World Kidney Day – Don't Forget The Children

R Akuse, A Ibrahim, M Bugaje, A Yakubu, J Raji, E Ebene, H Eno, H Abdukareem, K Ochube, S Gabaolu, L Daniel

Citation

R Akuse, A Ibrahim, M Bugaje, A Yakubu, J Raji, E Ebene, H Eno, H Abdukareem, K Ochube, S Gabaolu, L Daniel. *World Kidney Day – Don't Forget The Children*. The Internet Journal of Nephrology. 2012 Volume 6 Number 2.

Abstract

BACKGROUND: World Kidney Day (WKD) is an annual global campaign meant to raise awareness about the importance of kidneys and reduce the frequency and impact of kidney disease but the focus is usually on adults and not children. This is a report of screening of children during WKD 2011 in Giwa, a semiurban community in Nigeria. METHODOLOGY: The importance of screening was communicated through talks, songs and plays. Blood pressure (BP), weight and height were measured and dipstick urinalysis done. Proteinuria, hematuria, glycosuria and nitrituria were defined as 1+ or more, hypertension as BP greater than 95% for age, gender, and height. RESULTS: A total of 115 children (3 to 15 years, mean 9.97±3 years) participated; 93(80.8%) were male, 89(77.4%) were students. Six (6.4%) of 94 children whose BP were measured were hypertensive. Proteinuria, haematuria, glycosuria was detected in 3(2.7%), 2(1.8%) and 16(14.9%) respectively of 107 children. No child had nitrituria. Only one child went to the tertiary centre for follow up.CONCLUSION: Mass screening for hypertension, proteinuria, haematuria, glycosuria may be worthwhile but not for urinary tract infection. Data collected during WKD on a national scale could help determinate the cost benefit of screening and contribute to development of national screening policies in resource constrained countries. WKD offers opportunities to screen children who might otherwise be missed (e.g. those who don't attend school and/or in rural areas). Greater effort must be made to follow up those with abnormalities. This could be done by evaluating them in local health centres.

DISCLOSURES

Financial support : The study was part funded by Ahmadu Bello University Teaching Hospital, Shika-Zaria, Nigeria

INTRODUCTION

World Kidney Day (WKD) is an annual global health campaign initiated in 2006 by the International Society of Nephrology and the International Federation of Kidney Foundations [1]. Its purpose is to raise awareness about the importance of kidneys to health and reduce the frequency and impact of kidney disease and its associated problems. This is because increasing numbers of people are being affected by Chronic kidney disease (CKD) which is a strong risk factor for development of cardiovascular disease, the leading cause of mortality worldwide [1-5]. WKD has become a strong tool for advocacy to government officials, healthcare providers and the general public but in most countries, the focus is on adults and not children [6]. Although some organizations involve children in educational activities, few include them in the screening programmes of WKD [7]. Yet renal disease is a significant cause of morbidity in children worldwide [8].

Estimates of CKD in many resource constrained countries are difficult to obtain because of the lack of renal registries [9]. In Nigeria, (the most populous nation in Sub-Saharan Africa), the incidence of CKD is estimated to occur in 7.5 children per million of the childhood population [10]. These are probably underestimates as they exclude children who have no access to hospital care. Unfortunately renal disease often goes undetected until the patient presents in End Stage Renal Disease (ESRD) [9, 10]. This results in devastating social and financial consequences for the patients and their families as facilities for renal replacement therapy are limited, and too expensive for the majority of patients [3, 10]. Many Nigerian nephrologists recommend screening so as to detect kidney disease early and prevent or slow down progression to ESRD [11-13]. This is necessary because the general public has little awareness about kidney disease [14] and some people even use urine as treatment for illness [15]. WKD offers opportunities to educate communities which have little awareness about kidney disease and screen them for it. During the 2011 WKD, staff of Ahmadu Bello

University Teaching Hospital (ABUTH) Zaria, Nigeria carried out public enlightenment talks and screening of adults and children in Giwa - a nearby semiurban community. This is a report of the screening done among the children.

SUBJECTS AND METHODS

BACKGROUND

Giwa is a semiurban community situated in Northern Nigeria 250 kilometres from Abuja, the Federal capital and 10 kilometres from Ahmadu Bello University Teaching Hospital (ABUTH), Zaria. Giwa is the headquarters of Giwa local government which has a population of 286,427[16]. The residents are mainly Hausa/Fulani Muslims who engage in small scale farming [17]. Giwa has a general hospital, and primary health centres but the residents also patronize traditional healers [18].

PREPARATION FOR WKD

Planning and preparation for WKD took approximately six weeks. The first phase involved informing the management of ABUTH about the proposed project and seeking financial support for it. This was followed by meetings with the Chairman, the District head and members of the Giwa Executive Council as well as key political leaders. This was to sensitize them about the objectives of the proposed WKD programme. They granted permission for the WKD team to give talks and screen both adults and children. The Giwa local government health department personnel were also involved.

Some of the equipment used for screening during WKD was obtained from the ABUTH hospital e.g. stethoscopes, sphygmomanometers, weighing scales etc.). Funds were needed to buy consumables (gloves, urine bottles, dipsticks), provide banners, posters and pay for the services of a town crier to publicize the event; payment for interpreters, local theatrical group, transport, refreshments for the team and other logistics. Funding was provided by ABUTH and voluntary donations from members of the WKD team who were keen to start some form of preventive activity for kidney disease in communities near the hospital. The total project cost came to approximately 200,000 naira (US dollars 1,257).

METHODOLOGY

The WKD team consisted of doctors, nurses, health workers from the Nephrolgoy units of the Departments of Medicine and Paediatrics, Community Medicine, dialysis unit and medical students. The town crier went round town in a van using loud speakers to invite all residents to the village square for the program. The WKD coincided with a village market day which meant many people were able to attend the meeting at the village square. The District head, members of the executive council and their families were present. There were also a number of Muslim clerics. A talk was given about risk factors for development of kidney disease and the importance of screening. This was followed by songs and a play performed by a local theatrical troupe. From the discussion that followed, it appeared that the residents had little prior knowledge about kidneys, their function, or the importance of screening. They had no unique cultural or religious views about the kidneys. Activities were carried out in the local language (Hausa). The program lasted from 9am to 4pm. Adults were then invited to go for screening and were asked to bring their children. The results of the adult screening are reported elsewhere.

Children were screened at a separate station in the same locality as the adults. Biodata, family and medical history, information about drug ingestion, use of traditional medication, and symptoms of illness was collected and entered into a proforma. The weights and heights of the children were recorded. Blood pressures (BP) were measured using a mercury sphygmomanometer with an appropriately sized cuff with the child seated. Dipstick analysis was done using Combi 9 (Macherey-Nagel). Abnormal findings were confirmed on a second urine sample. Parents were notified of the results and those whose children had abnormal findings given referral letters to the paediatric nephrology clinic at ABUTH for further evaluation.

DATA MANAGEMENT

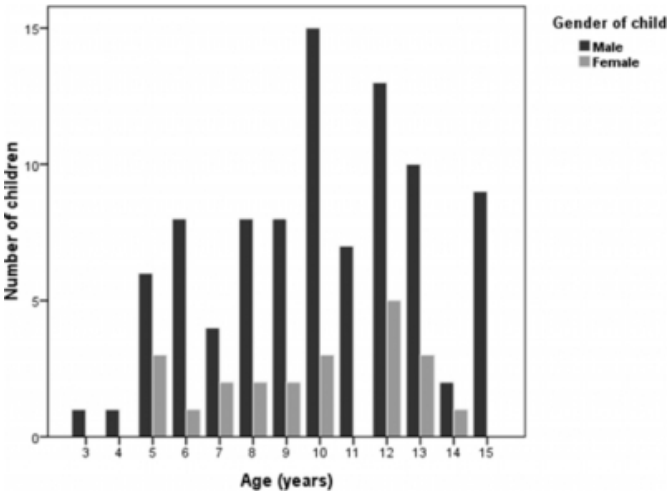
Data was analyzed using SPSS version 16 computer package for windows. Proteinuria, hematuria, glycosuria, nitriuria were defined as a reading of 1+ or more on dipstick and Hypertension as systolic and/or diastolic BP greater than 95% for age, gender, and height. Body mass index (BMI) for the children's gender, weight and height was calculated using a BMI Calculator [19].Frequencies of all variables were calculated but children with missing information were excluded. Crosstabulation of variables was done. Quantitative variables were presented as mean, standard deviation, range, while qualitative variables as frequencies, percentages and numbers in parenthesis.

RESULTS

A total of 115 children - 93(80.8%) boys and 22(19.1%) girls participated. Their ages ranged from 3 to 15 years (mean 9.97±3 years) (Fig1).

Figure 1

Figure 1: Age and gender distribution of children



Most 89(77.4%) were students but 26(22.6%) (3-15 years) were not attending school. Details of their history are shown in Table 1.

The BMI of 106 children for whom it was calculated, ranged from 12 to 23kg/m^2. Most 79(74.5%) had appropriate BMI, but 16(15.1%) were underweight, 10(9.4%) overweight, and one child was obese.

Figure 2

Table 1: History of children who participated in World kidney day screening

History	Number of children n (%)
Past History of passage of Foamy urine	47 (40.9)
Past History of passage of Blood in urine	11 (9.6)
Past History of Body swelling	13 (11.3)
Past History of scabies	14 (12.2)
Past History of Ingestion of herbal medication	47 (40.9)
Past History of Ingestion of analgesics	93 (80.9)
Family history of hypertension	17 (14.8)
Family history of kidney disease	16 (13.9)
Family history of deafness	12 (10.4)
Family history of diabetes	5 (4.4)

URINARY ABNORMALITIES

Proteinuria was detected in 3(2.8%), haematuria in 2(1.9%), glycosuria in 16(14.9%), and nitrituria in none of 107 children whose urine was tested. Children with proteinuria (1+) were all male, aged 8 to 12 years. Two had a history of foamy urine, all of ingestion of analgesics and one of traditional medication. Haematuria was found in two 13 year old boys, one of whom gave a history of passage of bloody urine. Sixteen (13.9%) other children aged 5 to 14 years had glycosuria. Four of these complained of illness (headache and deafness), 2 had a family history of diabetes and 3 were overweight.

HYPERTENSION

Six (6.4%) of 94 children whose BP was measured were hypertensive. They were aged 7 to 12 years and 4(66.7%) were male. Most 4(66.7%) were asymptomatic. One (16.7%) had isolated systolic hypertension, 2(33.3%) isolated diastolic hypertension and 3(50%) combined systolic and diastolic hypertension. None had a family history of hypertension or kidney disease. One child gave a history of scabies and the other of body swelling and foamy urine. All had past history of ingestion of traditional medication and analgesics. Only one child (who had combined systolic and diastolic hypertension) had proteinuria (1+).

Figure 3

Figure 2: Children being screened during world kidney day health screening activities in Giwa, Nigeria

PROBLEMS ENCOUNTERED

Children and parents showed great interest but it took more time, staff and effort to attend to children than to adults. Some of the younger children were unable to produce urine on request.

FOLLOW UP

A total of 26(22.6%) children had abnormal findings. Ten (8.7%) had indicators of possible renal disease (hypertension, proteinuria, haematuria) and 16(13.9%) glycosuria. All were referred for further evaluation but only one went – a boy who had previously been treated for glomerulonephritis in ABUTH

DISCUSSION

Abnormalities that could indicate possible renal disease were detected during screening, but in most cases the significance of these findings could not be determined because many children were not taken for further evaluation.

The prevalence of proteinuria and haematuria in this study were in the mid-range of that found in other studies in Nigeria which recorded proteinuria in 1% to 7.7% and haematuria in 0.55% to 3.8% of children screened [20-25]. The prevalence of hypertension was similar to that found by another researcher among rural children [26] but other studies report both higher and lower prevalences (ranging from 3.5% to 9.5%).[27-29]. A surprising high percentage (13.9%) of children had glycosuria. Studies from other parts of the country recorded prevalences of 0 to 2.9% of glycosuria [20, 21]. These variations in prevalence are probably due to differences in age, ratio of males to females and disease patterns of the various populations.

However the apparently low yield of proteinuria and haematuria raises questions about whether urinary screening is cost effective. Screening for hypertension is generally accepted worldwide but there is controversy about the value of urinalysis [30]. In North America and Europe, mass screening using dipstick urinalysis is discouraged because of low diagnostic yield and lack of evidence that it leads to reduction in the number of children who progress to ESRD. In contrast, in the Far East, mass urinalysis of school children is routinely done annually as it is said to be highly effective in detecting kidney disease [30-31]. From this study, it appears that screening for hypertension, proteinuria, haematuria and glycosuria might be beneficial. However the absence of nitrites, which is a marker for urinary tract infection (UTI), implies that mass screening for UTI may not be worthwhile – a view shared by Abdurrahman many years earlier [25].

The study was limited because renal disease could not be confirmed in most of the children. The reasons why they were not taken for further evaluation could not be ascertained. It is possible that the children were perceived by their parents to be healthy as most were asymptomatic. However other researchers have reported that transportation costs affect use of western medical care in Giwa [32-33]. Evaluation is necessary because abnormalities might be due to other conditions. For example proteinuria could result from fever, exercise, orthostatic proteinuria or UTI while trauma, sickle cell disease, UTI or other conditions could cause haematuria [34]. Transient glycosuria, diabetes mellitus and a low renal threshold must be excluded in children with glycosuria though it could also be due to renal causes like Fanconi syndrome, diabetic nephropathy, UTI or CKD [34-36]. Thus efforts must be made to increase follow up. One method could be by arranging for children to be seen at local health facilities and only those with persistent abnormalities would then be referred to specialist centres. As an alternative, specialists could visit community health facilities at regular intervals.

Non communicable diseases are increasingly becoming important causes of childhood morbidity and mortality [10]. Early detection of renal disease could help reduce morbidity, mortality and associated health costs but most resource constrained countries are yet to develop screening strategies [37-38]. Some researchers have advocated routine screening of school children [20]. It should be noted that almost 23% of the children were not attending school and these children would be missed if screening of school children was done. WKD offers a means of testing children who could otherwise be missed e.g. those who do not go to school and/or those who live in rural areas. Thus it is recommended that National nephrology associations should encourage screening of children during WKD. Their members could collect data in communities in different parts of their countries and the information gathered could then be collated in a national database. This could provide data which could contribute in the development of national screening policies.

Efforts to detect prevent and slow progression of CKD must not be left only to governments or governmental agencies. Non-governmental organizations and communities must be involved [3]. No effort was made to involve traditional healers but it is possible that if they are involved, they may prove to be a means of reaching more people in the community.

CONCLUSION

WKD offers an opportunity to screen children for kidney

disease including those who might otherwise be missed. Data collected could help assist in development of national screening policies but efforts must be made to improve further evaluation of those with detected abnormalities. This calls for cooperation between the government, the health sector and community. Hard work - Possibly, but the next generation is worth it.

References

1. Thomas H. Hostetter DJ, Kochis RN, et al for the ASN Public Policy Board World Kidney Day 2011EDITORIALS J Am Soc Nephrol 2011; 22: 397–398,. doi: 10.1681/ASN.2011020115
2. World Health Organization. Preventing Chronic Diseases: A Vital Investment:. WHO Global Report. 2005. http://www.who.int/chp/chronic_disease_report/en/ Accessed 30.05.2012
3. Arogundade FA, Barsoum RS. CKD prevention in Sub-Saharan Africa: a call for governmental, nongovernmental, and community support. Am J Kidney Dis. 2008; 51(3):515-523.
4. Go AS, Chertow GM, Fan D, et al. Chronic kidney disease and the risks of death, cardiovascular events, and hospitalization. N Engl J Med 2004; 351:1296-1305.
5. Davis CL, Harmon WE, Himmelfarb J et al for the American Society of Nephrology Public Policy Board. World Kidney Day 2008: Think Globally, Speak Locally EDITORIALS www.jasn.org. J Am Soc Nephrol 19: 413–416, 2008.doi: 10.1681/ASN.2008010070
6. Koshy SM, Garcia-Garcia G, Pamplona JS et al. Screening for kidney disease in children on World Kidney Day in Jalisco, Mexico. Pediatr Nephrol 2009; 24(6):1219-1225.
7. Kids Kidney Research. http://www.kidskidneyresearch.org Accessed 30.05.2012.
8. Ardissino G, Daccò V, Testa S, et al. Epidemiology of chronic renal failure in children: data from the ItalKid project. Pediatrics. 2003;111(4, part 1):e382–e387
9. Naicker S. End-stage renal disease in sub-Saharan and South Africa. Kidney Int Suppl. 2003 Feb ;(83):S119-22
10. Anochie I, Eke F. Chronic renal failure in children: a report from Port Harcourt, Nigeria (1985-2000). Pediatr Nephrol 2003; 18(7):692-5.
11. Obinna C. Nigeria: 100 Nephrologists Are Serving 160 Million Citizens –Vanguard, 13 March 2012 allafrica.com/stories/201203130713.html
12. Ulasi II, Ijoma CK, Arodiwe EB, Okoye JU, Ifebunandu NA. Lifestyle Risk Factors: Do they contribute to chronic kidney disease in developing countries? The Internet Journal of Nephrology. 2010 Volume 6 Number 1. DOI: 10.5580/290e
13. Afolabi MO,Prevalence of chronic kidney disease in a Nigerian family practice population SA Fam Pract 2009;51(2):132-137
14. Alebiosu CO. Awareness of kidney disorders in Nigeria. Afr J Health Sci. 2002; 9(3-4):165-8.
15. Ogunshe AAO, Fawole AO, Ajayi VA. Microbial evaluation and public health implications of urine as alternative therapy in clinical pediatric cases: health implication of urine therapy. Pan African Medical Journal. 2010; 5:12: http://www.panafrican-med-journal.com/content/content/article/5/12/ful
16. National Population Commission of Nigeria 2006. www.population.gov.ng/
17. Kudi,TM, Usman I, Akpoko JG, Banta AL. Analysis of the Impact of National Fadama Development Project II (NFDP II) in Alleviating Poverty Among Farmers in Giwa Local Government Area of Kaduna State, Nigeria Ozean Journal of Applied Sciences 2008;1(1): 9-15
18. Faleyimu OI, Ahmad IH, Akinyemi O. Herbal Approach to the Treatment of Chicken pox: A Case study of Giwa Local Government, Kaduna State. Nigeria International Journal of Biomedical and Health Sciences 2010; 6: (1)3-18
19. BMI calculator. © 2010 State Government of Victoria. http://www.betterhealth.vic.gov.au/bhcv2/bhcsite.nsf/pages/bmi4child. Better Health Channel Last Updated 11/02/2011
20. Akor F, Seline N, Okolo,Emmanuel I Agaba,Okolo A. Urine examination findings in apparently healthy new school entrants in Jos, Nigeria SAJCH 2009;3: 2:60-63
21. Ikimalo FE, Eke FU, Nkanginieme KEO, Ikimalo J. Urinary screening for detection of asymptomatic haematuria and proteinuria in children in urban and periurban schools in Port Harcourt. Nig J Paediatr 2003;30: 1-6.
22. Oviasu E, Oviasu SA. Urinary abnormalities in asymptomatic adolescent Nigerians. West Afr J Med 1994;13: 152-155
23. Adesola AT, Akebu OO, Ademola OG, Akinwale A: Proteinuria in the rural Primary School Setting in Nigeria-Using Combi Test Strips. The internet Journal of Third World medicine. 2007, Vol 4 number 2.
24. Akinkugbe FM, Akinwolere OAO, Oyewole AIM. Isolated Proteinuria in asymptomatic Nigerian children. Nig J Paediatr 1991; 18:32-36.
25. Abdurrahman MB, Chakrabarty DP, Ochoga SA. Bacteriuria and other urinary abnormalities among primary school children in Kaduna. Nig J Paediatr 1978; 5: 21-24.
26. Obika LFO, Adedoyin MA, Olowayeye JO. Pattern of Paediatric Blood Pressure in rural, semi urban and urban communities in Ibadan. Nig. Afri J Med Sci. 1995; 24:371-377.
27. Oviasu VO, Alakija W. Difference in arterial blood pressure and body build in the first and second decades of life in rural and urban Nigeria. Trop Cardio 1978;4:113-125
28. Bugaje MA, Yakubu AM, Ogala WN. Prevalence of Adolescent Hypertension in Zaria. Nig J Paediatr 2005; 32(4):77-82
29. Abdulrahman FA, Babaoye AA. Childhood hypertension in northern Nigeria. West Afr J Med 1978; 1(4):7-11.
30. Hogg RJ. Screening for CKD in children: a global controversy. Clin J Am Soc Nephrol. 2009; 4(2):509-15.
31. Murakami M, Hayakawa M, Yanagihara T, Hukunaga Y. Proteinuria screening for children. Kidney Int Suppl. 2005; 94:S23-7.
32. Ogwurike S, Pam V. Means of transportation and its effect on eye care seeking behaviour of patients in a rural setting. Annals of African Medicine. 2004; 3: 2: 83 – 86.
33. Musa EO, Ejembi CL. Reasons and outcome of paediatric referrals from first level health facilities in Sabongari, Zaria, Northwestern. Nigeria. Journal of Community Medicine & Primary Health Care. 2004; 16 (1) 10-15.
34. Patel HP. The Abnormal Urinalysis. Pediatric Clinics of North America 53, 2006; 325-337.
35. Mavrakanas TA, Tomos C, Pratsiou P, Seventekidou I, Tzouvelekis G. Transient glycosuria during a urinary tract infection. La Presse Médicale 2010: 39:1:145-146 Doi : 10.1016/j.lpm.2009.09.002
36. Qayser S. Al-Habeeb, Hana A. Tawfik, Hisham R. Al-Eidani . Early Detection of Diabetic Nephropathy in Children and Adolescents with Type 1 Diabetes Mellitus. Dohuk Medical Journal. 2008; 2(1): 91-106.
37. Abegunde DO, Mathers CD, Adam T, Ortegon M,

Strong K: The burden and costs of chronic diseases in low-income and middle income countries. Lancet 2007; 370: 1929–1938
38. Li PKT, Weening JJ, Dirks J, et al .A report with consensus statements of the International Society of Nephrology 2004 Consensus Workshop on Prevention of Progression of Renal Disease, Hong Kong, June 29, 2004. kidney International (2005) 67, S2–S7; doi:10.1111/j.1523-1755.2005.09401.x

Author Information

Rosamund M. Akuse
Department of Paediatrics, Nephrology unit, Ahmadu Bello University Teaching Hospital

Abubakar Ibrahim
Department of Medicine, Nephrology unit, Ahmadu Bello University Teaching Hospital

Mairo A. Bugaje
Department of Paediatrics, Nephrology unit, Ahmadu Bello University Teaching Hospital

Abdulmumin O. Yakubu
Department of Paediatrics, Nephrology unit, Ahmadu Bello University Teaching Hospital

Jimoh A. Raji
Department of Nursing Services, Ahmadu Bello University Teaching Hospital

Eucharia C Ebene
Dialysis unit, Ahmadu Bello University Teaching Hospital

Helen G. Eno
Dialysis unit, Ahmadu Bello University Teaching Hospital

Hawa Abdukareem
Dialysis unit, Ahmadu Bello University Teaching Hospital

Kaine Ochube
Dialysis unit, Ahmadu Bello University Teaching Hospital

SE Gabaolu
Dialysis unit, Ahmadu Bello University Teaching Hospital

Lami Daniel
Dialysis unit, Ahmadu Bello University Teaching Hospital