CMV immune response follow up using QuantiFERON CMV® in children during the first year after HSCT or SOT; preliminary results

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Introduction

-CMV infection→ high morbidity and mortality in hematopoietic stem cell (HSCT) and in solid organ transplant (SOT) recipients.
-Specific immune response against CMV is impaired.
-Pre-emptive (frequent need of viral load follow up) or prophylactic (viral resistence and drug toxicity anti CMV strategies are needed.
QuantiFERON-CMV® is able to detect CMV specific T lymphocytes in blood.
QuantiFERON-CMV® has been used specifically in adults SOT recipients, but there is limited information about its use in children after transplantation.

Purpouse

To describe Quantiferon-CMV levels in HSCT and SOT transplanted children, during 12 months after transplantation.
To compare Quantiferon-CMV level and HCMV viral load during 12 months follow up.

Methods

Population:
Children younger than 15 years old were enrolled after 6 weeks of HSCT and 3 months of SOT
HCMV IgG Positive Donor and/or Receptor

Laboratory:

Quantiferon-CMV was performed every month for HSCT and every two month for SOT
CMV viral load, lymphocyte count and tacrolimus and cyclosporine levels were registered
Quantiferon-CMV was performed and reported according to manufacturer instructions

Results

Sixteen patients were included (14 finished follow up), median age 9,2 years, 50% men. Eight were TOS (4 heart, 3 liver, 1 kidney), two with high risk of reactivation. Lymphocytes at 3 months were 850 and 2050 cel/ml in TPH and TOS, respectively (p=0,04). In both groups 5 patients had reactive QuantiFERON-CMV®. In SOT 4/5 had detectable CMV viral load, none of them needed antiviral therapy after reaching a reactive QuantiFERON-CMV® level. In HSCT 2/5 had CMV infection, both occurred before reaching a reactive QuantiFERON-CMV®. HSCT and SOT patients are summarized at table 1.

	SOT	HSCT
Transplant SOT, n	8	8
Cardiac	4	
Hepatic	3	
Renal	1	
HSCT, n		
Peripherial (RD/URD)*		3 (1/2)
CB**		5
Gender, female, n	4	4
Median age, years (rank)	12,8 (1-14,8)	4 (0,8-13,9)
CMV Serology		
D-/R+	0	6 (2)
D+/R-	2	
D+/R+	6	(2)
GVHD	-	6
Lymphocyte count cell/mm^3 at 3rd month, n (rank)	2050 (560-2400)	850 (400-1900)
Patients with CMV infection		
Reactivation (detectable VL), n	5	1
Clinical disease, n	0	1
Ganciclovir		
Preemptive	-	8
Prophylaxis (3 months)	8	-
Treatment	-	1
Other	2	1
Finished follow up	6	8

Table 1. *Mobilized peripheral blood, RD= related donor, URD=unrelated donor **CB=cord blood

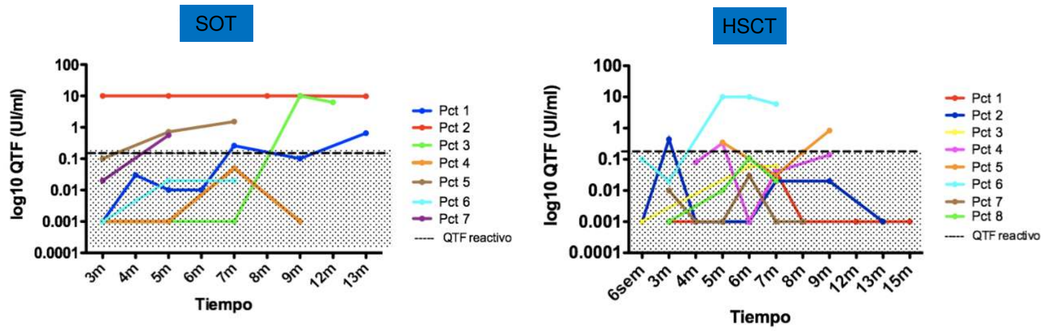

Fig 1: QuantiFERON-CMV® levels in patients with TOS and TPH

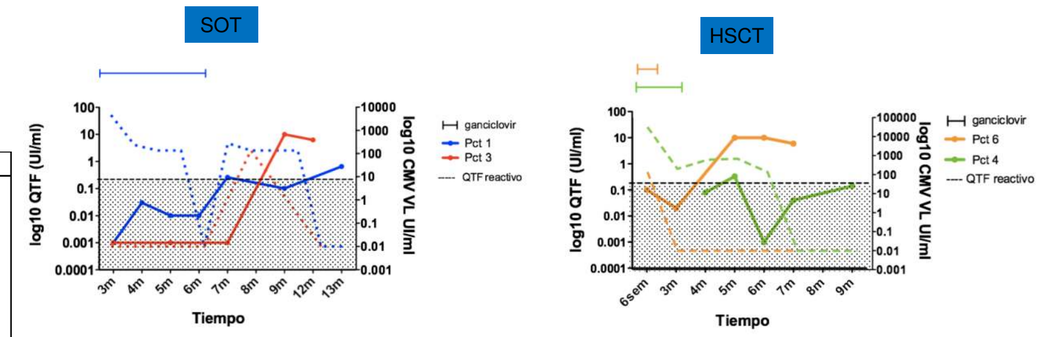

Fig.2: QuantiFERON-CMV® levels and HCMV viral loads in 2/4 patients TOS and 2/2 patients TPH

Conclusions

-No HCMV reactivations were observed when QuantiFERON®-CMV was reactive (presence of specific T cell CMV immunity).

-Specific and functional lymphocytes seem to depend on donor and recipient CMV previous infection and degree of immunosuppressive therapy.

-Patients with CMV detectable viral load and a reactive QuantiFERON-CMV® did not required antiviral therapy.

-QuantiFERON-CMV® can be useful after the suspension of antiviral prophylaxis in SOT.

-In HSCT, CMV infection was less frequent, so it is difficult to make recommendations, it could be useful in patients that already have had a positive CMV viral load.

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