrophy (3%), were confirmed to have diabetic retinopathy. In 28 individuals (44%), hypertensive retinopathy was discovered. This result was comparable to the 46.15% of patients in our research who had hypertensive retinopathy.

Compared to diabetes (10.71%), we discovered a stronger relationship between HTN (54.76%). In their research, Navdeep Gupta *et al*. also observed that, among 51 patients (48.12%), hypertension was the most frequent systemic relationship with chronic kidney disease (CKD), followed by diabetes in 26 individuals (24.53%). Studies by Dahal P *et al* and Ahmed E. Khatatbeh[12] produced findings that were comparable. Thirteen

Our analysis revealed that the greatest proportion of patients, or 29.76%, had intermediate stage CKD, followed by mild disease in 21 patients (25%) and end stage renal disease in 20 patients (23.8%)severe disease in 19 patients (22.61%). 80 instances of mild stage CKD (26.67%), 84 cases of moderate stage CKD (28%), 75 cases of severe stage CKD (25%) and 61 cases (20.33%) of end stage renal disease were reported in the research by Dahal[13] Additionally, 25 patients (29.76%) in our research had moderately advanced CKD. Similar findings were also found in studies by Navdeep Gupta *et al*. (9 and L Bajracharya[14]

We found that the posterior region yields more information than the anterior segment. In contrast, 72% of patients had anterior segment findings, according to a study by B. Malleshwari[11] whereas posterior segment abnormalities were present.

CONCLUSION

An irreversible multi system condition that affects several systems, including the eye, is chronic renal disease. Two major conditions linked to chronic kidney disease, which also impairs eyesight, are diabetes mellitus and hypertension. When CKD patients have ocular symptoms, the majority of them are referred to an ophthalmologist. If ocular involvement in CKD patients is not identified in a timely manner, it may result in irreparable and permanent sight loss. In order to guarantee prompt action, avoid vision loss prevent ocular morbidities, it is imperative that all patients with chronic kidney disease get an eye examination as soon as possible.

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