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BRIEF REPORT

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Detection of occult disease in tissue donors by routine autopsy

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Abstract The transmission of infectious and neoplastic diseases is a potential risk of tissue allografting. In this study, we analyzed the occurrence of occult disease in tissue donors as detected by standard screening and autopsy. Whereas 18% of the potential donors initially evaluated were eliminated on the basis of their medical and social histories, laboratory screening and autopsy revealed that an additional 9% of tissue donors had undetected, transmissible disease that prohibited tissue donation. This report emphasizes once again the risk of occult disease being transplanted with grafts and the need for autopsy to reduce the likelihood of this occurring. If donor selection, appropriate screening tests, and autopsy are carefully carried out, the risk of transmitting diseases from tissue allografts can be kept to a minimum.

Key words Autopsy, transmission of disease · Tissue donors, transplantation · Transplantation, tissue donors · Transmission of disease, autopsy

Introduction

The transmission of occult disease from donor to recipient is an undesirable result of organ and tissue transplantation. Like vascularized transplants, tissue allografts are able to transmit infectious and neoplastic diseases [1–3, 5, 6, 9, 14, 15]. It is the prime responsibility of the tissue bank to select donors correctly and to perform careful biological screening. Although standard screening has minimized the risk of transmitting diseases from tissue allografts, it is not sensitive enough to detect occult diseases [3]. Autopsy is generally considered a useful and necessary procedure. However, the need to perform an autopsy in order to avoid the transmission of severe diseases is not fully recognized and, consequently, autopsy is frequently not carried out on cadaveric donors [2] . In this study, we analyzed the occurrence of occult disease in tissue donors as detected by clinical and laboratory examination, including autopsy.

Subjects and methods

From January 1994 through June 1997, the Transplant Program Coordinators and the Tissue Bank at the Hospital Central de Asturias evaluated 66 patients using European Association of Tissue Banks (EATB) standards and guidelines [8, 9]. The suitability of a tissue donor was determined by qualified physicians on the basis of medical and social history, physical examination, laboratory screening, and autopsy. Of the 66 patients initially evaluated during that period, 12 patients (18%) were eliminated because their clinical histories revealed different pathological conditions that were potentially transmissible. A full postmortem examination was performed on all of the 54 remaining patients. Laboratory screening included serological tests for syphilis, anti-HIV 1–2, HIV 1 Ag (P. 24), HBsAg, anti-HBs, anti-HBc, and anti-HCV.

Results

Of the 54 patients examined, 5 (9%) who satisfied all of the criteria for tissue donation were found to have unde-

tected, potentially transmissible diseases, thus preventing them from becoming tissue donors. Their diseases included hepatocarcinoma, lymphocytic lymphoma, medullary thyroid carcinoma, hemorrhagic gastritis of probable viral origin, and HBsAg-positive ($n = 1$ for each disease).

The donor with hepatocarcinoma was a 48-year-old man who died of a subarachnoid hemorrhage and who had an antecedent history of alcoholism. Autopsy revealed a hepatocarcinoma without evidence of metastasis.

The donor with lymphocytic lymphoma was a 42-year-old man who died of a cerebral trauma. At autopsy, a low-grade lymphocytic lymphoma involving the spleen, liver, and peripancreatic lymph nodes was discovered.

The donor with the medullary thyroid carcinoma was a 39-year-old man who died of an acute myocardial infarction. Autopsy showed that the carcinoma was confined to the thyroid gland.

The donor with hemorrhagic gastritis of probable viral origin was an 18-year-old male victim of a drowning. Autopsy revealed hemorrhagic gastritis with intranuclear inclusions. It was thought to be of viral origin although it could not be confirmed by positive cultures.

The donor with HBsAg-positive was a 50-year-old man who died of an acute myocardial infarction. In addition to seropositivity, autopsy revealed hepatocytes with a ground glass appearance. Immunohistochemical examination showed cytoplasmic positivity for HBsAg.

The mean age for the entire group was 41 years (range 15–77 years) and did not differ from that of the group of five tissue donors with positive findings. The major causes of death were cerebral trauma, acute myocardial infarction, and cerebral hemorrhage.

Tissues were harvested from the 49 remaining donors, resulting in the procurement of 255 bones, 92 corneas, 71 tendons, 56 arteries, 5 urethras, 5 fascia lata, 4 heart valves, and 91,910 cm^2 of skin.

Discussion

Implantation of tissue allografts in every field of surgery has greatly increased in recent years, and innovative applications of allografts have been developed [10, 13]. However, in spite of its popularity, the use of tissue allografts is not completely free of health risks [11]. Transmission of infectious and neoplastic diseases is a major concern for tissue banks. Health risks for the recipient of an allograft can be minimized by strict adherence to stringent guidelines for appropriate donor selection and by thorough biological screening and retrospective screening of the donors [1, 4]. Despite these guidelines, transmission of disease during transplantation still occurs [7].

Autopsy has been suggested to further increase the sensitivity of detection of transmissible diseases [5, 9, 14]. Yet, autopsy is not required under all standards promulgated by the tissue and organ transplant community. One of the arguments against routine autopsy is that it might have a detrimental effect on organ and tissue donation. However, there is no solid evidence to support this argument. In our hospital, when permission for tissue donation is obtained, families are always amenable to a full autopsy. It should, of course, be said that Spain has the highest rate of organ donation in the world, and the principality of Asturias has one of the highest in the country (34.6 donors per million inhabitants in 1996) [12]. Therefore, we believe that the routine autopsy of tissue donors does not have any detrimental effects on tissue donation.

In our opinion, despite the fact that stringent guidelines do exist and have minimized the transmission of disease, further pathological exploration is needed to detect donors with potentially transmissible diseases that are not revealed by history, clinical data, or screening techniques [8]. Following this policy, we have found a 9% incidence of clinically undetectable diseases prohibiting tissue donation. In a study by Burgess et al. [2], 3 of 54 tissue donors (5%) presented positive findings on autopsy. However, the investigators recognized that the incidence might actually have been higher since not all of their tissue donors had undergone autopsy.

The risk of transmission of occult diseases differs between living, brain-dead, and cadaveric donors with respect to the screening of donors. In every case, appropriate donor selection must be based on the donor's medical history and on extensive laboratory assays at the time of procurement. In the case of tissue donation after death, there is an additional risk due to the inability to take first-hand medical and social histories. In these cases, an autopsy would appear to be mandatory in order to detect occult diseases of unknown etiology. If these guidelines were to be followed, the risk of transmitting occult disease through tissue implantation would be much lower than they presently are.

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