Assessment of Cytomegalovirus Status and Risk Stratification in Organ Transplant Recipients in Mexico: A Real-World Study

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Background

- Cytomegalovirus (CMV) is a common opportunistic infection in solid organ transplant (SOT) recipients, significantly contributing to morbidity and mortality. It can impact multiple organ systems and cause complications such as graft rejection and secondary infections[1]
- CMV seroprevalence varies significantly, being higher in low- and middle-income countries (75%-95%) compared to high-income regions (below 75%)[1]
- The CMV serostatus of the donor and recipient (D/R) is a key predictor of CMV infection risk post-transplant, guiding antiviral prophylaxis or preemptive treatment decisions (**Table 1**). Consensus guidelines recommend using either preemptive or prophylactic therapy for CMV prevention in all patients, regardless of risk group[2]
- Despite its widespread use, CMV risk stratification has limitations. Studies have shown up to 20% of seropositive SOT recipients, typically considered at intermediate risk, still develop CMV infection and disease post-transplant[3]
- Few studies have examined CMV incidence in SOT recipients in Mexico, reflecting a broader lack of real-world data on CMV risk status, sociodemographic factors, and management strategies across Latin America. This knowledge gap limits the ability to tailor prevention and treatment protocols to the specific needs of this population

Table 1: CMV risk stratification based on donor and recipient CMV status pre-transplant

Risk category	Donor CMV status pre-transplant	Recipient CMV status pre-transplant
High	Positive	Negative
Medium	Positive	Positive
	Negative	Positive
Low	Negative	Negative

Objectives

This study aimed to assess the CMV status and establish risk stratification for CMV disease in liver and kidney transplant recipients in Mexico, which is crucial for effective management and prevention strategies.

Methods

- A chart review study was conducted in Mexico between January 2019 and June 2021. Data were collected from 2 public hospitals and included patients aged ≥18 years who underwent liver and kidney transplants and had confirmed CMV serostatus by serologic testing prior to transplantation
- Pre-transplant CMV risk was categorized as high (D+/R−), intermediate (R+), or low (D−/R−). Post-transplant, patients were monitored by polymerase chain reaction (PCR), with CMV infection defined as a viral load ≥4000 units/mL

Results

- Out of 101 patients analyzed, 63 (62.4%) underwent liver transplant and 38 (37.6%) underwent kidney transplant. The cohort consisted of 59.4% male patients (n=60). The mean age of the cohort was 43.9 years (SD, ±14.19), with a median of 41 years (range, 31-55). Pre-transplant CMV risk stratification showed that 10.9% (n=11), 84.2% (n=85), and 4.9% (n=5) were high, intermediate, and low risk, respectively. The average post-transplant follow-up was 1,408 days, with a median of 1,460 days
- Following transplantation, 30.7% (n=31) of patients reached the viral load threshold for CMV infection, 66.3% (n=67) did not, and data were unavailable for 3% (n=3)
- For CMV prevention, 28.7% (n=29) received prophylactic valganciclovir, while 1 patient followed a preemptive strategy. The remaining patients received no intervention. Among those who developed CMV infection post-transplant, 3 (9.7%) received preemptive therapy (PET) or prophylaxis, and 28 (90.3%) received no therapy

Table 2: Pre-transplant CMV risk stratification and post-transplant CMV infection rates

Pre-transplant risk	Patients, n (%)			CMV infection post-transplant, n (%)			CMV prevention		
	Kidney	Liver	Combined	Kidney	Liver	Combined	Kidney	Liver	Combined
High	7 (6.9%)	4 (4%)	11 (10.9%)	0 (0%)	1 (1%)	1 (9.1%)	7 (100%) VGCV/PET 0 (0%) not treated	4 (100%) VGCV/PET 0 (0%) not treated	11 (100%) VGCV/PET 0 (0%) not treated
Intermediate	26 (25.7%)	59 (58.4%)	85 (84.2%)	2 (1.9%)	27 (26.7%)	29 (34.1%)	14 (53.8%) VGCV/PET 12 (46.1%) not treated	0 (0%) VGCV/PET 59 (100%) not treated	14 (16.5%) VGCV/PET 71 (83.5%) not treated
Low	5 (4.9%)	0 (0%)	5 (4.9%)	1 (1%)	0 (0%)	1 (20.0%)	5 (100%) VGCV/PET 0 (0%) not treated	0 (0%) VGCV/PET 0 (0%) not treated	5 (100%) VGCV/PET 0 (0%) not treated
Total	38 (37.6%)	63 (62.4%)	101 (100%)	3 (2.9%)	28 (27.7%)	31 (30.7%)	26 (25.7%)	4 (3.9%)	30 (29.7%) VGCV/PET 71 (70.3%) not treated

VGCV, valganciclovir.

Discussion

- This study highlights the reality of CMV infection in Mexico in liver and kidney transplant patients. We are aware that the main limitation of this study is its retrospective nature, and that detailed follow-up information was not collected. Nonetheless, the data from this study can reflect middle-income countries, where a high prevalence of CMV positivity in the general population leads to most individuals being categorized as intermediate risk
- Our results are compatible with other results from the literature, such as those before the adoption of CMV prevention, with a high incidence of CMV infection post-transplant.[5] A study conducted in pediatric SOT recipients in Mexico, described a substantial incidence of CMV infection in post-transplant patients and the limited use of CMV prophylaxis in the public health care system[4]
- In Mexico, access to medications for CMV prevention in the public health care system is limited, which poses challenges for effective CMV prevention in transplant recipients
- Efforts to improve the availability of these drugs are crucial for better management of post-transplant CMV infections and improving patient outcomes[4]

Conclusions

- This study provides valuable insights into CMV risk stratification and post-kidney and liver transplant recipients' outcomes in Mexico
- The intermediate risk category constituted the most significant proportion of patients and had the highest incidence of CMV infection after transplantation. Despite the majority being classified as intermediate risk, the low utilization of preventive strategies highlights a critical gap in post-transplant care in Mexico
- Enhancing awareness and implementing effective prophylactic measures could substantially reduce CMV-related morbidity and mortality in this population

References

1. Sagedal S, et al. *Transplantation*. 2000;70(8):1166-1174.
2. Kotton CN, et al. *Transplantation*. 2018;102(6):900-931.
3. Navarro D, et al. *Rev Med Virol*. 2019;29(1):e2017.
4. Julian Nunez J, et al. *Bol Med Hosp Infant Mex*. 2012;69(5):355-366.
5. Sagedal S, et al. *Am J Transplant*. 2002;2(9):850-856.

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