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Socioeconomic factors as predictors of organ donation



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ABSTRACT

Background: Despite numerous initiatives to increase solid organs for transplant, the gap between donors and recipients widens. There is little in the literature identifying socioeconomic predictors for donation. We evaluate the correlation between socioeconomic factors and familial authorization for donation.

Methods: A retrospective analysis of adult potential donor referrals between 2007 and 2012 to our organ procurement organization (OPO) was performed. Potential donor information was obtained from the OPO database, death certificates, and the US Census Report. Data on demographics, education, residence, income, registry status, cause and manner of death, as well as OPO assessments and approach for donation were collected. End point was familial authorization for donation.

Results: A total of 1059 potential donors were included, with an overall authorization rate of 47%. The majority was not on the donor registry (73%). Younger donors (18–39 y: odds ratio [OR] = 4.9, $P < 0.001$; 40–60 y: OR = 2.1, $P < 0.001$), higher levels of education (college: OR = 2.5, $P = 0.005$; graduate studies: OR = 3.9, $P = 0.002$), prior listing on the donor registry (OR = 10.3, $P < 0.001$), and residence in counties with lower poverty rates than the US rates (OR = 1.7, $P = 0.02$) were independently associated with higher authorization rates. Decoupling (OR = 3.1, $P < 0.001$) and donation first mentioned by the local health care provider (OR = 1.8, $P = 0.01$) were also independently associated with higher authorization rates.

Conclusions: Donor registration correlated most strongly with the highest authorization rates. These results indicate that public educational efforts in populations with unfavorable socioeconomic considerations may be beneficial in improving donor registration. Collaborations with local providers as well as OPO in-hospital assessments and approach techniques can help with improving authorization rates.

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Image is from the Donor Memorial Wall at the University of Kentucky AB Chandler Hospital.

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Introduction

The need for transplantable organs continues to increase faster than the supply of organs. As of April 27, 2016, there are 120,963 patients in need of solid organ transplant in the United States.¹ There has unfortunately been a relative stagnation of potential organ donors nationally since 2007.²

The organ shortage continues to be a worsening public health crisis. Numerous programs such as the Organ Donation Breakthrough Collaborative and Transplant Growth and Management Collaborative have been implemented to identify best practices associated with increases in organ donation.³ In addition, aggressive management of potential organ donors, as well as the use of resuscitative techniques, has helped maintain the donor pool and salvage of transplantable organs.^{4,5} Despite these initiatives and changes in the medical management of donors, the gap between donors and recipients continues to widen. This leads to several questions regarding the organ donation. Have organ procurement organizations (OPOs) maximized the number of potential donors? Have OPOs and transplant providers maximized collaborations to educate the public about organ donation? While these are questions that are examined elsewhere, we attempted to answer the question of whether transplant providers have identified at-risk populations for poor familial authorization rates for organ donation.

Most decedents eligible for organ donation are not registered organ donors, and their families are approached for authorization for organ donation.^{6,7} Studies have attempted to identify specific barriers that may negatively impact rates of familial authorization for donation. Some studies have indicated that the technique, timing, sequence, and who approaches the family of the decedent for consent significantly impact the ability to obtain authorization.^{8,9} Other studies have examined decedent demographics and social characteristics that are associated with familial authorization for donation. Non-Caucasian race has repeatedly been associated with nondonation, whereas medical causes of death have also been shown to be associated with nondonation.^{3,10-12} Unfortunately, there is a gap in the literature regarding other socioeconomic predictors of donation. It is therefore important to identify the characteristics of eligible decedents who are unlikely to donate. Identification of these characteristics can allow sufficient resource allocation to prehumous phase and an optimal familial approach in the posthumous phase.

The purpose of this investigation is to examine a large OPO decedent referral database. The goal is to measure the association between socioeconomic factors and familial authorization, while controlling for variables known to be associated with familial authorization (e.g., race and approach factors). We hypothesize that lower socioeconomic status and reduced education are associated with decreased familial authorization.

Methods

A retrospective analysis of referrals to our local OPO, the Kentucky Organ Donor Affiliates (KODA), between May 2007

and December 2012 was performed. All potential organ donor referrals, aged 18 y or older, were included. Candidate donor characteristics were extracted from the KODA database. Variables collected included age, gender, ethnicity, registry status, hospital where the donor died, cause of death, manner of death (medical or trauma), which family member(s) was approached for donation, who first mentioned donation (family, local provider, or OPO), whether or not the family had an understanding of the hopelessness of their loved one's situation (nonsurvivable injury), and whether or not decoupling of the pronouncement of death from the approach for donation occurred.¹³ Family understanding of hopelessness was assessed by the OPO by asking the decedent's family what they understood about the condition of their loved one. If it was deemed that the family did not comprehend the non-survivable condition, then the process for authorization was halted, and the family was approached later.

Additional information about the potential donor was obtained from the death certificates from the Kentucky Office of Vital Statistics and West Virginia Health Statistics Center. These documents provided candidate donors' home address, marital status, education level, leading cause of death, and manner of death. Home address was used to determine county of residence, geographic area of residence (Appalachia versus non-Appalachia), and mileage from donor residence to the hospital of death. Additional data were collected from the US Census Report, which included median county household income and percentage of individuals below the poverty line. The median county household income was used as a surrogate for decedent family income in the given year of the donor death. The percentage of individuals below the poverty line was obtained in the given year of the donor death.

The primary outcome of the analysis was familial authorization for organ donation. A case-control comparison was performed between potential donors who had authorization for donation and those whose authorization was declined. A univariable analysis for all variables was performed using the Student's *t*-test for continuous variables and Pearson's χ^2 test with Yates correction for categorical variables. Variables with a *P* value < 0.05 were entered into the multivariable logistic regression analysis. Statistical significance was set at *P* < 0.05. The institutional review board was consulted, and it was determined that the study qualified for a waiver of informed consent. This was due to the fact that a retrospective analysis was performed on decedents, and no family members were contacted to obtain any additional information beyond data already collected by KODA and available in death certificates.

Results

During the 6-y study period, there were 1059 potential organ donor referrals. Table 1 summarizes the demographics of our study population. There were a higher percentage of males in our study. Our study population was predominantly Caucasian. The average age of the potential donor was 48 ± 15 y. Most of the patients in our population had at least a high school level of education, followed by college level. The median household income was $\$39,915 \pm 8667$, with the majority

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