



RACP Foundation Research Awards

FINAL REPORT

Project / Program Title	Improving Fracture Prediction and Clinical Care for Patients with Chronic Kidney Disease and Kidney Transplantation	
Name	Dr Jasna Aleksova	
Award Received	2019 RACP/ESA Research Establishment Fellowship	
Report Date	May 2021	
Chief Investigator / Supervisor	Frances Milat	
Administering Institution	Monash University/Hudson Institute	
Funding Period	Start Date:	May 2020
	Finish Date:	May 2021

PROJECT SUMMARY

Patients with CKD have exceptionally high fracture rates compared with the general population, with a significantly increased morbidity and mortality. However, our ability to predict patients who will fracture using non-invasive techniques is limited, and there is an overwhelming unmet clinical need to optimise our diagnostic and clinical management of bone health in these patients.

This study examined newer imaging modalities that may improve fracture prediction in these patients. Specifically, this research looks at the trabecular bone score (TBS) and advanced hip analysis (AHA), both derived from DXA images, to assess their utility in assessing underlying bone health in patients with CKD.

PROJECT AIMS / OBJECTIVES

1. To investigate AHA parameters cross-sectionally in patients with CKD compared to the normal population.
2. To prospectively assess changes in AHA parameters one year after transplantation
3. To assess if AHA parameters are predictive of fractures in CKD patients, and if change in AHA parameters are predicted by baseline factors or by medical interventions.
4. To assess the AHA parameters and Trabecular bone score in patients undergoing simultaneous pancreas- and kidney (SPK) transplantation who also have concomitant Type 1 diabetes mellitus (T1DM).

SIGNIFICANCE AND OUTCOMES

Compared to age and gender matched controls, patients with end stage kidney disease had markedly abnormal cortical parameters as analysed by the AHA. The deteriorated AHA measures were also predictive of prevalent fractures in these patients.

In patients with concomitant T1DM and end stage kidney disease, we found they had trabecular bone scores and AHA parameters that were more deteriorated than those with ESKD alone. This suggests T1DM produces additive adverse effects on bone health.

The prospective studies that will assess the changes in TBS and AHA post transplantation are underway and will elucidate the utility of this for predicting incident fractures.

By improving diagnostic strategies and recognizing potential therapeutic targets, these studies ultimately aim to reduce fractures and their associated morbidity and mortality.

If AHA parameters serve as independent risk factors for fracture in the prospective studies, they are likely to be included in guidelines that assess fracture risk and define treatment thresholds for patients with CKD and kidney transplantation.

PUBLICATIONS / PRESENTATIONS

Aleksova J, Milat F, Kotowicz MA, Pasco JA, Schultz C, Wong P, Ebeling PR, Elder GJ. [Patients with end-stage kidney disease have markedly abnormal cortical hip parameters by dual-energy X-ray absorptiometry](#). Nephrol Dial Transplant. 2019 Nov 7. pii: gfz195. doi: 10.1093/ndt/gfz195.

Aleksova J, Ebeling PR, Milat F, Elder GJ. DXA-derived Trabecular Bone Score and Advanced Hip Analysis in Patients with Type 1 Diabetes undergoing Simultaneous Pancreas and Kidney Transplantation.

- *Presented at the Australia diabetes annual conference and Australia and New Zealand Bone and Mineral research Society annual conference, 2020*
- *Currently in Peer review with JBMR*

ACKNOWLEDGEMENTS

Aleksova J, Ebeling PR, Milat F, Elder GJ. [DXA-derived Trabecular Bone Score and Advanced Hip Analysis in Patients with Type 1 Diabetes undergoing Simultaneous Pancreas and Kidney Transplantation](#).

The longitudinal research data of AHA in CKD and SPK patients will be also acknowledge the RACP/ESA grant once published.