



Barriers and Limitations to Access to Liver Transplantation in Latin America

Wellington Andraus, M.D., Ph.D.

Latin America is made up of 20 countries spanning both hemispheres, from Mexico to Chile, that speak romance languages, mostly Spanish and Portuguese. The 92 million km² is home to approximately 610 million people, and it is known for its cultural diversity. There are huge economic and developmental asymmetries between and within countries, leading to large differences in health care provision and investment.¹

Despite the lack of resources in most of the public health systems, liver transplant started relatively early in Latin America: in 1968 in Brazil and 1969 in Chile.² Other countries started their programs only a few years later, at a time when liver transplant was still considered an experimental procedure, the survival rate was poor, and it had many complications related to the technique, rejection, and drug side effects.

The increasing numbers and the consolidation of the transplant programs took a long time, not only because of the lack of good immunosuppressants but also because of economic aspects and the organization of transplant

systems. Some countries have not developed liver transplant programs yet (Table 1).

ACCESS TO LIVER TRANSPLANTATION

The biggest barrier to access is the lack of any liver transplantation program in many parts of the region. None of the Latin American countries classified as lower middle income (Honduras, Nicaragua, Guatemala, and Bolivia) by the World Bank are able to maintain liver transplantation programs, and the rate of liver transplantations carried out per million people is closely correlated with the gross domestic product per capita of each country. The lack of economic development in Central America and parts of South America is a major hurdle to access to liver transplantation.³

Even in countries with established liver transplantation programs, the numbers are modest in most. In some of them, where programs have been implemented, they are frequently interrupted because of financial difficulties and also for the changing political circumstances, combined

Abbreviations: N, number; pmp, per million population.

From the Digestive Organs Transplant Division, Gastroenterology Department, Sao Paulo University School of Medicine, Sao Paulo, Brazil.

Potential conflict of interest: Nothing to report.

Received September 5, 2018; accepted September 11, 2018.

View this article online at wileyonlinelibrary.com

© 2019 by the American Association for the Study of Liver Diseases

TABLE 1. LIVER TRANSPLANTATION BY COUNTRY IN LATIN AMERICA, 2016

Country	N	pmp	Living Donors
Brazil	1880	9.2	158
Argentina	367	8.5	37
Colombia	226	4.7	21
Mexico	178	1.4	3
Chile	89	5.0	9
Puerto Rico	42	12.0	0
Ecuador	31	1.9	0
Peru	23	0.7	2
Cuba	20	1.8	2
Uruguay	15	4.4	1
Costa Rica	13	2.7	2
Panama	11	2.8	0
Dominican Republic	3	0.3	0
Paraguay	6	0.9	0
Venezuela	2	<0.1	1
Bolivia	1	0.1	1
Total	2907	4.8	237

Adapted with permission from Latin America Transplantation Registry Report.¹ Copyright 2016 Sociedad de Trasplantes de América Latina y el Caribe.

with the absence of organ procurement organizations, meaning that for a majority of Latin American countries, it remains difficult to develop solid liver transplant programs.

For the few countries with established programs, there are still significant barriers to access, such as low deceased donation rates, with 20.4 per million population (pmp) in Uruguay, 16.6 pmp in Brazil, and 8.5 pmp in Argentina, which are the highest numbers in the region; Nicaragua and Guatemala report just 0.2. All are inferior to the rates in developed countries, such as 46.9 in Spain and 34.0 in Portugal.⁴ As Table 2 shows, all of the countries also have the problem of low rate of conversion from multiple organ donors into effective liver transplantations. Some reasons for this include a lack of trained retrieval teams, difficulty in maintaining the viability of donors because of human resources and logistic bottlenecks related to availability of equipment and expertise, and insufficient intensive care unit beds. Countries with a large number of liver transplantations per year, such as Brazil and Argentina, with around 2000 and 400, respectively, still have problems of regional disparity because of a big geographic area. Mexico faces similar challenges. The waiting list in Argentina⁵ is more than 1200 and in Brazil⁶ 1300. Those countries have areas and states thousands of kilometers from metropolitan centers, where they do not have access to transplantation. For example, in Brazil, liver transplantation is available in just 12 of the 26 states.⁶

TABLE 2. LIVER DECEASED DONORS AND DECEASED TRANSPLANTATION BY COUNTRY IN LATIN AMERICA (2017)

Country	Deceased Donors (pmp)	Deceased Liver Transplantations (pmp)*
Argentina	13.7	8.9
Brazil	16.6	10.2
Chile	10	5.7
Colombia	8.8	
Costa Rica	6.7	2
Mexico	4.5	1.4
Trinidad and Tobago	1.5	
Dominican Republic	1.4	0.2
Guatemala	0.5	
Nicaragua	0.2	
Uruguay	20.4	7.3
Cuba	12.7	
Ecuador		2.2

*Incomplete information was reported to the International Registry in Organ Donation and Transplantation.⁴

DISCUSSION

Increasing the access to liver transplantation in Latin America will require sustained commitment from countries and their governments. We know that incremental increases in economic conditions take time, as do their impact on public health. For this reason, it is difficult to imagine a dramatic change of fortunes for the region in terms of these barriers. Nevertheless, there are two strategies that would help to ameliorate some of these challenges in the medium term.

The most effective option to increase availability of liver transplantation would be the expansion of the living donor programs. Living donors depend less on the provision of public health care infrastructure all over the country and much more on the presence of a single well-equipped hospital with a well-trained team. Turkey, for example, has greatly increased the number of living donors, whereas India has been increasing the number of living donors compared with deceased donors.⁷ At present, less than 10% of all transplantations are from living donors in Latin America, and the majority are only for pediatric recipients.⁸ The transplantation community can help to train living donor transplantation teams.

Although liver transplantation is well established in some parts of the region, there are stark geographical asymmetries in access. Some countries would require international cooperation mechanisms to open access to their populations because they lack both the financing

and expertise to establish and run centers individually. Countries could establish consortiums in strategic geographic areas: one in Central America and one in South America, where economic support can be shared between countries involved, and international foundation financing can be sought. The international transplantation community would have a strong role to play in training and support for these ventures, ensuring greater continuity and good results.

In summary, Latin America faces significant organizational, geographical, and financial challenges, but the situation could be improved by cooperation between countries and regions and with the help of the international transplantation community.

CORRESPONDENCE

Wellington Andraus, M.D., Ph.D. Digestive Organs Transplant Division, Gastroenterology Department, Sao Paulo University School of Medicine, Rua Dr. Enéas de Carvalho Aguiar, 255 - 9º Floor - Room 9113/9114, CEP 05403-900 - São Paulo, Brazil. E-mail: wellington@usp.br

REFERENCES

- 1) Sociedad de Trasplantes de América Latina y el Caribe (Stalyc). Latin America Transplantation Registry Report. Available at: <https://www.stalyc.net/registros/file/74-latin-america-transplantation-registry-report-2015-2016.html>. Accessed August 19, 2018.
- 2) Feier F, Antunes E, D'Agostino D, et al. Pediatric liver transplantation in Latin America: Where do we stand? *Pediatr Transplant* 2016;20:408-416.
- 3) The World Bank DataBank World Development Indicators - 2015. Available at: <https://www.worldbank.org>. Accessed August 19, 2018.
- 4) International Registry in Organ Donation and Transplantation. Actual Deceased Organ Donors 2017 (pmp). Available at: http://www.iro-dat.org/img/database/pdf/NEWSLETTER2018_June.pdf. Accessed August 19, 2018.
- 5) Instituto Nacional Central Único Coordinador de Ablación e Implante (INCUCAI). Reporte de pacientes inscriptos en lista de espera - 2018. Available at: <https://www.argentina.gob.ar>. Accessed August 19, 2018.
- 6) Associação Brasileira de Transplante de Órgãos. Registro Brasileiro de Transplantes Estatística de Transplantes - 2018. Available at: <https://abto.org.br>. Accessed August 19, 2018.
- 7) Global Observatory on Donation and Transplantation Liver Transplantation Rates (pmp), per countries 2015. Available at: <http://www.transplant-observatory.org/organ-donation-transplantation-activities-2015-report-2/>. Accessed August 19, 2018.
- 8) Salvalaggio PR, Neto JS, Alves JA, et al. Consensus, dilemmas, and challenges in living donor liver transplantation in Latin America. *Transplantation* 2016;100:1161-1164.