

INVITED COMMENTARY

# Liver transplantation from donors with positive blood cultures: increased risk of graft failure or opportunity to expand the donor pool?

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Organ transplantation is considered the therapy of choice for end-stage organ failure. However, the growing gap between the number of patients waiting for transplantation and available organs continue to be the number one issue facing the transplant community. As a consequence, the major focus in liver transplantation has been developing strategies to increase available donors, including the use of live donor liver segments, splitting deceased donor grafts for two patients, and the use of organs procured from donors after circulatory death (DCD). In addition, several groups continue to explore ways in which outcomes can be improved utilizing organs from ‘extended criteria’ donors, including donors with infections or malignancies [1,2]. Liver transplantation using blood culture positive donors (BCPD) has allowed a significant expansion of the donor pool. Although organs from bacteremic donors can be transplanted without complications, if appropriate anti-infective agents are applied in the donor before organ procurement and in the recipient post-transplant, transmissions have been reported [3–6]. Furthermore, an increasing number of patients admitted to ICUs are exposed to infections with MDR organisms, in

particular ESBL-producing enterobacteriaceae, carbapenem-resistant *Acinetobacter baumannii* (CRAB), multidrug resistant *Pseudomonas aeruginosa*, carbapenem-resistant *Klebsiella pneumoniae* (CR-KP) and other carbapenem-resistant enterobacteriaceae (CRE). Carbapenem-resistant Gram-negative bacteria are of particular concern because of their difficulty to treat, which results in significant morbidity and mortality, particularly among solid organ transplant recipients [7]. The current availability of new drugs with activity against some of these pathogens might be helpful in the future in controlling infections transmitted by organ transplantation, allowing a further extension to the use of bacteremic donors [8].

Despite a potential risk of disease transmission, the outcome of recipients of organs from donors with bacteremia has not been associated with reduced graft or patient survival. In a recent paper, analyzing the data from the United Network for Organ Sharing (UNOS) registry in the United States it was shown that transplanting livers from BCPD was independently associated with decreased graft survival. BCPD were more likely to be older, female, black, diabetic, hypertensive, and obese

compared to non-BCPD. However, results remained significant in propensity-matched analysis. Despite a decreased graft survival, the authors did not find significant differences in patient survival between study groups [9]. These findings are somewhat surprising and not shown by the same group in kidney transplant recipients where the use of organs from BCPD was only associated with delayed graft function [10].

Unfortunately, the UNOS database does not collect information on the specific organism isolated from blood cultures, on the time elapsed from positive donor blood culture and the date of transplantation, antimicrobial agents used in the donors and in the recipients, infection severity and donor to recipient transmission. It is therefore difficult to generalize the results. What is the reason for reduced graft survival in liver recipients of organs from bacteremic donor is not addressed in the paper and remains unknown. We can speculate that this might be due to liver toxicity of the antimicrobial drugs used in the donor and in the recipients, to the circulatory, hormonal and metabolic

changes that occur in brain death or to other unknown mechanisms.

The Authors conclude that as liver transplantation is often a lifesaving operation and there is a large gap between supply and demand for livers, decreased BCPD graft survival without a significant effect on patient survival would be considered acceptable. Although a large number of patients have been included in the study I would recommend caution in interpreting these results to avoid wasting of good organs for life saving procedures. I think that a well-designed, large, multicenter, prospective study is urgently needed for defining the real risk of reduced graft patient survival using liver from BCPD.

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### Conflict of interest

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