Liver transplantation. Expectation with MELD score for liver allocation in Brazil

Transplante hepático. Expectativas com escore MELD para alocação de fígado no Brasil

Andreaza Correa Teixeira, Fernanda Fernandes Souza, Gustavo de Assis Mota, Ana de Lourdes Candolo Martinelli, Ajith Kumar Sankarankutty, Orlando de Castro e Silva

1. Study performed in the Liver Transplantation Unit of the Division of Gastroenterology of the Department of Surgery and Anatomy of Ribeirão Preto Faculty of Medicine - University of São Paulo - (FMRP-USP), Brazil.
2. Fellow Master degree, Member of the Liver Transplant Program of the Division of Gastroenterology of the Department of Surgery and Anatomy, (FMRP-USP), Brazil.
3. MD, Assistant of Division of Gastroenterology of the Department of Surgery and Anatomy, (FMRP-USP), Brazil.
4. PhD, Professor of the Department of Medicine, (FMRP-USP), Brazil.
5. PhD, Professor of the Department of Surgery and Anatomy, Division of Gastroenterology. Operational coordinator of the Liver Transplant Program, (FMRP-USP), Brazil.
6. Full Professor, Head of Division of Gastroenterology of the Department of Surgery and Anatomy, Coordinator of the Liver Transplant Program, (FMRP-USP), Brazil.

ABSTRACT
Liver transplantation represents the most effective therapy for patients suffering from chronic end-stage liver disease. Until very recently, in Brazil, liver allocation was based on the Child-Turcotte-Pugh score and the waiting list followed a chronological criterion. In February 2002 the Model for End-stage Liver Disease (MELD) score was adopted for the allocation of donor livers in the US. After that change, an increased number of patients with more severe liver disease was observed, although there was no difference in 1-year patient and graft survival. A reduction in waiting-list mortality was also observed. In Brazil, the MELD score was adopted on May 31st, 2006. Good results are expected regarding the new criterion for allocation.

Key words: Liver Transplantation. MELD Score. Organ Allocation.

RESUMO
O transplante de fígado representa o tratamento mais eficaz disponível no momento para pacientes com doença hepática crônica terminal. Em fevereiro de 2002 o escore – Model for End-stage Liver Disease (MELD), o qual determina a gravidade da doença com estimativa de mortalidade em três meses, foi implantado para alocação de doadores de fígado nos Estados Unidos. Conseqüentemente foi observado um maior número de pacientes graves transplantados, com redução de mortalidade na lista de espera e não houve diferença de sobrevida em um ano de paciente e enxerto. Até recentemente no Brasil a alocação de órgãos era baseada no critério cronológico de acordo com a inclusão em lista de espera para transplantamento de fígado, donador cadáver. Há poucos dias (31 de maio de 2006), foi publicada a portaria que institui o critério de gravidade para alocação de fígado. Expectativas quanto aos resultados e o impacto dessa mudança na realidade brasileira são aguardados.

Descritores: Transplante de Fígado. Escore MELD. Alocação Órgãos.
centers in the country, with 64 active teams. Patient selection for the allocation of cadaveric donor livers is currently based on decree nº 3,407 of August 5, 1998, published in the Official Record 149 of August 6, 1998. The minimum requirements are: a) identity of the ABO blood system between donor and recipient; b) origin, when donor and recipient weigh less than 40 kg; c) time since enrolment on the unified list. In 2004, the waiting list for a cadaveric donor in Brazil was 6,313 enrolled candidates, with 2,964 additions during that year alone. During the same year, 935 liver transplants were performed in Brazil, with 757 organs being obtained from cadaveric donors. A total of 1,789 patients were enrolled in the state of São Paulo, in 2004, with 351 liver transplants from cadaveric donors and a waiting list mortality rate of 18.5%. In 2005, a total of 295 liver transplants from cadaveric donors were performed in the same state. However, by the month of May 2006, the waiting list for the state of São Paulo was 4,102, corresponding the longest list in the country. This represents an increase in the number of new cases included, which exceeds the number of transplants performed, leading to a longer time on the waiting list. In Brazil as a whole, the average time on the waiting list is about 18.8 months, with a waiting list mortality rate of about 30%. In the state of São Paulo, time on the waiting list is approximately 51 months. It is clear that available organs are insufficient to satisfy the demand. This scenario showing the increasing need for organs has motivated debates in Brazil and in the whole world regarding the criteria for graft allocation. These discussions are important for a more equitable organ distribution in a situation of scarcity, until measures are adopted to improve organ acquisition. Current strategies for the optimization of organ acquisition include the use of reduced grafts, sequential transplant, and the use of marginal grafts, in addition to transplants between living subjects, a surgical modality first described in Brazil in 1988 by Silvano Raia, in the state of São Paulo. We believe that cadavers are the best source of liver grafts since, in this way; a healthy individual is not submitted to the risks of major surgery. Thus, the use of a cadaver donor is indicated for all liver transplants and, for this to become a reality, we need to improve our organ procurement performance. Up to 100 patients per million inhabitants are expected to suffer brain death each year as a consequence of accidents or of intracerebral haemorrhage. This shows that there are large numbers of potential organ donors. Developed countries are able to obtain 20 to 40 donors per million inhabitants per year and countries close to Brazil, such as Argentina and Chile, achieve a rate of 10 to 12 donors per million inhabitants per year. In our country, the rate obtained is 3.7 donors per million inhabitants per year, a value much lower than that reported for the above countries. Statistical studies demonstrate a very low utilization of potential donors, i.e., patients admitted to Intensive Care Units with a diagnosis of brain death. Less than one quarter of these patients are converted to effective donors. The main reason is the lack of authorization for organ removal by the family, and the second main obstacle is the presence of medical contraindication regarding the potential donor, as a consequence of a delayed diagnosis of brain death or of inadequate clinical maintenance, causing the organs to be inappropriate for transplantation. The ideal time for the indication of liver transplantation is a difficult decision. The indication should occur at the time when the risk of death due to complications of liver disease exceeds the immediate or long-term mortality rate after transplantation, which in Brazil is about 35%. In the state of São Paulo, the actuarial survival for recipients of a liver transplant from a cadaver donor was 53.8% in 2005. To date, in our country the minimum seven point score of the Child-Turcotte-Pugh classification has been used for the indication of liver transplantation. When the score is less than seven, the patient should present at least one of the following complications: upper digestive haemorrhage with two or more distinct episodes and the need for blood replacement, hepatopulmonary syndrome with clinical manifestations, or portal-systemic encephalopathy. However, the Brazilian Health Ministry decreed, recently, that a new criterion for allocation of liver from cadaveric donors instituted in the country. The Model for End-stage Liver Disease formula used to calculate the severity score is as follows: 

\[ 3.8 \log_2 (\text{total bilirubin mg/dl}) + 11.2 \log_2 (\text{International Normalized Ratio [INR]}) + 9.6 \log_2 (\text{creatinine mg/dl}) + 6.4. \]

Minimal values for variables are set at 1.0 for calculation purposes. The maximal serum creatinine level considered within the MELD score formula is 4.0 mg/dl. At the University Hospital of the Faculty of Medicine of Ribeirão Preto, University of São Paulo, 79 medical files were availed for analysis of Child-Turcotte-Pugh and MELD scores in January 2005. One year later, the deaths of patients on wait for liver transplantation and the number of transplantations performed in 2005 were identified. Sixty-three (80%) of 79 patients on the waiting list for liver transplantation were Child B or C. The average MELD score was 10 ± 5 for Child A patients, 13 ± 3.4 for Child B patients and 21 ± 4.3 for Child C patients. Nine (11%) deaths on the waiting list were notified in 2005. Of these, one patient was Child B and MELD 10, while the others were Child C, with an average MELD score of 21 ± 3.8. Twelve (15%) patients received cadaveric orthotopic liver transplantation (OLT). During the study period, half of the Child C patients on the waiting list died. The patients with a MELD score higher than 20 shared a similar fate. Among the patients with a MELD score higher than 20, 40% died on the waiting list, whereas 12.5% were transplanted. Thus, mortality on the waiting list depends on the length of waiting time as well as on the severity of the liver disease at the time of inclusion. We observed a mortality rate of 11% in our waiting list, these being only the deaths notified to the Sao Paulo State Transplant System, which may represent a slight underestimate. On the other hand, among the deaths notifies, Child C patients and those with an average MELD score of 21 constituted the majority. Nevertheless, it is important to mention that the MELD scores were not calculated at the time of inclusion, but at varying times while on the waiting list. In the US, the MELD system for liver allocation started to be in force in February 2002 and significant changes in the dynamics of organ allocation have been observed since then. An increase in the number of patients with more severe disease was observed, but there was no difference in 1 year survival compared to previous criteria. In addition, waiting list mortality rate was reduced. In Brazil, a recently published
decree instituted the criterion of disease severity for liver allocation, which started to be valid 30 days after publication. Analysis of the results and impact of change on the Brazilian reality is currently underway.

References


Correspondence:
Orlando de Castro e Silva Jr.
Rua Campos Salles, 809/9º andar
14015-110 Ribeirão Preto - SP Brazil
orlando@fmrp.usp.br

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