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SURVIVAL ANALYSIS AND VISUAL OUTCOME OF CORNEAL TRANSPLANT IN NORTH EAST INDIA

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ABSTRACT The public health significance of corneal transplantation in dealing with corneal blindness in the developing world would depend upon the survival rate of transplant. This study was done to analyze the survival rate of corneal transplant in North East India and to evaluate the influence of various risk factors on transplant survival.

The records of a series of 65 cases of corneal transplants carried out during 2018-19. The Kaplan-Meier method was used to determine one year survival rate of corneal transplant performed for the various categories of postoperative cases. Cox proportional hazard regression was used to assess how different categories of surgeries, socioeconomic status, age, sex, quality of donor cornea influenced transplant survival. The effect of these variables on visual outcome was assessed using multiple logistic regression.

The survival rate was highest if the corneal transplant done by Descemet Stripping Endothelial Keratoplasty and lowest for Patch Graft surgery. There is a decrease in hazard ratio by 73% for Descemet Stripping Endothelial Keratoplasty surgery. Patients with lower socioeconomic status had higher relative risk of transplant failure. Patients less than 30 years of age had relatively higher risk of transplant failure. Female patients had relatively higher risk of transplant failure as compared to male patients. Higher relative risk of transplant failure was associated with the use of fair quality donor cornea for transplantation compared with excellent and good quality donor cornea.

Reasonable success with corneal transplantation is possible in the developing countries if data from this part of world regarding different survival rate for the various categories of surgeries and the influence of risk factors on transplant survival and visual outcome are taken into account while determining priority for transplant cases in the present situation of limited availability of donor cornea.

KEYWORDS : Kaplan-Meier method, Cox proportional hazard model, Descemet stripping endothelial keratoplasty, Patch graft

INTRODUCTION:

Blindness and visual impairment due to corneal disease is a significant public health problem in the developing world. Visual rehabilitation with corneal transplantation may be a possibility in many of these cases. In order to assess the role of corneal transplantation could play in visual rehabilitation of the corneal blindness in the developing world, data on the survival rate of corneal transplants in the developing world are required.

We analyze the survival of corneal transplant in a series of 65 cases done during 2018-19. The influence of potential risk factors on transplant failure and visual outcome was also analyzed. These data were expected to provide some basis for assessing the potential public health significance of corneal blindness in the developing world.

Data were obtained by reviewing the patient records of a series of 65 corneal transplants. Out of 65 cases, 24 cases were done by Optical Keratoplasty, 32 cases were done by Therapeutic Keratoplasty, 1 case was done by Deep Anterior Lamellar Keratoplasty, 5 cases were done by Patch Graft, 3 cases were done by Descemet Stripping Endothelial Keratoplasty. The survival rate of corneal transplant performed for the various surgery were determined by Kaplan-Meier method. The effect on transplant survival of various surgery, socioeconomic status, age, sex, quality of donor cornea was studied using Cox Proportional Hazard model.

Methodology:

For the present report, the patients who could not pay for the services were considered to have lower socioeconomic status and those who could pay were considered to have higher socioeconomic status.

Quality of donor cornea used for transplant was graded as excellent, good and fair based on standardized Slit-lamp evaluation of all layers of cornea before the surgery.

The corneal transplant was considered to have failed if it did not retain optical clarity for any reason.

Blindness in an eye was defined using visual acuity criterion of < 3/60 recommended by WHO.

To determine statistical significance, 95% confidence interval were calculated for the estimates.

Cox proportional hazard model:

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
surgery			1.764	4	.779			
surgery(1)	7.662	88.081	.008	1	.931	2126.153	.000	2.005E+078
surgery(2)	-1.307	1.352	.934	1	.334	.271	.019	3.834
surgery(3)	8.245	88.084	.009	1	.925	3808.041	.000	3.610E+078
surgery(4)	-.671	1.226	.300	1	.584	.511	.046	5.651
status	-1.213	.864	1.971	1	.160	.297	.055	1.617
quality			.011	1a	.917			
quality(1)	9.128	88.071	.011	1	.917	9210.937	.000	8.525E+078
age	.401	.740	.294	1	.588	1.493	.350	6.368
gender	.261	.515	.257	1	.612	1.298	.473	3.563

The negative value of B indicate decrease in hazard ratio.

0, 1, 2, 3, 4 indicate optical keratoplasty, therapeutic keratoplasty, descemet stripping endothelial keratoplasty, patch graft, deep anterior lamellar keratoplasty respectively.

For Surgery(4) means for Deep Anterior Lamellar Keratoplasty, Exp(B) is .511, we calculate (.511x100-100) = -48.9. There is a decrease in hazard ratio by 49%.

For Age, Exp(B) is 1.493. We calculate (1.493x100-100)=49.3, increase in age by 1 year hazard ratio increase by 49.3%.

For Gender, Exp(B) is 1.298. There is increase in hazard ratio by 30% for females as compared to males.

Since p values are greater than 0.05, we may conclude that there is a no significant effect of different types of surgeries on corneal transplantation.

This study documents, the survival rates in a large series of corneal transplant and the influence of risk factors on transplant survival in the North East India. Blindness due to corneal diseases is a significant public health problem. Corneal transplant is the only option for visual rehabilitation of those currently blind from corneal diseases.

Descemet Stripping Endothelial Keratoplasty and Deep Anterior Lamellar Keratoplasty, the risk of transplant failure is lower than other type of surgeries.

Patients belonging to lower socioeconomic status had a significantly higher risk of transplant failure. This may be related to poorer compliance with postoperative care.

Age less than 30 years at the time of transplant increased the risk of transplant failure as compared to age group greater than 30 years.

Caution may be exercised in attempting transplantation especially because of scarcity of donor cornea. This raises the need for quality eye banking for procuring, handling, storing donor corneas. The finding in the present study says that the use of fair quality donor cornea resulted significantly higher relative risk of transplant failure than for excellent and good quality donor cornea.

REFERENCES :

1. Lalit Dandona, Thomas J. Naduvilath, M. Janarthanan, Krishnan Ragu, Gullapalli N Rao. British Journal of Ophthalmology 1997; 81:726-731.
2. Thylefors B, Negrel AD, Pararajasegaram R, Dadzie KY. Global data on blindness. WHO 1995; 73:115-121.
3. Kaplan EL, Meier P. Nonparametric estimation from incomplete observation. Journal of American Statistical Association. 1958; 53: 457-81. .Goodman I.A., Kruskal WH.
4. Measurement of association for cross classification. Journal of American Statistical Association 1954; 49: 732-64.
5. Goodman I.A. Kruskal Measurement of association for cross classification. Journal of American Statistical Association. 1954