

# Organ transplantation scandal influencing corneal donation rate

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## Abstract

• **In the majority of countries, there is a shortage of donor corneas for corneal transplantations. This study investigated the impact of organ transplantation scandals on corneal donation rate at the University Hospital Tübingen. Each deceased patient was considered as a potential corneal donor. An ophthalmic resident handled with stable methods of procedures the corneal donor procurement from 2009 to 2015. The rates of corneal donation were examined and analyzed. Among the 5712 hospital deaths, consent for corneal donation was obtained in 711 cases. The mean annual corneal donation rate was 12.4%. Since 2009, the donation rate per year could be increased with exception of 2013 and 2015. In the end of 2012 and 2014 two huge organ donation scandals were known in Germany. In the following years 2013 and 2015 corneal donation rate decreased significantly ( $P=0.0181$  and  $P=0.0006$ ). We concluded that transplantation scandals have a significant impact on corneal donation rate. Improving professional's performance through full transparency and honesty is very important to earn trust of potential donors and their families.**

• **KEYWORDS:** cornea; corneal donation; tissue procurement; transplantation scandal; public trust

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## INTRODUCTION

The first visually successful human corneal transplant was performed 111 years ago, in 1905, by Dr. Eduard Zirm<sup>[1]</sup>. Corneal transplant is the most successful among all organ transplant procedures. Corneal diseases are a major cause of blindness worldwide. In most of these cases keratoplasty can help to restore or improve the vision. However the number of corneal transplants done is far less than required due to the enormous lack of corneal donation<sup>[2]</sup>. The acquisition of donor corneas is based on sufficient staff levels of the eye bank team<sup>[3]</sup>, interaction between intensivists and the staff of the responsible eye bank<sup>[4]</sup> and the previous informed consent from the donor according to German law. If the previous informed consent is missing, a relative or partner may give consent, but may not contradict any known wishes of the donor<sup>[5]</sup>.

In recent years, there have been publications<sup>[6-12]</sup> about two vast German transplantation scandals which have reduced public support for organ and tissue donation. Several centers with wait-list manipulations have been uncovered in the end of 2012. The criteria for organ allocation have been incorrect reported to Eurotransplant, the central office that creates waiting lists, in order of receiving an organ faster for their patients on the waiting list<sup>[10-11]</sup>. In the end of 2014 at the German Heart Center in Berlin a cardiologist has been accused of giving preference to some heart transplant patients. Some were given extra doses of drugs to change their status on the transplantation list. This further transplant scandal shocked Germany again<sup>[12]</sup>. These two German transplant scandals have resulted in a mistrust of transplantation. Confronted with a perceived decline of corneal donors we determined to evaluate the impact of transplant scandals on corneal donation rate at the University Hospital Tübingen.

## METHODS

From January 2009 to December 2015 medical records from every deceased patient at the University Hospital Tübingen with approximately 1559 beds were analysed retrospectively. During the whole study period an ophthalmic resident handled on a full-time basis the donor acquisition without changing the procedures. For more details on the donor screening and acquisition see Röck *et al*<sup>[2]</sup>. The annual corneal donation rate per 100 deaths were calculated and analyzed. This study adhered to the tenets of the Declaration of Helsinki.

**Statistical Analysis** Statistical analysis of the results was performed using the *t*-test. Statistical analysis of the data was conducted using the Statistical Packages for the Social Science (SPSS 18.0). Quantitative variables were expressed as mean±standard deviation (SD).  $P<0.05$  was considered to be statistically significant.

### RESULTS AND DISCUSSION

This investigation included 5712 deaths on the wards at the University Hospital Tübingen. Consent for corneal donation has been given in 711 cases. The female-male ratio was 39:61. The mean donor age of cornea donors was 70y (SD 14y, range 16-93y). Three-quarters of donors were 60y of age and older. The mean annual corneal donation rate was 12.4% (range: 8.7%-17.8%). The number of cornea donors developed from 64 of 738 deceased in 2009 to 79 of 783 deceased in 2010 to 93 of 779 deceased in 2011 to 124 of 829 deceased in 2012 to 96 of 856 in 2013 to 150 of 844 deceased in 2014 to 105 of 883 deceased in 2015, respectively. The corneal donation rate was 8.7% in 2009, 10.1% in 2010, 11.9% in 2011, 15.0% in 2012, 11.2% in 2013, 17.8% in 2014 and 11.9% in 2015, respectively.

The maximal corneal donation rate was reached in 2014 (17.8%), compared with the lowest in 2009 (8.7%). Since 2009, the donation rate per year could be increased with exception of 2013 and 2015. In the end of 2012 and 2014 two huge transplantation scandals were known in Germany. In the following years 2013 and 2015 corneal donation rate decreased significantly ( $P=0.0181$  and  $P=0.0006$ ).

In earlier reports we described different factors which lead to an imbalance between the supply and the demand for donor corneas. One of the leading factors include the refusal to donate<sup>[2]</sup>. The main reasons for refusal by the potential donor's next of kin include fear of face mutilation during eye removal, religious beliefs, lack of confidence in the health care system and the deceased patient wishes for nondonation. Our study group showed another important factor limiting corneal donation: failures of identification and notification regarding potential cornea donors, which is mostly due to an insufficient number of staffs in the eye bank team<sup>[3]</sup>.

This investigation illustrates the impact of transplantation scandals on corneal donation rate in 5712 consecutive hospital deceased at a German University Hospital. In the end of 2012 and 2014 two vast German transplantation scandals have reduced trust for organ and tissue donation<sup>[6-12]</sup>. Especially at this time mass media, like newspapers, radio, television and internet reported repeatedly on the scandal. In the following years 2013 and 2015 the corneal donation rate decreased significantly at the University Hospital Tübingen ( $P=0.0181$  and  $P=0.0006$ ). Already Schrem and Kaltenborn<sup>[13]</sup> showed a significant decline of organ donations in Germany attributable

to transplant scandals. The number of tissue donors in Germany decreased by 11% from 5697 in 2012 to 5093 in 2013<sup>[14]</sup>. This percentage reflects our experience with cornea donors. The number of cornea donors at the University Hospital Tübingen decreased by 23% from 124 in 2012 to 96 in 2013 and by 30% from 150 in 2014 to 105 in 2015. The situation was similar to that in organ donors. After the huge German transplantation scandal in the end of 2012 the number of organ donors at the University Hospital Tübingen decreased by 33% from 12 in 2012 to 8 in 2013, the number of organ donors in Baden-Württemberg decreased by 18% from 119 in 2012 to 98 in 2013 and the number of organ donors in Germany decreased by 16% from 1046 in 2012 to 876 in 2013<sup>[15]</sup>. In Germany in 2011, 6976 corneas were placed in tissue culture, 8024 in 2012 and 7920 in 2013, respectively<sup>[15-16]</sup>. These numbers correspond to an increase of 15% from 2011 to 2012 and a decline of 1% from 2012 to 2013. Although the corneal donation rate at the University Hospital Tübingen decreased significantly to 11.2% in 2013, it increased to 17.8% in 2014. This was because different promotion campaigns were done to encourage public trust and awareness about organ donation and transplantation inside and outside the University Hospital.

Because of not changing the setting of corneal donor procurement and without changing processes in the whole study period we assume that the significant decline had been caused by organ donation scandals. The decrease may have been a protest against wrongful distribution and has showed a loss of trust by potential donors and their families.

In summary, our investigation illustrates that organ donation scandals have a significant impact on corneal donation rate. It seems that increasing professional's performance is very important to earn public trust and improve corneal donation rate. Furthermore the knowledge and awareness of people about corneal donation through educational and enlightenment work is necessary to meet the scarcity.

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