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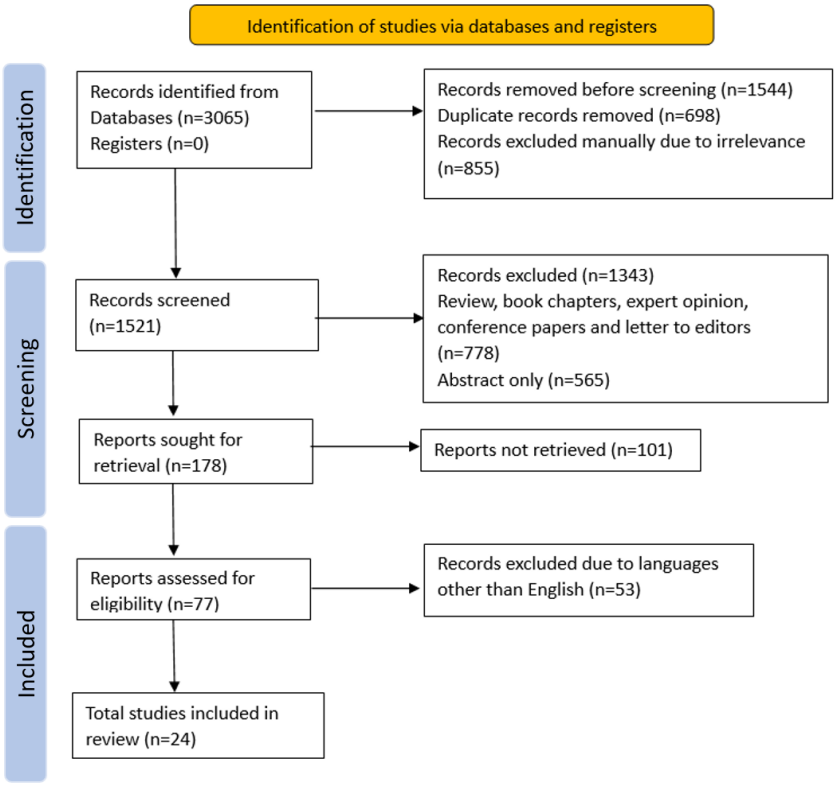
Analyzing the Role of Urine-to-Plasma Urea Ratio as Predictive Biomarker in Autosomal Dominant Polycystic Kidney Disease Progression: A Systematic Review

Najma Nusaibah[1], Rifah Rosyidah[2], Heri Dwi Purnomo[3]
[1]Department of Internal Medicine-Nephrology, Dr. Moewardi Hospital, Central Java, Indonesia
[2]Department of Pediatric , Dr. Moewardi Hospital, Central Java, Indonesia
[3]Department of Anesthesiologist, Dr. Moewardi Hospital, Central Java, Indonesia

Objectives : In patients with autosomal dominant polycystic kidney disease (ADPKD), it can be difficult to predict how the condition will evolve, particularly in the early stages when renal function is still unaffected. From an early age, the maximum urine-concentrating capacity decreases due to the continuous growth of cysts. We therefore hypothesized that the urine-to-plasma (U/P) urea ratio, as a reflection of the urine-concentrating capacity, can be used as a marker to predict ADPKD progression
Methods : This systematic review is accordance with the PRISMA guidelines. Following recognized criteria for performing systematic reviews, a thorough literature analysis was carried out using the Medline and Scopus databases to identify published articles examining the potential U/P urea ratio for predicting the course of ADPKD. This literature is restricted to full-text English-language publications obtained up to November 1, 2023
Results : The literature search generated 3065 articles, of which 24 met the study criteria and were included in the review (n=1026, age range=18-60 years, eGFR range=30-60ml/min per 1.73m^2). Recent studies suggest defective concentrating capacity in ADPKD is due to cystic destruction of medullary architecture, with U/P urea ratio as a measure. Most studies using data from water deprivation tests in patients with ADPKD, confirmed that baseline U/P urea significantly correlates with disease progression in ADPKD. Fewer studies, investigating the any potential serum and urine biomarkers such as U/P urea ratio, copeptin, angiotensinogen, monocyte chemoattractant protein-1, kidney injury molecule-1 and many others, has shown that a combine of these biomarker predicted accelerated disease progression better than each of the predictors individually
Conclusions : These results suggest that employing urine-to-plasma urea ratios is a reliable method for detecting ADPKD progression and identifying patients with a more unfavorable prognosis. Utilizing a combination of biomarkers might offer enhanced accuracy in predicting ADPKD progression compared to relying on a single biomarker

PRISMA 2020.png


Identification of studies via databases and registers
Identification
Records identified from Databases (n=3065) Registers (n=0)
Records removed before screening (n=1544) Duplicate records removed (n=698) Records excluded manually due to irrelevance (n=855)
Screening
Records screened (n=1521)
Records excluded (n=1343) Review, book chapters, expert opinion, conference papers and letter to editors (n=778) Abstract only (n=565)
Reports sought for retrieval (n=178)
Reports not retrieved (n=101)
Included
Reports assessed for eligibility (n=77)
Records excluded due to languages other than English (n=53)
Total studies included in review (n=24)