Abstract ID#: 131865
CODE: CO104

ISPOR Europe 2023
12-15 November | Copenhagen, Denmark

'Identification and Selection of Biomarkers in Patient-Centric Treatment Management of Rare/Orphan Kidney Diseases: An Ongoing Research Project Aiming to Develop Personalized Treatment Algorithms'

https://www.ispor.org/heor-resources/presentations-database/presentation/euro2023-3786/131865

Domenico Merante, Global Clinical Development Expert, Zug, 6300 - Switzerland
Henrik Schou, Global Medical Affairs and Real-World Evidence Expert, Zug, 6300 - Switzerland

Background and Objectives:

There is a large unmet medical need for personalised treatment algorithms in kidney rare diseases to support patients in achieving better outcomes such as quality of life and disease control and progression of complications. A patient-centric approach is key for managing rare/orphan kidney diseases. In this disease area, the identification and use of sensitive biomarkers, beyond initial diagnoses, is crucial for improving patient care. [1,2]

This research project aims to identify suitable biomarkers for potential development of personalized treatment algorithms and wearables. [3,4]

By identifying and selecting biomarkers that can sensitively and rapidly detect meaningful changes of laboratory signs and patient-most burdensome clinical symptoms, the management of those already treated rare/orphan kidney diseases could be significantly enhanced. The approach could lead to disease-management improvement and patient outcomes. [5-7]

Methods:

Clinical trials focusing on rare/orphan kidney diseases from 2018 onwards were screened and jointly reviewed with Climedo Health GmbH, Munich, Germany, resulting in over 200 identified potential biomarkers. To prioritize these biomarkers for feasibility assessment, a two-fold approach was employed. Firstly, the frequency of biomarker usage across trials was analyzed to identify commonly employed biomarkers. Secondly, post-market clinical trials were selected to assess biomarkers used in trials addressing available therapies. The use of an existing patient-centric, reported outcome questionnaire was assessed for implementation and adaptation in this disease area.

Results:

Through leveraging public domain data, Google, and ChatGPT, complementing the search from Dr.Evidence, PubMed, Medline, Embase, Cochrane, ClinicalTrials.gov, nine biomarkers were prioritized to be considered for further analysis ("shortlist"). The preliminary shortlist (refer to following Table) is a combination of biomarkers search through data from their highest usage in clinical trials and from those used across prioritized indications.

Table below shows a preliminary shortlist of identified biomarkers in rare/orphan kidney diseases

SHORTLIST 1 Highest usage in clinical trials	===> SHORTLIST 2 Used accross prioritized indications	===> SHORTLIST Combined from (1) and (2)
Albumin	Albumin	Albumin
Albumin/Creatinine Ratio	Albumin/Creatinine Ratio	Albumin/Creatinine Ratio
Anti Drug Antibody	Anti Drug Antibody	Anti Drug Antibody
Complement C3	CD19 molecule	Complement C3
Creatinine	Complement C5	Creatinine
	Creatinine	CD19 molecule
	Cystatin C	Complement C5
	SC5b-9 protein complex	Cystatin C
		SC5b-9 protein complex

Conclusions:

Many rare/orphan kidney diseases are today still untreated or are very difficult to treat with the existing available treatments. In this area the development and use of personalized treatment algorithms is still lacking, whereas this is common in other diseases, such as diabetes mellitus showing the benefits of 'patient empowerment' and disease management.

This research project intends to explore if a path is feasible through identified/selected biomarkers, whilst few more are ongoingly assessed for clinical use, to generate personalized treatment algorithms and wearables. The outcome would be highly beneficial for those people suffering from poorly treated rare/orphan kidney diseases.

Next steps of this research project will be to assess whether these biomarkers are sensitive to recent changes in the body/kidney and evaluate further criteria for feasibility assessment (resulting in the "final list"). In addition, a parallel work is ongoing to develop a patient-centric, reported outcome questionnaire to easily capture most burdensome and common ground clinical symptoms reported by people suffering from rare/orphan kidney diseases.

Main references:

1. Lousa I. et al. New potential biomarkers for chronic kidney disease management/a review of the literature. *International Journal of Molecular Sciences*. January 2021. 22 (1), 43. https://www.mdpi.com/1422-0067/22/1/43. Accessed on 3 Nov. 2023
2. Zhang WR. et al. Biomarkers of Acute and Chronic Kidney Disease. *Annual Review of Physiology* 2019; February 10: 81:309-333
3. Gaweda AE. et al. 'Artificial intelligence guided precision treatment of chronic kidney disease–mineral bone disorder'. *CPT: Pharmacometrics & Systems Pharmacol.* 2022; 11:1305-1315
4. M. Stauss et al. 'Wearables in Nephrology: Fanciful Gadgetry or Prêt-à-Porter?' *Sensors* 2023, 23, 1361. https://doi.org/10.3390/s23031361. Accessed on 3 November 2023.
5. D. Merante and H. Schou. 'The Urgency of Generating Real World Evidence Data to Bridge an Existing Gap between Randomized Clinical Trials and Clinical Practice in Rare and Orphan Kidney Diseases: An Ongoing Research from Main Available Platforms'. Poster at ISPOR 2023, Boston, MA/US. Abs ID#: 123573. PCR84. *Value in Health*, Vol. 26, Issue 6, S327
6. D. Merante & H. Schou. 'Gaps, challenges and innovative technology in rare/orphan kidney diseases: an area characterized by a large unmet medical need. Are personalized treatment-algorithms feasible?' *Medhealth Outlook*: https://medhealthoutlook.com/cro/. 20 July 2023. Accessed on 3 November 2023.
7. H.Schou and D. Merante. 'Rare Disease Biomarkers and Companion Diagnostics'. *FirstWord Pharma*. 2023. Available at https://www.firstwordreports.com/