Screening for urine abnormalities among preschool children in Western Saudi Arabia

To the Editor

I read with interest a study by Alharthi et al[1] on the screening for urine abnormalities among preschool children in western Saudi Arabia. The authors stated that dipstick urine analysis (DUA) revealed abnormal findings in 25.1% of the screened children. The most common dipstick abnormalities were positive nitrite test in 18.1%, hematuria in 16.9%, and positive leukocyte esterase test in 14.3% of the cases. The most common abnormality in microscopic urine examination was crystals in 13% of the cases. Pyuria were evident in 5% of cases and hematuria in 2.5%. The most common bacteria in positive urine culture samples was *Escherichia coli* in 62.6%. In view of the aforementioned data, the authors recommended implementing DUA screening among preschool children. Unexpectedly, the authors did not consider limitations in their study before making that recommendation. Hence, I presume that their recommendation ought to be cautiously considered owing to the presence of the following 4 limitations: 1) The study period was relatively short (August-December); 2) The data were obtained from a single center. It is, therefore, not truly representative of the whole pediatric population in the Kingdom of Saudi Arabia (KSA); 3) Generally, the magnitude of a certain health problem in a given population ought to be sizable in order to merit screening. The reported incidence of pediatric chronic kidney diseases (CKDs) was recently reported to be <1.0-8, and end-stage renal diseases (ESRDs) in the developing countries had been 3.4-35 per million child population.[2] However, the exact magnitude of pediatric CKDs in KSA is not yet known as there is no current national epidemiologic data on that issue;[3] and 4) The cost-effectiveness ratio of DUA for the early detection of CKDs needs to be considered. In an interesting American study,[4] decision analysis was used to model a screening DUA strategy relative to a no-screening strategy. The expected costs and effectiveness for the no-screening strategy were 0 dollars as no resources were used, and no cases of CKDs were diagnosed. However, the screening strategy involved a cost of 3.05 dollars per dipstick. Accounting for true-positive and false-positive initial screens, 14.2% of patients required a second dipstick as per typical clinical care, bringing the expected cost of the screening strategy to 3.47 dollars per patient. In the screening strategy, one case of CKD was diagnosed per 800 screened, and the incremental cost-effectiveness ratio was 2,779.50 dollars per case diagnosed.[4] In brief, I presume that conducting large scale multicenter studies over an extended period of time to assess the yield of DUA in early detecting urine abnormalities together with the determination of cost-benefit ratio for Saudi pediatric population are essential prerequisites to justify the implementation of DUA screening program.

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Reply from the Author

Many thanks to Prof. Al-Mendalawi for the comments, and here is our response according to points: 1) We believe this time (August-December) was enough as we could screen 1000 child during this period. The timing and number is comparable to other studies carried out for similar conditions. In 2011, Hajar et al[5] implemented their study between February 2010 and March 2010 on 870 asymptomatic children. Akor et al in 2009[6] conducted their study on 650 children and documented the sufficiency of this sample size for the screening; 2) The Children Hospital in Taif is government-funded, and serves approximately 400 children daily. It was chosen because it is the largest center at Taif serving children from all sectors of population. The center chosen cannot affect the screening because our focus was not the sick children presenting to the hospital, but we screened the apparently healthy children coming in with their mother or father, and accompanying their sick sisters or brothers, and so we considered these screened children representative for all Saudi children; 3) It is true that screening for a certain problem should be carried out on conditions prevalent in populations, and that the incidence of CKDs and ESRDs is low in developing countries however, justification for screening here comes on the following basis: a) the exact magnitude of pediatric CKDs in KSA is not yet known as there is no current national epidemiologic data on that issue; b) Urinary abnormalities can lead to devastating sequale in children; and c) It has been recommended that detection and management of renal problems in

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children are of major importance for CKD prevention; this in turn will decrease the burden of CKD in the pediatric population,[7] and 4) In the aforementioned study for cost-effectiveness, they did not consider the cost of missing a positive case in early stages of the disease and the cost caused by deterioration to devastating condition which could cost much in management. Besides this, I refer to the discussion paragraph on the importance of dipstick in screening children, which is, "in developing countries, the national epidemiologic data on CKD in the pediatric population is currently limited".[8]

A cornerstone in the evaluation of kidney function is urine analysis, which is a simple and inexpensive test. Dipstick method is the most rapid screening procedure used in the early detection of urinary tract diseases, thus, helping in the prevention and retarding progression to chronic renal failure.[1]

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