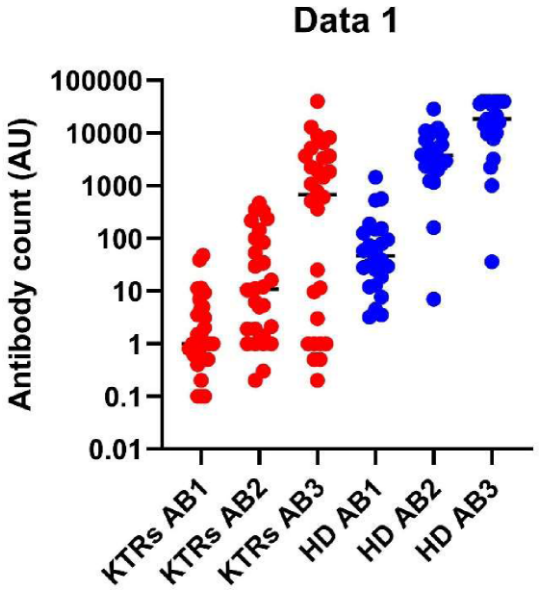
arm, respectively (not significant). Medical time dedicated to handling daily lab results was decreased by a factor 3 for KTR using Ap'Telecare®.
CONCLUSION: This preliminary report of Ap'Tx suggest that a partial and reasonable remote follow-up of selected KTR is both feasible and safe. Determining the nature of factors associated with a wider implementation of Ap'Telecare® is important.

MO990 HUMORAL AND CELLULAR IMMUNE RESPONSES AFTER BOOSTER DOSE WITH BNT162B2 VACCINE IN HEMODIALYSIS PATIENTS AND KIDNEY TRANSPLANT RECIPIENTS

Anila Duni[1,2], Ioannis Mallioras[1], Georgios Markopoulos[3], Haralambos Pappas[1,2], Efthymios Pappas[4], Vasileios Koutlas[2], Eirini Tzalavra[2], Gerasimos Baxevanos[3,5], Silvia Priska[6], Georgios Katagis[7], Konstantina Gartzonika[7], George Vartholomatos[3], Mixalis Mitsis[2] and Evangelia Ntounousi[1,2,6]

[1]University Hospital of Ioannina, Department of Nephrology, Ioannina, Greece, [2]University Hospital of Ioannina, Department of Nephrology and Kidney Tranplant Unit, Ioannina, Greece, [3]University Hospital of Ioannina, Laboratory of Hematology—Unit of Molecular Biology, Ioannina, Greece, [4]General Hospital of Filiates, Renal Unit, Filiates, Greece, [5]Hatzikosta General Hospital of Ioannina, Department of Internal Medicine, Greece, [6]University of Ioannina, School of Health Sciences, Department of Nephrology, Ioannina, Greece, and [7]University of Ioannina, School of Health Sciences, Microbiology Laboratory, Ioannina, Greece

BACKGROUND AND AIMS: Mortality due to SARS-COV-2 infection in hemodialysis (HD) patients and kidney transplant recipients(KTRs) is high. Despite increased rates of administration of two doses of mRNA vaccines among these vulnerable populations, the adequacy of the respective generated immune responses is reported lower than general population, especially in KTRs. A third booster dose has been officially recommended in these immunocompromised patients while the humoral and cellular immune responses to SARS-COV-2 vaccination remains to be elucidated in HD patients and KTRs. The aim of our study was to investigate the antibody (Ab) response status together with vaccine-induced alterations in circulating lymphocytes subsets, following the administration of three doses of the BNT162b2 vaccine in a cohort of maintenance HD patients and KTRs.
METHOD: The initial cohort of this prospective study (ClinicalTrials.gov, NCT04932876) included 34 HD patients and 54 KTRs who received two doses of the BNT162b2 (Pfizer–BioNTech). Of this cohort, 24 HD patients and 30 KTRs, who remained free of SARS-CoV2 infection and receive a third dose 6 months after the second dose, were finally analyzed. Lymphocyte subpopulations, including B cells, CD4+and CD8+T cells as well as naïve and memory T lymphocytes subpopulations among others, were analyzed by flow cytometry at four time points, before vaccination (T0), before the second dose (T1), 2 weeks after the second dose (T2) and 2–3 weeks after the third dose (T3). The anti-SARS-CoV2 antibody (Ab) response was assessed by using the ARCHITECT IgG II Quant test (Abbott). Titers >50 arbitrary units (AU)/mL were considered positive for seroconversion at T1 and at T2 and T3.
RESULTS: Of the initial cohort 31 HD patients (91.8%) and 16 KTRs (29.6%) became seropositive at T2. Of the final cohort (24 HD and 30 KTRs), almost all HD patients (23, 96%) became seropositive since T2 and this finding remained at T3 (Figure 1). In KTRs the percentage of responders was doubled between T2 and T3, T2 9 KTRs (30%) versus T3 18 KTRs (60%) (Figure 1). KTRs who developed Ab at T1 "respond" better to the third dose, maximizing the levels of Ab. HD patients who became seropositive at T1 displayed higher CD19+B lymphocytes compared with their seronegative HD counterparts. In HD patients, a positive correlation was established between CD19+B cells counts and Ab titers at all time-points ($P < 0.001$). In KTRs, Ab at T1 showed an inverse correlation with T+B+NK at T1 ($P = 0.006$). T2-Ab showed inverse correlation with CD45RA+CD45RO at T0 ($P = 0.01$) and with CD3+at T3 ($P = 0.02$). T3-Ab showed positive correlation with CD3+CD16+56+at T2 ($P = 0.003$) and with CD3-CD16+56+at T3 ($P = 0.01$). CD19+at T3 correlated positively with Ab at T1 and T3 ($P = 0.003$ and $P = 0.03$, respectively).
CONCLUSION: Our study confirms the improved immunogenicity after the third dose of BNT162b2 vaccine in KTRs. The positive correlation between CD19+B cells and Ab in both groups of patients, more stable and constant in HD patients in comparison with KTR, possibly reflects successful humoral immunity. However, a big proportion of kidney patients remain at high risk for COVID-19 infection considering the new more transmissible variants such as the Omicron variant.



MO991 COVID-19 INFECTION AFTER KIDNEY TRANSPLANTATION IN SPAIN: COMPARABLE IMPACT THROUGHOUT SIX EPIDEMIC WAVES

Laura Llinàs-Mallol[1,2], Carla Burballa[1,2], Dolores Redondo Pachon[1,2], Eulàlia Solà[1,2], Carlos Arias-Cabrales[1,2], Anna Buxeda[1,2], Aida Martinez Saez[1], Anna Bach[1], Julio Pascual[1,2,3], María José Pérez-Saéz[1,2] and Marta Crespo[1,2]

[1]Hospital del Mar, Nephrology, Barcelona, Spain, [2]Hospital del Mar Medical Research Institute, Nephrology, Barcelona, Spain, and [3]Hospital Universitario 12 de Octubre, Nephrology, Madrid, Spain

BACKGROUND AND AIMS: The successive COVID-19 epidemic waves have significantly influenced kidney transplantation (KT) programs. Contact protection together with vaccination are the principal protective tools for KT recipients. We reviewed the impact of COVID-19 infection in KT recipients throughout the different epidemic waves.
METHOD: Of 900 active KT recipients in our program, 160 (17.8%) have suffered COVID-19 infection during the six epidemic waves: first (March–August 2020), second (September–December2020), third (January–March 2021), fourth (April–May 2021), fifth (June–September 2021) and sixth (October–December 2021, preliminary data). We compared the clinical evolution and the impact of vaccination.
RESULTS: Infected KT recipients were younger in the third and fourth waves ($P < 0.001$). We observed a higher percentage of pneumonia and hospital admission in the first and fifth waves ($P = 0.045$, $P = 0.016$) (Table 1), without differences in ICU admission, and with the disappearance of asymptomatic cases after the third wave. The highest mortality was observed in KT recipients >65 years old infected within the first 6 months after KT ($P = 0.006$) and overall mortality was higher in the first wave ($P = 0.033$). Mortality in hospitalized KT recipients and those admitted in the ICU were similar along the 5 waves, without clear impact of vaccination ($P = 0.251$). On the 5 January 2022, we have already accumulated an incidence of COVID in KT of 3.1% (sixth wave, 77% with booster vaccination), similar to the first wave (3.8%), with 12.5% mortality, similar to second, third and fifth waves, in patients with outcome (53.3%).
CONCLUSION: The incidence of COVID-19 in KT recipients has been high in all the waves of the pandemic in Spain. Global mortality has diminished after the first wave, and the time until outcome has increased. The highest mortality occurs in the subgroup of old KT recipients early after KT. Vaccination has not significantly reduced the mortality in KT with Covid who require hospital or ICU admission.

Table 1.

	1st wave, n= 32	2nd wave, n=45	3rd wave, n=23	4th wave, n=4	5th wave, n=26	p-value	6th wave, n=30 (until 5th January 2022)
Infected KT and incidence (n, %)	32 (32/842, 3.8%)	45 (45/903, 4.9%)	23 (23/913, 2.5%)	4 (4/941, 0.4%)	26 (26/967, 2.6%)		30 (30/969, 3.1%)
COVID-19 vaccination						**<0.001**	
Complete	0 (0%)	0 (0%)	0 (0%)	4 (100%)	24 (92.3%)		29 (96.7%)
- *Pfizer*				*- 0 (0%)*	*- 5 (20.8%)*		*- 6 (20.7%)*
- *Moderna*				*- 4 (100%)*	*- 19 (79.2%)*		*- 22 (75.9%)*
- *AstraZeneca*				*- 0 (0%)*	*- 0 (0%)*		*- 1 (3.4%)*
Partial	0 (0%)	0 (0%)	3 (13.0%)	0 (0%)	1 (3.8%)		0 (0%)
Recipient gender (female) (n, %)	12 (37.5%)	15 (33.3%)	3 (13.0%)	1 (25.0%)	11 (42.3%)	0.190	14 (46.7%)
Recipient age (years) [mean (SD)]	67.4 (10.1)	61.2 (11.7)	54.3 (15.1)	49.8 (10.2)	62.7 (12.1)	**<0.001**	58.9 (14.8)
Time after KT (months) [median (IQR)]	46.5 [12.7-116.4]	75.6 [27.1-111.4]	86.6 [38.2-118.1]	29.7 [17.4-50.0]	55.2 [28.5-112.3]	0.314	41.3 [16.3-133.9]
Asymptomatic infection (n, %)	2 (6.3%)	7 (15.6%)	4 (17.4%)	0 (0%)	0 (0%)	0.135	0 (0%)
Fever (n, %)	24 (77.4%)	27 (60.0%)	16 (69.6%)	2 (50.0%)	18 (69.2%)	0.513	
Respiratory symptoms (n, %)	22 (73.3%)	26 (59.1%)	11 (47.8%)	3 (75.0%)	20 (76.9%)	0.176	
Gastrointestinal symptoms (n, %)	14 (45.2%)	12 (27.3%)	7 (30.4%)	1 (25.0%)	11 (42.3%)	0.474	
Pneumonia (n, %)	24 (80.0%)	24 (53.3%)	12 (52.2%)	2 (50.0%)	20 (76.9%)	**0.045**	
Hospital admission (n, %)	28 (87.5%)	25 (55.6%)	14 (60.9%)	3 (75.0%)	21 (80.8%)	**0.016**	
ICU admission (n, %)	7 (25.9%)	9 (37.5%)	2 (14.3%)	1 (33.3%)	9 (42.9%)	0.371	
Time of admission [median (IQR)]	11 [5-19]	18 [14-26]	11 [7-21]	11 [7-49]	16 [8-38]	0.092	
Endotracheal intubation (n, %)	9 (33.3%)	5 (20.8%)	2 (14.3%)	1 (33.3%)	8 (38.1%)	0.450	
Treatment: Tocilizumab (n, %)	7 (22.6%)	3 (6.7%)	2 (8.7%)	0 (0%)	3 (11.5%)	0.320	
Exitus (n, %)	12 (37.5%)	5 (11.1%)	2 (8.7%)	0 (0%)	4 (16.0%)	**0.033**	
Exitus / admitted patients (n, %)	12 (42.9%)	5 (20.0%)	2 (14.3%)	0 (0%)	4 (20.0%)	0.180	
Exitus / ICU admitted patients (n, %)	3 (42.9%)	4 (44.4%)	1 (50.0%)	0 (0%)	3 (37.5%)	1.000	

Table 1. Basal and epidemiologic characteristics of KT recipients with COVID-19 infection according to the epidemic wave of infection. One patient Corresponding to the 5th wave was pending of outcome at the closing of the analysis. Complete vaccination = 2 doses (2º dose >14 days before infection). Partial vaccination = 1 dose or 2 doses if 2º dose <14 days before infection.

MO992 IS IT SAFE TO RECEIVE KIDNEYS FROM DECEASED KIDNEY DONORS WHO TESTED POSITIVE FOR COVID-19 INFECTION?

Hatem Kaies Ibrahim Elsayed Ali[1], Mahmoud Mohamed[2], David Briggs[3] and Nithya Krishnan[1]

[1]university hospitals of Coventry and Warwickshire, Renal, UK, [2]north mississippi medicl center, USA, and [3]National Health service blood and transfusion, USA

BACKGROUND AND AIMS: Our modern world is facing extraordinary circumstances while passing through a serious pandemic caused by the novel coronavirus (COVID-19) which may lead to multi-organ system failure and death. COVID-19 deaths may provide a potential source for kidneys available for transplantation. In our study, we are discussing the safety of receiving kidneys from donors who tested positive for the novel coronavirus.
METHOD: All renal transplant recipients registered in UNOS database who had their transplants between 1 March 2020 and 1 June 2021 were retrospectively reviewed. Patients who received kidney transplants from a deceased donor with positive PCR of COVID-19 test were included in our study. Patients were followed up till 1 July 2021. Data about recipient factors (age, sex, ethnicity, diabetes and date of renal transplant), transplant factors (type of induction therapy, maintenance immunosuppressive therapy, delayed graft functions, early post-operative rejection episodes, HLA mismatch, PRA level and cold ischemia time) and donor factors (age, sex, ethnicity, diabetes, hypertension, date of COVID-19 test and type of COVID-19 test) were collected. Outcome measured were post-transplant hospitalisation, acute rejection, delayed graft function, patient, and graft survival till the end of the follow-up.
RESULTS: Eighty-six transplant patients received kidneys from deceased donors who tested positive for COVID-19 infection using PCR test. Sixty patients received kidneys from deceased patients who tested positive for COVID-19 within 30 days pre-transplant. Twenty-six patients received kidneys from deceased patients who tested positive for COVID-19 between 30 and 90 days pre-transplant. Number of post-transplant hospitalisation and acute rejection episodes were nil. 19.76% of the patients had delayed graft functions. Graft loss occurred in one patient due to graft vein thrombosis. Patient survival was 100%.
CONCLUSION: Receiving kidneys from deceased donors who tested positive for COVID-19 infection seems safe and does not affect hospitalisation, acute rejection rates, graft or patient survival. Longer follow-up is needed to confirm our results.

MO993 INCIDENCE OF PTLD AND ITS RELATIONSHIP WITH CMV-SEROSTATUS POSITIVITY AMONG CHILDHOOD AND ADULTHOOD POPULATION: A REGISTRY DATA STUDY

Hatem Kaies Ibrahim Elsayed Ali[1], Mahmoud Mohamed[2], David Briggs[3] and Nithya Krishnan[1]

[1]University Hospitals of Coventry and Warwickshire, UK, [2]North Mississippi Medicl Center, USA, and [3]National Health Service Blood and Transfusion, UK

BACKGROUND AND AIMS: It is unknown how the epidemiology of post-transplant lymphoproliferative disease (PTLD) and its relationship with CMV infection differ between adult and pediatric kidney transplant recipients. In addition, with current advancements in immunosuppressive therapy, the incidence of PTLD has changed dramatically. The aim of our study is to elucidate the relationship between PTLD and CMV infection. Moerover, to assess the incidence of PTLD among Adult and pediatric renal transplant patients in the current era.
METHOD: All renal transplant patients registered in the Organ Procurement and Transplantation Network between 2005 and 2019 were retrospectively reviewed. Patient were followed up till December 2020. Patients who had multiple organ transplant or those with previous renal transplants were excluded from the study. Data about recipient factors (age, sex ethnicity, diabetes, CMV serostatus, and EBV serostatus), donor factors (living or deceased), transplant factors (PRA, Cold ischemia time, HLA mismatches, induction and immunosuppressive therapy) were reviewed. Incidence rate of PTLD at one year and five years post-transplant were calculated among the Adult and Pediatric population. Univariate and Multivariate cox-hazard regression models were performed to assess the relationship between CMV serostatus and occurrence of PTLD.
RESULTS: About 10 947 pediatric renal transplant patients were included. About 315 pediatric patients developed PTLD during the follow-up time (2.88%). About 50.55% of PTLD occurred within the first-year post-transplant. 60% occurred within two-year post-transplant, while 80.63% of them occurred within five years post-transplant. CMV recipient infection was not associated with PTLD occurrence in the pediatric population (HR = 0.88, Pvalue = 0.81, 95% confidence interval ranged between 0.66 and 1.18). Proportional hazard assumption was not violated with P = 0.55. Among the adult population, 1990/277 955 developed PTLD (0.77%). About 25.77% of PTLD among the adult population occurred within the first-year post-transplant. About 39.39% of PTLD in the adult occurred within two-year post-transplant. About 66.55%