The burden of venepuncture for kidney transplant patients and interest in possible solutions

Carla E. Scuderi1,2, Dr Suzanne L. Parker3, Dr George John4, Dr Brett McWhinney4, Dr Jacobus Ungerer4,8, A/Prof Andrew Mallett1,8,9, Prof Jason A. Roberts3,5,6,7,10, A/Prof Helen Healy2,8 A/Prof Christine E. Staatz2

Background: Kidney transplant patients require repeated blood sampling to monitor immunosuppressant drug concentrations to ensure they are within a narrow therapeutic target range and to assess kidney function. Point-of-care testing involving finger-prick based blood-draw, using dried blood spot (DBS) or volumetric absorptive microsampler (VAMS, Figure 1), may offer advantages over needle based blood-draw (venepuncture), including ease-of-sampling and the potential for patients to collect samples themselves in their own home.

Aim: The aim of this study was to quantify the burden to the patient associated with venepuncture and to explore patient willingness to use finger-prick based microsampling.

Methods:
- Thirty-nine (39) adult kidney transplant out-patients who attended the Kidney Health Service at the Royal Brisbane & Women’s Hospital for routine monitoring underwent both venepuncture and finger-prick based blood-draws.
- Participants completed an 11 item qualitative survey to describe their understanding, tolerability, preferences and the associated-burden of blood sampling.
- A Wilcoxon Signed-Rank test was used to compare reported pain/discomfort between finger-prick testing and venipuncture.

Results:
- 44% (n = 17) of participants reported that provision of a venepuncture sample took ≥ 1 hour.
- 33% (n = 13) of participants reported experiencing anxiety around having blood tests.
- Finger-prick testing was considered less painful compared to venepuncture; mean Likert score of 1.46 compared to 1.77, respectively (P = 0.016).
- 85% (n = 33) of participants preferred sample collection via finger-prick (see Figure 2).
- 97% (n = 37) of participants indicated interest in self-sampling by finger-prick at home.

Conclusion: This study observed a patient preference for microsampling methods with flexibility for point-of-care blood sampling as an alternative to venepuncture in adult kidney transplant recipients.

Author Affiliations
1. Kidney Health Service, Metro North Hospital and Health Service, Brisbane, QLD, 4029, Australia
2. School of Pharmacy, University of Queensland, Brisbane, QLD, 4102, Australia
3. UQ Centre for Clinical Research, Faculty of Medicine, The University of Queensland, Brisbane, Australia
4. Pathology Queensland, Brisbane, QLD, 4029, Australia
5. Department of Intensive Care Medicine, Royal Brisbane & Women’s Hospital, Brisbane, Australia
6. Centre for Translational Anti-Infective Pharmacodynamics, School of Pharmacy, The University of Queensland, Brisbane, Australia
7. Division of Anaesthesiology Critical Care Emergency and Pain Medicine, Nîmes University Hospital, University of Montpellier, Nîmes France
8. Faculty of Medicine, The University of Queensland

Figure 1. Dried blood spot card (DBS) and volumetric absorptive microsampler (VAMS)

Figure 2. Patient preference of blood sampling method