Original Article

Nursing contribution to reduce potential rejection of corneal transplants*

Contribuição do enfermeiro para possível redução de rejeição ao Transplante de Córnea

Contribución del enfermero para posible reducción del rechazo al Transplante de Córnea

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ABSTRACT

Objective: To assess the nursing contributions that reduce rejection rates of corneal transplants in Sergipe. **Methods:** A retrospective, exploratory study was conducted of quantitative corneal donor and recipient records, between the years of 2003 – 2008, at the Notification Center, Organ Procurement and Distribution of Sergipe (CNCDO-SE). **Results:** We analyzed 350 harvested organs, 309 transplants, 185 donors and 39 rejections. Of the corneas harvested by nurses, 83.73% were usable, 15.44% were discarded, and 6.50% were rejected. A review of corneal harvests by other professionals found 72.72% were usable, 27.27% were discarded and 13.65% were rejected. **Conclusion:** The cornea harvested by nurses had fewer rejections and increased chance of positive outcomes. Recipient and donor variables were not found to influence the rejection.

Keywords: Eye banks; Corneal transplantation; Graft rejection

RESUMO

Objetivo: Verificar as contribuições do Enfermeiro para a possível redução dos índices de rejeição ao transplante de córnea em Sergipe. **Métodos:** Estudo exploratório, retrospectivo e quantitativo em prontuários de doadores e receptores de córnea de 2003 a 2008 da Central de Notificação, Captação e Distribuição de Órgãos de Sergipe (CNCDO-SE). **Resultados:** Foram analisados 350 captações, 309 transplantes, 185 doadores e 39 rejeições. Das córneas captadas pelo enfermeiro, 83,73% foram aproveitadas, 15,44% foram descartadas e 6,50% apresentaram rejeição. Das córneas captadas por outro profissional, 72,72% foram aproveitadas, 27,27% foram descartadas e 13,65% apresentaram rejeição. **Conclusão:** As córneas captadas pelo enfermeiro apresentaram menor índice de rejeição e maior aproveitamento. As variáveis ligadas ao receptor e ao doador não influenciaram nas rejeições.

Descritores: Bancos de olhos; Transplante de córnea; Rejeição de enxerto

RESUMEN

Objetivo: Verificar las contribuciones del Enfermero para la posible reducción de los índices de rechazo al transplante de córnea en Sergipe. **Métodos:** Se trata de un estudio exploratorio, retrospectivo y cuantitativo con historias clínicas de donadores y receptores de córnea de 2003 a 2008 de la Central de Notificación, Captación y Distribución de Órganos de Sergipe (CNCDO-SE). **Resultados:** Fueron analizadas 350 captaciones, 309 transplantes, 185 donadores y 39 rechazos. De las córneas captadas por el enfermero, 83,73% fueron aprovechadas, 15,44% fueron descartadas y 6,50% presentaron rechazo. De las córneas captadas por otro profesional, 72,72% fueron aprovechadas, 27,27% fueron descartadas y 13,65% presentaron rechazo. **Conclusión:** Las córneas captadas por el enfermero presentaron menor índice de rechazo y mayor aprovechamiento. Las variables ligadas al receptor y al donador no influenciaron en los rechazos.

Descriptores: Bancos de ojos; Trasplante de córnea; Rechazo del injerto

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INTRODUCTION

The cornea is a transparent membrane that, together with the lens, focuses the objects. When this membrane becomes opaque, it is necessary to replace it for a transparent one. This is called cornea transplantation or keratoplasty[1].

Although corneal transplantation is the most successful procedure among tissue transplants in human beings, and the one that is most commonly performed currently, in some cases patients may evolve to corneal graft rejection. Rejection processes can be epithelial, stroma or endothelial separately, or they can occur in the three areas together[2].

Corneal graft rejection is an immunological process of cellular reaction that occurs in the post operative period, and it is the main cause for keratoplasty failure[3]. It is possible to assess the presence of graft rejection two weeks after surgery, because this is the necessary time for antigen recognition and triggering of the rejection process[2].

According to the studies carried out, some factors predispose rejection in corneal transplantation procured by eye bank, the following are among them: donor's age, time between death and enucleation, and time of preservation and transplant[4].

Some theories connect the cause of donor's death as the most important factor for the quality of cornea since, theoretically, the corneas donated by victims of multiple trauma can present decrease in endothelial cells, making them poor quality. But, the assessment made in an Eye Bank connected with a school-hospital where they assessed if the cause of death, time of conservation and age of the donor had influenced in the best quality of corneas, concluded that: "the factor donors' age was more important than the cause of death and time cornea had been preserved after death for the amount of endothelial cells". However, the same authors considered that the factor age should not be the only item to be considered in corneal assessment due to the importance of the other factors involved[5].

Considering that nursing assistance to the donor has the purpose of making all the process to procure/donate the organ feasible, nurses have to perform the enucleation of the eyeball, as long as they are technically qualified by the Pan-American Association of Eye Banks(APABO), and this role is not only of the ophthalmologist[6].

According to the Resolution # 292/2004 of the Federal Nursing Council that regulates the work of nurses in the procurement and in the transplant of organs and tissues, they should: plan, run, coordinate, supervise and assess nursing procedures provided to donors, notify the Central Offices for Notification, Capture and Distribution of organs (CNCDO) the existence of a potential donor, request the written authorization of a patient legal guardian through the Statement of Consent, ensuring the right to discuss about donation with the family, and ensuring that all donation process can be stopped at any time. Care should also be provided to cornea recipients, applying the Nursing Care Systematization (SAE) in the pre and post transplant periods. Therefore, the role of nurses within these institutions is essential since they take part in the whole process to donate corneas, from the family interview to the conservation of procured tissue[6].

In a study carried out at Hospital de Clínicas in Porto Alegre, to make the participation of nurses in the process to procure corneas visible to the academic communities and professionals, it was seen that they had been responsible for 75% of the total number of donations[1].

With the technological advances that occurred in the last decades, the Eye Banks supplied a better quality of life to people that were in the waiting list for corneal graft. This improvement in the quality of life occurred because of a careful assessment of eye procurement, which is an essential factor for the success of keratoplasty[5].

The Eye Bank or Eye Tissue Bank (BTOC) is the service that has physical, material and human resources, and that is technically appropriate for donor search, family interview, donation TCLE obtaining, donor clinical and laboratory screening, removal, identification, transport to the BTOC, assessment, preservation, storage and make human eye tissues available for therapy, research, teaching or training purposes; these activities are exclusive to the BTOC[7].

Currently in Sergipe, there are 338 people waiting for corneal transplantation. The mean time these people will wait for transplantation is 3 years[8].

As far as we could see, there are few studies being carried out in Brazil about rejection of corneas procured by the Eye Bank[2,4,9-10].

Because it is relatively a new area to nurses, we attempted to check the contribution of these professionals in the process of eye procurement. Due to the lack of scientific studies that prove the importance of Nurses in the reduction of graft rejection, we have compared the indexes and investigated variables that may have favored this process.

METHODS

Exploratory and retrospective study with a quantitative approach, assessing charts of cornea donors and recipients in the years from 2003 to 2008. Data collection was carried out in the Central Offices for Notification, Capture and Distribution of organs of Sergipe (CNCDO-SE), after the project was approved

by the Research Ethics Committee at Universidade Tiradentes, under number 230909R. A Roadmap for Data Capture (RCD) was used as collection instrument, designed by the researchers, based on the publications from CNCDO-SE.

The variables of the present study were the indexes of use, discharge, and rejection of corneas harvested by nurses or other professionals. Regarding the donor, variables such as age, gender, death cause, death diagnosis (brain death or irreversible cardiac arrest); and regarding the recipient, variables such as age, gender, pre-operative diagnosis and classification of the surgeries (emergency or elective), were assessed to check for possible correlation with the observed rejection indexes.

Seropositive donors, those with both corneas discarded due to morphological changes, as well as charts whose corneas had been received or donated by other State or country, have been excluded, together with those we couldn't find during collection.

Data have been assessed with the help of the program Excel 2007.

RESULTS

We have assessed 350 procurements, 309 transplants, 185 donors, and 39 recipients that presented transplant rejection.

As for the profile of the cornea donor (Table 1), it was seen that 69.72% of the corneas donated were from male donors, the age group with the highest percentage of donation was from 46 to 55 years (24.32%) followed by 16 to 25 years old (20%). As for cause of death, 51.35% died from natural causes (stroke, cancer, heart diseases and other diseases) and 48.35% from external causes (traumas and exogenous intoxication). It was also seen that most (82.16%) became donors after irreversible cardiac arrest (CA) and only 15.67% donated after brain death (BD); there was one donor alive.

Of the 309 transplanted patients in the researched period, 39 (12.62%) presented transplant rejection.

When the profile of the recipient that presented rejection to cornea transplant was assessed (Table 2), we have observed that 53.85% were males; 48.7% were in the age group above 59 years old, that is, elderly people; 25.6% were adults, 18% were young, and 7.7% were children. Regarding the preoperative diagnosis, Bullous Keratopathy was the most commonly found (30.8%), followed by Leukoma (15.4%) and Keratoconus (10.2%). As for the classification of surgery, 70.96% of the recipients that presented rejection had their first transplant classified as elective and 29.04% as emergency.

When the rejection percentages were related per professional, it was seen that 6.5% of the recipients transplanted with cornea harvested by nurses presented rejection and that those harvested by other professionals presented a 13.65% index (Picture 1).

Table 1 – Cornea donors profile. Sergipe - PI, 2003/2008

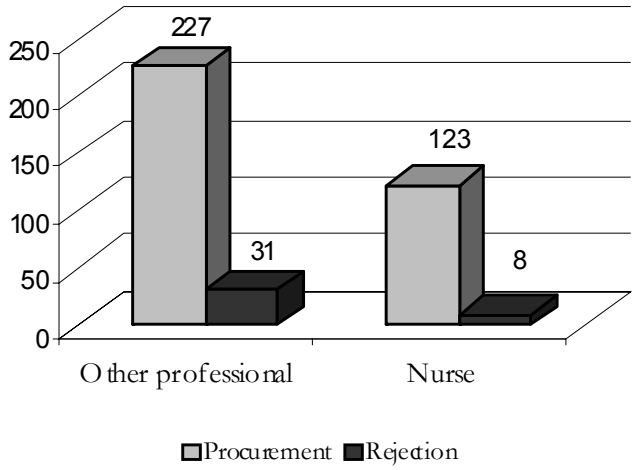
	n (185)	%
Gender		
Male	129	69.72
Female	56	30.28
Age		
0 to 15 years	9	4.86
16 to 25 years	37	20.00
26 to 35 years	30	16.21
36 to 45 years	36	19.45
46 to 55 years	45	24.32
56 to 65 years	27	14.59
Over 65 years	1	0.57
Cause of death		
Natural Causes	95	51.35
External Causes	90	48.65
Diagnosis		
Cardiac Arrest	152	82.16
Brain Death	29	15.67
Not registered	3	1.62
Living donor	1	0.55

Table 2 – Profile of the recipient that presented rejection to corneal transplantation. Sergipe - PI, 2003/2008

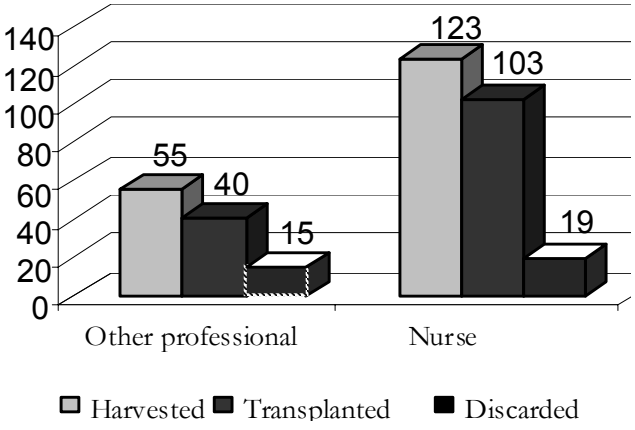
	n (39)	%
Gender		
Male	21	53.85
Female	18	46.15
Age		
0 to 7 years	3	7.7
8 to 25 years	7	18.0
26 to 59 years	10	25.6
Over 59 years	19	48.7
Preoperative diagnosis		
Bullous Keratopathy	12	30.8
Rejection to the 1st transplant	8	20.5
Leukoma	6	15.4
Keratoconus	4	10.2
Corneal ulcers	3	7.7
Fuchs dystrophy	3	7.7
Traumatic perforation	3	7.7
Surgery classification		
Elective	28	70.96
Emergency	11	29.04

Among the corneas that were assessed by a BTOC, 83.73% of those harvested by nurses were used for transplant and 15.44% were discarded by the Bank because they were not feasible for transplantation. Among those harvested by other professionals, 72.72% were used and 27.27% were discarded after assessment

by the Bank (Picture 2).



Picture 1 - Procurement and rejection by professional. Sergipe - PI, 2003/2008



Picture 2 - Use of corneas, after assessment of the Eye Bank, Sergipe - PI, 2003/2008

DISCUSSION

When the donor profile is assessed, the results found are similar to previous studies[4,9-11].

Authors mention that the greater prevalence of male cornea donors can be explained by the greater occurrence of death in this population[9].

A survey carried out in the Eye Bank from Hospital São Paulo demonstrated that the prevalent age group was between 56 and 58 years old[9]. In the study of Adán et al., most donors were over 60[10]. Researchers say that corneas of older donors are perfectly acceptable for transplant[4]. It is important to highlight that, during the time of the study (2003 to 2008), the limit age for cornea donors in Sergipe was up to 65 years old, which is different from other studies, where there is no age limit for cornea procurement.

When donors' causes of death were studied, there were no significant differences. A study carried out in São Paulo, from 1996 to 2005, demonstrated that in the first 5 years, the external causes corresponded to 5.8% of donors' death, increasing to 16.3% in the second stage of the study[10]. This may be related to the way of life of people, and the increase in violence, which can lead to a number of progressive losses of lives.

A study carried out with potential organ donors, victims of head injury, stroke, and central nervous system cancer in the State of Sergipe, demonstrated that 33.6% of them presented BD and 66.4% CA[11]. Although the study was carried out only in potential donors with neurological diseases, donors with CA are also the majority in the present study.

There was one case of a living donor who, at the age of 12, suffered a spontaneous enucleation because of an orbital lymphangioma, and then his left cornea was donated. There have been no reports in the literature about living donors of eye tissues.

When the variables gender, age, death cause and diagnosis were compared, there have been similar results among donors whose cornea presented rejection after transplantation, and those that did not present it, which seems to indicate these variables did not influence the rejections that occurred in the studied period.

The rejection index found in the present study is lower than that found by other studies. However, when the profile of the recipient that presented rejection was checked, some similarities with previous studies could be found[2,12-13].

When the epidemiological profile of cornea transplanted patients was assessed, Peña et al. observed that Bullous keratopathy is more frequent in elderly patients with mean age of 75.9 years. This can explain the greater frequency of this diagnosis in the present study, considering that almost half of the recipients of the sample were elderly patients[13].

It is observed that 20.5% of the patients that presented graft rejection presented it again after the new transplant. This finding seems to show that patients that present a first rejection tend to present new rejections and, in these cases, graft loss can be related to factors from the patient (body, life habits) rather than the quality of the transplanted cornea.

Regarding surgical classification, the emergency criterion was a little bit more frequent in those patients that present rejection. According to the Rule number 2.600/2009 that approves the technical regulation of the National System of Transplantation (SNT), recipients that develop primary failure up to 90 days after transplantation is carried out become emergency criterion[14].

Even though in the assessed period nurse professionals had a smaller number of procurements compared to other professionals, it was seen that in percentage, the

corneas procured/harvested by nurses presented a lower rejection index, thus showing the contribution of these professionals in the reduction of this index.

Cornea assessment in the eye banks is important for the success of transplantation because it minimizes the chances of complications[4]. The results of the present study demonstrate that, among corneas assessed by a BTOC, those harvested by nurses had a better use compared to those harvested other professionals.

CONCLUSION

The results of the present study led us to conclude that, after the work of nurses as procurement agents, there has been a reduction in the transplant rejection indexes, as well as a better use of the corneas procured/harvested in Sergipe, thus proving the contribution of nurses in the process of cornea procurement and transplantation in the State.

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