Heart Transplantation in Latin America: Opportunities and Limitations

Fabio B. Jatene
Full Professor of Cardiovascular Surgery
Medical School, University of São Paulo - Brazil
No disclosures
Heart transplant situation in the world

- Current profile of donors and recipients
- Indications and Status of Cardiac Transplantation in Brazil
- Management model
- Challenges and Perspectives
The number of HTx have stabilized over the recent years.
Number of cardiac transplants per million population (pmp)

- USA 8 pmp
- Spain 6 pmp
- Brazil 1.7 pmp
NICM = Non-ischaemic cardiomyopathy
ICM = Ischemic cardiomyopathy
Current profile of donors and recipients

Heart transplant situation in the world

Indications and Status of Cardiac Transplantation in Brazil

Management model

Challenges and Perspectives
Adult Heart Transplants
% of Patients Bridged with Mechanical Circulatory Support* by Year and Device Type

2016

* LVAD, RVAD, TAH, ECMO

JHLT. 2015 Out; 34(10): 1244-1254
JHLT. 2016 Oct; 35(10): 1149-1205
Indications and Status of Cardiac Transplantation in Latin America

Heart transplant situation in the world

Current profile of donors and recipients

Management model

Challenges and Perspectives
### Heart Transplant in Latin American Countries

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<tr>
<th>Year</th>
<th>Brazil</th>
<th>Argentina</th>
<th>Colombia</th>
<th>Mexico</th>
<th>Peru</th>
<th>Chile</th>
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**Diagram:**
- Brazil
- Argentina
- Colombia
- Mexico
- Peru
- Chile
- Uruguay

**Data Source:** Courtesy of Juan Mejia
This picture was taken at the symposium in Montevideo, Uruguay last December. This symposium was commemorating the 100TH HTx
## Estimated Need vs. Transplants Performed – Brazil, 2016

<table>
<thead>
<tr>
<th>Annual estimated need and number of TX</th>
<th>Cornea</th>
<th>Liver</th>
<th>Kidney</th>
<th>Heart</th>
<th>Lung</th>
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<td>Estimated need</td>
<td>18,401</td>
<td>12,267</td>
<td>5,111</td>
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<td>Transplants performed</td>
<td>14,534</td>
<td>5,492</td>
<td>1,880</td>
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</table>

*Brazilian Association of Organ Transplantation, Dec/2016*
Number of effective donors (pmp) in 2015 (46 countries)

Spain = 35.9 pmp
USA = 27 pmp
Brasil = 14.1
Chile = 6.7
Argentina

Unfortunately from Argentina not so good news, the donation rate fell for the first time in 10 yrs in 2016, and this obviously effected the number of HTx.

http://www.perfil.com/ciencia/la-tasa-de-donantes-de-organos-cae-por-primer-vez-en-10-anos.phtml

Courtesy of Juan Mejia
Donation of organs will be made mandatory in Colombia

The president of Colombia, Juan Manuel Santos, sanctioned this law that makes it compulsory to donate organs in the country, except in cases where people protest otherwise.

May, 2016


Courtesy of Juan Mejia
Chile

Modification to Law No. 19.451, in 2013
Regarding the determination of those who can be considered donors of organs.

In the same way as Colombia, Chile has modified a law regarding organ donation, and now everyone is considered a donor after death. Except those who have protested otherwise.
Transplant centers / Survival Curve in 2016

31 centers

> 20/year: 6

Brazilian Association of Organ Transplantation, Dec/2016
Limitations of Cardiac Transplant

Scarcity and Quality Donor
- Delay in the recognition of brain death
- Inadequate management of potential donors
- High doses of vasopressors
- Inadequate structure to evaluation (Echo not available)

Structure Teams
- Cardiac surgeon and clinicians not exclusively dedicated to transplant

Recipient
- Late referral
- Difficult to obtain circulatory assist devices
Management model

Heart transplant situation in the world

Current profile of donors and recipients

Indications and Status of Cardiac Transplantation in Brazil

Challenges and Perspectives
How to move forward on these issues to increase the number of transplants?
Heart Institute (InCor):
- The largest Heart Transplant Center of Latin America
- 790 Adult and Pediatric Heart TX since 1985
- 130 in patients with Chagas disease
- 60-70 Adult and Pediatric Heart Transplants/year

Development of centers to improve clinical conditions of recipients and to increase the number of viable donors that may have an impact on the number and outcome of transplants.
• Nurse - 24 hours for initial assessment of the donor
• 4 clinical physicians
• 3 surgeons dedicated to heart transplantation
• Donor procurement at distance
• Echocardiography evaluation project
• Perspective of circulatory assist devices as a bridge to transplant
Heart Transplantation Team - InCor-HCFMUSP

Number of Transplants 30-day Mortality

- 2011: 11 patients (45.5%)
- 2012: 16 patients (25.0%)
- 2013: 31 patients (22.6%)
- 2014*: 44 patients (11.4%)

Mortality rate 2016 = 6.8%
Mortality in waiting list

Before HTT: 61.4%  
After HTT: 33.4%

$p=0.001$
No. Heart Transplant – INCOR
32 years – 784 Patients

Number of Transplants

year


0 10 20 30 40 50 60 70 80 90 100

9 13 16 9 10 11 18 16 15 13 10 17 13 12 18 13 8 11 7 21 27 4 15 11 5 4 26 24 24 18 11 16
No. Heart Transplant – INCOR
32 years – 784 Patients

122 Tx
1,12/m
No. Heart Transplant – INCOR
32 years – 784 Patients

- 122 Tx, 1.12/m
- 150 Tx, 1.43/m

Yearly number of transplants from 1985 to 2012.
No. Heart Transplant – INCOR
32 years – 784 Patients

- 122 Tx, 1.12/m
- 150 Tx, 1.43/m
- 277 Tx, 2.30/m
No. Heart Transplant – INCOR
32 years – 784 Patients

122 Tx
1,12/m

150 Tx
1,43/m

277 Tx
2,30/m
No. Heart Transplant – INCOR
32 years – 784 Patients

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Conclusions

- The implementation of a “Heart Transplantation Team” has played an important role in heart transplant results at our institution
  - Increased the number of transplants / year
  - Increased % of grafts utilization
  - Reduced mortality in waiting list
  - Reduced mortality at 30 days post transplant
- Multidisciplinary teamwork has contributed to increase the number of heart transplants and reduce mortality rate

This approach should be used in other centers, where there is space for improvement
Challenges and Perspectives

Heart transplant situation in the world
Current profile of donors and recipients
Indications and Status of Cardiac Transplantation in Brazil
Management model
Training Programs

- Multidisciplinary training project - Messejana hospital was chosen to be the training center for HTx and MCS
- This project started last year with 5 Centers spread Nation wide
- The project can be used outside Brazil in Latin America and in Africa
Long-distance heart capture and Survival

- All adult patients submitted to cardiac TX between January 2013 and December 2014 at InCor were evaluated.

- Patients were analyzed in two groups: short-distance (G1) and long-distance (G2) capture, the latter characterized by cardiac capture performed at a distance greater than 50 km.
Conclusion: Long-distance organ capture is an acceptable and safe option, not resulting in increased morbidity or mortality in our population, despite the longer ischemia time to the heart.
Lack of mechanical circulatory support devices as bridge to TX

Bridge to recovery, decision, TX Destination therapy

MCS paracorporeal and intracorporeal
Mexico

Hospital Infantil de México Federico Gómez (HIMFG) makes the first Bi VAD implantation as BTT made in a child in Mexico

Realizan en México primer trasplante de corazón artificial en un menor  OCT/2016


Courtesy of Juan Mejia
<table>
<thead>
<tr>
<th></th>
<th>PATIENT 1</th>
<th>PATIENT 2</th>
<th>PATIENT 3</th>
<th>PATIENT 4</th>
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</table>

This table shows the early results of the Mexican program using short term temporary support. The patient underwent biVAD implantation with a Mexican temporary pneumatic model named Vitalcor. As you can see after 30 days 3 out of 4 survived.

Courtesy of Juan Mejia
From Peru we have news of a first patient to undergo BiVAD support with Centrimag as bridge to TX. This patient survived and went on to HTx and is doing well. 

Courtesy of Franz Soplopuco. Heart Institute, ESSalud-Lima
Mechanical Circulatory Support – 2011-2016

147 patients

- ECMO n 105
- Rotaflow n 19
- Centrimag n 10
- DAV n 11
- Biopump n 2

21 Transplants (14%)

78 † (53%)

48 (33%) survived
11 months on waiting list

45 days after HTx

MCS as a Bridge to TX / InCor
Profile of heart transplant recipients: INCOR vs. ISHLT Registry

- All adult patients submitted to heart transplantation at the Heart Institute (InCor) Brazil, between 11/01/2010 and 10/31/2013 were evaluated
- Data compared to ISHLT Registry in the period from 2006 to 2012
Development of national technology
Each Latin American country is trying to improve their numbers and results in HTx procedures in different ways. Some by modifying laws in organ donation, while others starting to use MCS devices, including locally designed and manufactured pumps.

Some efforts to increase the number of Centers to perform HTx, like the Tutorial Program in Brazil, has been started. A management model, with the concept of Heart Transplant Center is showing very good results.
Final Considerations

- The heart transplantation team acts on indications, surgical procedures, treatment of the post-transplant complications and follow-up of patients.

- The training, involvement and motivation of each team member are the key to the success and safety of a heart transplantation program. Building a strong and motivated heart team is crucial for any center that plans to start the transplant program.
Celebration 1000 Transplants InCor - 2016
Thank You