BRIEF COMMUNICATION

Status of Urinalysis in Nigeria: Way Forward

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ABSTRACT

Urinalysis serves as a diagnostic procedure employed to assess the condition of a patient's urinary system, encompassing the examination of physical, chemical and microscopic attributes within a urine sample. In Nigeria, urinalysis stands as a frequently utilized diagnostic modality, widely accessible within health care facilities and is generally cost-effective. Nevertheless, despite its widespread availability, certain obstacles persist that hinder its effective utilization. Through this review, we aim to emphasize the significance of urinalysis in the diagnosis of kidney diseases within low-income nations, while also addressing the impediments that hinder its proper application. We also propose a range of requisite measures for enhancement.

Keywords: Urinalysis, Nigeria, standardization, training, public education, kidney diseases

Urinalysis is a diagnostic test that is used to evaluate the health of a patient's urinary system. It involves analyzing the physical, chemical and microscopic characteristics of a patient's urine sample. According to the International Society of Nephrology (ISN) 0by25 study, point of care urinalysis with dipstick and creatinine estimation added to symptom-based health score helps in early diagnosis and treatment of kidney diseases in low-resource settings.[1]

More recently urinalysis was found to predict the development of acute kidney injury in coronavirus disease 2019 (COVID-19) patients in a low-resource setting.[2]

Urinalysis is an important disease surveillance tool in Nigeria. The prevalence of urinary abnormalities in young adults ranges between 20.7% and 54% in south-eastern Nigeria.[3,4] Microscopic hematuria suggestive of subclinical kidney damage is common among hypertensive Nigerians despite a high false-negative rate with dipstick urinalysis.[5] Bilirubinuria, urobilinogenuria, proteinuria and hematuria may be present in malaria and used as predictors of severity.[6] In Nigeria, urinalysis is a widely used diagnostic tool for various medical conditions that affect the urinary system. Dipstick urinalysis for example, is effective in community-based screening, clinic settings and occupational health assessments.[7-9] This is because dipstick urinalysis is cheap and can easily be deployed in rural settings.[10] Also, it does not involve any special training other than understanding the information pamphlet in the urinalysis strip kit as outlined by the manufacturer. Unfortunately, microscopic examination of urine is an art that is fast declining among nephrologists due to limited expertise, inadequate equipment and poor infrastructure. In the absence of other effective diagnostic tools such as immunofluorescence and electron microscopy in many centers across Nigeria, the clinical utility of light microscopy for both urinalysis and histological diagnosis, even though limited, cannot be overemphasized.[10]

A major drawback of urine examination is the inter-observer variations when doing the physical, chemical and microscopic assessment of urine. However, there are still some other challenges that need to be addressed in Nigeria. This article will discuss the status of urinalysis in Nigeria, the problems and suggest some ways to improve its use.

STATUS OF URINALYSIS IN NIGERIA

Urinalysis is a commonly used diagnostic tool in Nigeria. It is readily available in most health facilities and is relatively affordable. However, despite its availability,

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there are still some challenges that affect its use. Some of the challenges include:

- **Lack of standardization**: Urinalysis results in Nigeria are often not standardized. This means that different laboratories may produce different results for the same urine sample, making it difficult to interpret the results accurately. Also, the availability of different test kits for chemical assessment, which were mainly imported has made standardization difficult. Additionally, phase contrast microscope needed for optimal characterization of urine sediments is largely not available in many training centers and institution; hence, development of a standardized method of examination across the country cannot be easily achieved. Lack of national guidelines or protocols is a major challenge of urinalysis in Nigeria.
- **Inadequate training:** Some laboratory technicians in Nigeria are not adequately trained in urinalysis. This can lead to inaccurate results and misdiagnosis of medical conditions. This is not unexpected as there is inadequate laboratory equipment. Fogazzi et al[11] in a visit to Ahmadu Bello University Teaching Hospital, a foremost training institution in northern Nigeria, reported only one functional phase contrast microscope, which had never been used for urine microscopy. This finding led to establishing a program for urine microscopy between nephrologists and microbiologists in the hospital and a further training in Italy to acquire skills in urine microscopic examination.
- **Poor laboratory infrastructure**: Some health facilities in Nigeria lack the necessary laboratory infrastructure to carry out accurate and reliable urinalysis. This can result in delays in diagnosis and treatment of medical conditions.

WAY FORWARD

To improve the use of urinalysis in Nigeria, there are several steps that can be taken. These include:

- **Standardization:** There is a need to standardize urinalysis in Nigeria. This can be achieved through the establishment of national guidelines for the performance and interpretation of urinalysis. Standardization will ensure that results are accurate and reliable, making it easier for doctors to diagnose and manage medical conditions.
- **Training:** There is a need to train laboratory technicians in Nigeria on the proper techniques for conducting urinalysis. This will improve the accuracy of results and reduce the risk of misdiagnosis. There may also be a need for result verification by a pathologist to improve quality assurance.[12]
- **Infrastructure improvement:** There is a need to improve laboratory infrastructure in Nigeria. This can be achieved through the provision of adequate laboratory equipment and facilities. Both the chemical and microscopic assessment of urine can be automated to reduce human errors and inter-observer variability. This will ensure that results are obtained in a timely and accurate manner, improving patient outcomes.
- **Public education:** There is a need to educate the public on the importance of urinalysis. This will increase awareness about the test and encourage patients to seek medical attention when necessary. It can also reduce time to obtaining urine samples and sampling errors, which could reduce time to diagnosis and care in emergency settings.[13]

CONCLUSIONS

Urinalysis is an essential diagnostic tool that is used to diagnose and manage various medical conditions affecting the urinary system. In Nigeria, there is a need to standardize urinalysis, provide adequate training to laboratory technicians, improve laboratory infrastructure and increase public education on the importance of the test. By addressing these challenges, Nigeria can improve the use of urinalysis and improve patient outcomes.

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Indirect Airway Hyperresponsiveness Test Enhances Asthma Control in Children

Incorporating indirect airway hyperresponsiveness (AHR) test with hypertonic saline in the management of asthma in children can reduce the risk of mild exacerbations, suggests a new study published in the journal *Pediatric Pulmonology*.[1,2] Eosinophil counts were associated with the risk for recurrent exacerbations.

Janusz Ciółkowski from the Allergology Outpatient Clinic at the Regional Public Hospital in Lesko, Poland and colleagues conducted this study to establish the usefulness of indirect AHR testing with hypertonic saline in maintaining asthma control in children. For this, they enrolled 104 patients, aged 7 to 15 years, with mild to moderate atopic asthma in the study. All patients underwent spirometry and assessment of exhaled nitric oxide and blood eosinophils assessment at the start of the study and then every 3 months for 1 year. Patients were randomized to either a symptom-only monitored group or a group in which treatment was modified on the basis of symptoms and severity of AHR.

At the end of 1 year, the patients in the AHR group had fewer mild exacerbations compared to the symptom-only monitored group; 44 versus 85, respectively. The absolute rate per patient was 0.83 versus 1.67. However, changes in clinical (except asthma control test) parameters including inflammatory and lung function measures were comparable in both groups. The baseline eosinophil count was found to be linked to AHR and was "a risk factor for recurrent exacerbation in all patients", noted the authors. No significant difference was detected between the two groups when the final dose of inhaled corticosteroids (ICS) was being decided; 287 (AHR group) versus 243 (symptom-monitored group).

Performing a hypertonic saline test in children with asthma in addition to clinical monitoring of patients improves asthma control as evidenced by reduction in the number of mild exacerbations. The dose of ICS required to maintain asthma control was also comparable between the two groups. "The hypertonic saline test appears to be a simple, cheap, and safe tool for monitoring the treatment of mild to moderate asthma in children", concluded the authors.

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