

Ocular complications in live-related renal transplant recipients: A single-centre study

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Abstract

Renal transplantation is considered to be the treatment of choice for patients with end-stage kidney failure. While transplantation has a high success rate, there are a number of associated challenges which include those related to the primary disease, transplant procedure as well as medications that are necessary to take after transplantation. Steroids, for instance, have been reported to lead to ocular complications in patients who have undergone renal transplantation in other parts of the world. This retrospective case series reports the pattern of ocular complications among patients who underwent renal transplant since the inception of ophthalmology clinic at a dialysis and transplant centre in Karachi, Pakistan.

The case series corroborates the findings of other similar studies from around the world, with cataract being the most common occurrence in this cohort. A unique finding in Pakistani setup includes the high prevalence of night blindness, which requires investigation in a larger cohort prospectively.

Keywords: Ocular complications, Night blindness, Renal transplant.

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Introduction

Renal transplantation is considered the treatment of choice for patients with end-stage renal disease.¹ Solid organ transplantation that started as an experimental procedure in the early twentieth century has now evolved into the definitive treatment option for patients suffering from end stage organ failure.² Despite its popularity and high success rate, organ transplantation comes with many challenges, including management of complications caused by the disease, transplant procedure, and post-transplant medications.³

Ophthalmic complications in renal transplant recipients (RTRs) have been studied and reported world-wide.⁴⁻⁸

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Common problems reported in one study include cataract, glaucoma, and herpetic keratitis,⁹ while another study reported additional issues like hypertensive retinopathy, conjunctival deposits, and drug-induced retinitis.⁴ Sight-threatening complications, including central serous chorioretinopathy, endogenous endophthalmitis, and viral retinitis, have also been reported.⁶ The majority of these complications are attributed to steroids and immunosuppressive therapy; however, many are caused by the systemic disease responsible for renal failure or acquired as a consequence of the procedure, including cardiovascular disease, hypertension, hyperlipidaemia, thromboembolism, and hyperparathyroidism.¹⁰

The current retrospective study that reviewed data from Sindh Institute of Urology and Transplantation, the first transplant centre in the country, is novel in terms of its contribution to the Pakistani literature since it provides an overview of the pattern of ocular diseases among transplant patients, an area that has not been assessed before, to the best of the authors' knowledge.

Case Series

Case files of 100 patients were studied who visited the eye referral clinic for the first time at the transplant centre between November 2013 and December 2014. The Department of Ophthalmology was established at the institute in November 2013. The data was analysed in November 2021. This study was approved by the scientific review committee at the institute. Ethical approval was not sought since this was a retrospective descriptive case series with no risk of patients being identified and, therefore, was considered a no-risk study.

Presenting complaints and associated findings were noted along with clinical examination including visual acuity assessment using Snellen chart and intraocular pressure measurement with computerised tonometer. Anterior and posterior segments of the globe were examined using slit lamp bio-microscope. Orbit and adnexa were also assessed. All relevant findings were noted and the patients were treated accordingly. Data from patients' files was recorded on a predesigned data collection instrument.

Statistical Analysis: Data was entered and analysed using SPSS version 20. Descriptive statistics were used.

Mean±standard deviation (SD) were used in continuous variables, and frequency (percentages) for categorical variables.

Results

A total of 100 RTRs with ocular problems were studied. Out of these, 70 (70%) were males and the remaining 30 (30%) were females.

Fifty (50%) subjects were between the ages of 21 and 40, with a mean age of 34.29±11.73 years (Table 1).

Cataract was the most common ocular problem seen in transplant recipients, at the high number of 36 (36%). This was followed by night blindness in 15 (15%) patients, infections in 14 (14%), refractive error in 9 (9%), hypertensive retinopathy in 3 (3%), allergic conjunctivitis in 2 (2%), dry eyes in 2 (2%), and others in 19 (19%), as shown in Figure 1.

The period of renal transplantation is displayed in Table 2. Detailed description of the different types and subtypes of problems involving the eye are elaborated in Table 3.

Table-1: Distribution of age (n=100).

Age groups (years)	n (%)
9 – 20	14 (14.0)
21 - 40	50 (50.0)
>40	36 (36.0)

Table-2: Duration since renal transplant (n=100).

Duration (years)	n (%)
< 1	30 (30)
1-5	39 (39)
6-10	23 (23)
11-15	2 (2)
> 15	6 (6)

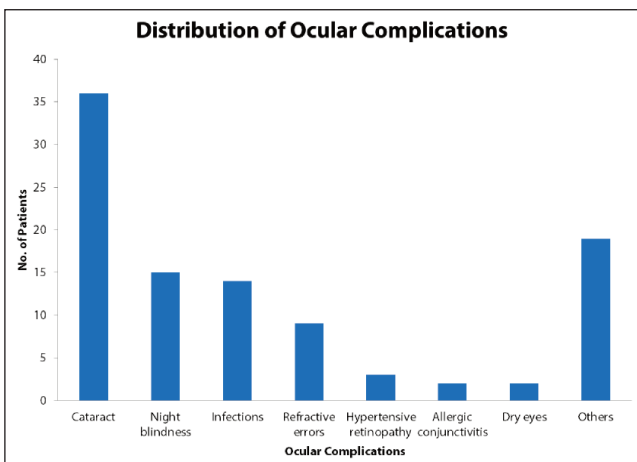


Figure: Distribution of ocular complications.

Table-3: Distribution of spectrum of ocular complications (n=100).

Ocular complication	n (%)
Cataract	
Posterior Sub-Capsular Cataract	21 (21)
Nuclear Sclerosis + Posterior Sub-Capsular Cataract	10 (10)
Nuclear Sclerosis	3 (3)
Early lenticular changes	3 (3)
Mature cataract	1 (1)
Cortical Cataract + Posterior Sub-Capsular Cataract	1 (1)
Infections	
Bacterial conjunctivitis	5 (5)
Viral conjunctivitis	4 (4)
Blepharitis	3 (3)
Intermediate uveitis	1 (1)
Central corneal abscess	1 (1)
Stye	1 (1)
Miscellaneous	
Refractive error	9 (9)
Hypertensive retinopathy	3 (3)
Night blindness	15 (15)
Pseudophakia + Posterior Capsular Opacification	2 (2)
Allergic conjunctivitis	2 (2)
Dry eyes	2 (2)
Papilloedema	1 (1)
Central serous chorioretinopathy	1 (1)
Hyperaemia with dilated conjunctival vessels	1 (1)
Traumatic lid laceration	1 (1)
Corneal Foreign body	1 (1)
Subconjunctival haemorrhage	1 (1)
Anterior lenticonus	1 (1)
Conjunctival growth	1 (1)
Anisometropic amblyopia	1 (1)
Macular scar	1 (1)
Convergence insufficiency	1 (1)
Viral keratoconjunctivitis	1 (1)
Fuch's endothelial dystrophy	1 (1)
Total	100 (100)

Discussion

This study, set in Pakistan, makes a novel contribution in terms of providing an overview of the pattern of ocular diseases among renal transplant patients, from within the local context. The chart review confirmed known facts but also reported new findings regarding ocular involvement in renal transplant recipients.

The first one hundred patients who visited our clinic since its commencement were selected for the study. All renal transplant recipients at the institute are followed-up for life. These patients are still being observed and any complications, they present with, are dealt with accordingly. These findings will be published in another article.

Ocular problems are widespread among renal transplant patients, as the current study demonstrates. Steroids are still commonly used in post-transplant medical treatment

despite recent advances in immunosuppression. Their potential adverse effects on the eye have been numerous, and devastating. These include cataract, glaucoma, and opportunistic infections to name a few.^{10,11} Loss of vision may be prevented, and quality of life may be improved by regular follow-ups by an ophthalmologist and timely intervention as needed.¹²

The demographics of the patient population can be explained by the trends of transplantation itself. Majority of renal transplantation at the institute is performed on young and middle-aged adults. Moreover, mostly males receive transplant due to sociocultural norms, though biological factors are also a contributor.¹³ Therefore, the high number of males in our sample is explained by both these factors.

The findings of this study, mainly posterior subcapsular cataract, infectious conjunctivitis, and central serous chorioretinopathy corroborates those from international literature.⁴⁻⁹ However, night blindness appears to be predominant in Pakistani renal transplant patients, which is something that is not reported widely in literature. This may be due to vitamin A deficiency, as supported by the presence of conjunctival Bitot's spots in a few patients. This hypothesis is further supported by symptomatic treatment of oral Vitamin A capsules and dietary Vitamin A supplements of these patients resulting in improved outcomes within three months.

Although no evidence exists to prove that renal transplantation or the treatment needed for graft survival causes the deficiency of this essential vitamin, experience from the centre leads to the conclusion that patients with renal transplants may develop Vitamin A deficiency, the cause of which may be malnutrition, the disease burden itself, or the adverse effects of post-transplant medications. This symptomatic finding needs further prospective studies with serum vitamin A levels and toxicity of specific medications to establish the relationship between night blindness and renal transplant. This could not be performed in our setting due to resource constraints but other well-equipped centres may find these finding useful for future research prospects.

Of the patients with cataract, a majority of them [31 (31%)] had steroid-induced posterior subcapsular cataract, while only 6 (6%) had cataract that was not related to steroids. This finding is strongly supported by international literature.¹⁴⁻¹⁷ Studies have provided substantial work to understand the relationship between systemic corticosteroid intake, patient's susceptibility to steroid, and its effect on the occurrence and severity of posterior subcapsular cataract.¹⁸⁻²¹ The average age of developing

cataract in this cohort is much lower than the average Pakistani population.²²

Systemic infections including bacterial, viral, and fungal, are considered to be a common cause of morbidity and mortality after transplantation.²³ In our extensive literature search, it was noted that herpes simplex virus, cytomegalovirus, and other opportunistic infections were the main ocular infections.^{24,25} It is believed that the immunocompromised state of transplant patients makes them susceptible to other ocular infections, including bacterial and viral conjunctivitis (9%), blepharitis (3%), corneal abscess and stye (2%). Keratoconjunctivitis sicca (dry eyes), hypertensive retinopathy, subconjunctival haemorrhage, papilloedema, and uveitis have been discussed at different times in literature emphasising the importance of ophthalmic evaluation and timely management in order to save the sight and improve the quality of life of patients who have had a kidney transplanted.²⁶⁻²⁸

This study proves the extensive involvement of eye and adnexa in renal transplant recipients. It also indicates that ocular examination and treatment may be needed very early after transplantation, and is not proportional to the duration of surgery (majority 69[69%] of our patients presented within the first 5 years). Regular ophthalmic examination is, therefore, recommended and should be an integral part of these patients' post-transplant follow-ups. This has lessons for other tertiary care facilities offering transplant services within the country.

Moreover, further work has to be done to establish the cause of night blindness and keratoconjunctivitis sicca, which occurs possibly due to vitamin A deficiency as suggested by the symptomatic improvement after oral replacement.

Conclusion

This study is helpful in terms of its contribution to the local literature. It stresses on the importance of regular follow-up in eye clinic after transplantation, and emphasises on cataract development and the need for its detection in order to provide a good quality of vision and life post-transplant. While it confirms findings from other similar studies conducted internationally, a unique finding from this setup is the high prevalence of night blindness in renal transplant patients. More prospective studies are required within this area to establish a causal relationship between renal transplant and night blindness, a limitation of the current study.

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