

Renal Association Elective Report – Joey Junarta

In July 2017, I embarked on my year-long renal research elective under the tutelage of Dr. Debasish Banerjee at St. George's, University of London. I functioned as a clinical research assistant for the Cardiology Clinical Academic Group and the Renal and Transplantation Unit at St. George's. All the projects I conducted related to Cardio-Renal syndrome. My main project was to continue a prospective cohort study investigating the progression of cardiovascular abnormalities in chronic kidney disease (CKD) patients. Simultaneously, I assisted in the execution of three audits evaluating methods to improve outcomes in CKD patients with cardiac comorbidities. Towards the end of my elective, I had the pleasure of writing three manuscripts destined for online journal submission as well as a manuscript for a book chapter.

The short study title of my main project was the 'Progression of Arterial and Cardiac disease in Kidney patients (PACK)'. As one of the main researchers, I had to perform various clinical cardiovascular function and structure research techniques to obtain data. This encompassed measuring the following: flow-mediated dilation, pulse wave velocity, aortic augmentation index, carotid artery intima-media thickness, cardiac autonomic modulation and repolarisation indices, ankle-brachial index, and blood biomarkers. I found it extremely enjoyable to learn how to conduct these techniques and eventually became highly competent in performing them. As I began to encounter more study participants, I quickly noticed how unique the practitioner-patient relationship is in the medical research setting. I spent 2.5-3 hours per study participant, which allowed ample time to get to know patients and find out how their chronic disease affected their lives. Many patients expressed the detrimental effect it can have on their psychosocial health. Several opportunities arose where I suggested to my supervisor that we refer certain patients for treatment and/or counselling. Upon follow-up, I was very gratifying to find out that they found the referrals useful. Through the development of a unique practitioner-patient dynamic as well as immersing myself in cardiovascular and renal medicine, specialties for which I have a passion for, this project kick-started my love for clinical research.

The three audits I participated in analysed the difficulties in managing CKD patients with heart failure (HF) attending HF clinics, benefits of a cardiology-renal multi-disciplinary approach in managing high cardiac risk patients on kidney transplantation waitlists, and the role of a novel kidney failure-heart failure clinic. Conducting these audits allowed me to strategise with leading nephrologists and cardiologists to improve current management protocols and develop novel ones. I was predominantly tasked with collecting, analysing, and interpreting data in preparation for publication and presentation. I felt that critically reviewing current guidelines and aiming to better them allowed me to question and engage in my clinical judgment skills. Here, I started to realise how important research can be in directly improving one's clinical skills in managing patients.

Indeed, one of the reviews I wrote investigated the management of acute admissions of HF patients with kidney disease. Acute admissions of HF with CKD are common and are associated with increased morbidity and mortality. In writing the manuscript, I learnt that hyperkalaemia and acute on chronic renal impairment are important challenges in the

management of these cases. Thus, essential learning points included the importance of cautious introduction of high-dose diuretic therapy, followed by the re-introduction of renin-angiotensin-aldosterone (RAAS) inhibitors. This improves length of stay, quality of life, and prognosis.

The PACK study explored the ubiquitous cardiovascular abnormalities seen in CKD patients. I decided to build on what I learnt in conducting that study by writing two manuscripts reviewing the impact of vitamin D supplementation in improving abnormal cardiovascular structure and function in CKD patients. Vitamin D deficiency is highly prevalent in CKD and the presence of it has been associated with increased cardiovascular mortality in both the general population and in CKD. Meta-analyses of observational studies have suggested that vitamin D supplementation in CKD improves cardiovascular mortality. However, randomised controlled trials (RCTs) examining the impact of vitamin D supplementation in improving surrogate markers of cardiovascular structure and function remain inconclusive. Yet, the interventional dose has been kept low in many of these RCTs and there are no completed RCTs that are appropriately designed to evaluate the impact of vitamin D supplementation on hard end-points in CKD. Currently, the utility of vitamin D supplementation in improving cardiovascular health in CKD remains unsettled and more research is needed to come to a definitive conclusion. The SIMPLIFIED trial (ISRCTN15087616) is the only ongoing RCT evaluating the impact of vitamin D supplementation on hard end-points. It is projected to finish in 2025 and will hopefully provide an improved understanding of the role of vitamin D supplementation in improving all-cause and cardiovascular mortality in CKD patients. Ultimately, producing these manuscripts were critical in developing my writing skills as a physician-scientist. I had to digest and understand current medical information from various sources and critique them. It allowed me to be adept at presenting oppositional views and to be able to argue for and against varying opinions.

I had an unforgettable year working as a clinical research assistant to Dr. Debasish Banerjee. The practical, clinical, and critical thinking skills I developed this year was priceless. I have undoubtedly developed a passion for clinical research because of it.