

Routine urine analysis in university candidates: is it worthwhile?

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التحليل الروتيني للبول بين المرشحين للدراسة الجامعية: هل يستحق العناء؟

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خلاصة: كان هدف هذه الدراسة بحث الموجودات غير الطبيعية التي يكشف عنها تحليل البول بين المرشحين للدراسة الجامعية. لقد أجرى عدد بمجموعه 247 طالباً (150 من الذكور و97 من الإناث) (العمر الأوسط 20.08 سنة)، كشفاً طبيياً يتضمن فحص البول. وتبين أن 38 عينة بول من بين جميع العينات كانت بها موجودات غير طبيعية (واحد أو أكثر في كل تحليل). ووجدت بيلة قيسية في 20 طالباً (8.1%)، وبيلة دموية في 15 طالباً (6.1%)، وبيلة ألبومينية في 12 طالباً (4.8%)، وأسطوانات بولية في 9 طلاب (3.6%). ولم توجد أية بيلة سكرية. بينما وجدت جراثيم لدى 22 طالباً (8.9%) وخمائر لدى طالبين (0.8%). إن هناك ما يبرر إجراء الاختبار الروتيني لطلاب الجامعات، بسبب النسبة المثوية من الموجودات غير الطبيعية التي يكشف عنها، ونظراً لأهميته في مجال ترصد الأمراض. غير أنه لا ينبغي أن يكون معياراً لرفض قبول الطلاب بالجامعات.

ABSTRACT The study aimed to investigate the abnormalities in urine analysis in university candidates. A total of 247 students (150 males, 97 females) (mean age 20.08 years) had a medical check-up including urine analysis. In all, 38 urine samples had abnormalities (one or more abnormality/urinalysis). Pyuria was found in 20 students (8.1%), haematuria in 15 (6.1%), albuminuria in 12 (4.8%) and casts in 9 (3.6%). No glycosuria was found. Bacteria were found in 22 students (8.9%) and yeasts in two (0.8%). Urinalysis is warranted as a routine test in university students because of the percentage of abnormalities found and its importance in disease surveillance. However, it should not be a criterion for refusal by universities.

L'analyse d'urine systématique chez les candidats à l'entrée à l'université: quel intérêt ?

RESUME Le but de cette étude était d'examiner les anomalies décelées dans l'analyse d'urine chez des candidats universitaires. Au total, 247 étudiants (150 sujets de sexe masculin et 97 de sexe féminin) (âge moyen 20,08 ans) ont subi un examen médical comprenant une analyse d'urine. En tout, 38 échantillons d'urine présentaient des anomalies (une ou plusieurs anomalies/analyse d'urine). On a trouvé une pyurie chez 20 étudiants (8,1%), une hématurie chez 15 (6,1%), une albuminurie chez 12 (4,8%) et des cylindres chez 9 (3,6%). On n'a pas trouvé de glycosurie. Des bactéries étaient présentes chez 22 étudiants (8,9%) et des levures chez deux (0,8%). L'analyse d'urine se justifie en tant qu'examen systématique chez les étudiants universitaires en raison du pourcentage d'anomalies détectées et de son importance dans la surveillance des maladies. Toutefois, elle ne devrait pas constituer un critère pour opposer un refus de la part de l'université.

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Introduction

Urinalysis is an essential part of clinical assessment. An abnormal urinalysis, mainly proteinuria, has serious implications for a person and may lead to rejection from the armed forces, denial of life insurance or disqualification from a new job.

There is considerable information on the prevalence of urinary abnormalities in outpatient clinics, in hospitals [1-3], in asymptomatic children [4-6] and in healthy adults [7].

In clinical practice it is better to do urinalysis in all patients as a check against having missed a clue to a relevant disease in the history or examination. The finding of an abnormality in routine urinalysis is of no importance if it does not lead to useful corrective treatment [8].

The detection of proteinuria and/or haematuria is useful in selecting patients who require long-term surveillance [9]. In some patients, proteinuria may last for years without other evidence of kidney damage, or it may be an insignificant and transient laboratory finding [10, 11]. Haematuria, after exclusion of serious urinary tract infection, renal calculi and malignancy may follow a benign course and have a good prognosis as indicated by Pardo et al. [12] who, on kidney biopsy of patients with haematuria, found either normal glomeruli or discrete mesangial proliferation, and found that the patients were free of any deterioration of kidney function on a 4-year follow up. Hence, the appropriate name of benign primary haematuria; however, this does not mean such abnormalities should be ignored. Glycosuria is highly inducible and has significant correlation with blood glucose level [7, 11]. Pyuria is a common problem, mainly in women; it has been reported that as many as a quarter may experience an acute dysuric episode each year [13, 14].

Urine analysis may also be an alternative to urine culture [15], although this is not valid in many special conditions [16].

Subjects and methods

We examined students enrolling in the University of Al-Bayt in Mafraq, northern Jordan in the first semester of the academic year 1996-1997. A total of 247 students (150 males, 97 females) with a mean age of 20.08 years (18-38 years) were given a medical check-up which included urine analysis.

A random mid-stream urine sample was collected in a sterile container and examined within 45-60 minutes of voiding. A volume of 5 cm³ of urine was centrifuged for 5 minutes and the sediment was examined microscopically ($\times 40$) by the same operator for protein, glucose and bilirubin with a specialized dipstick.

Urinalysis was considered abnormal according to the criteria of Kroenke et al. [17] as follows: haematuria > 2 red blood cells/high-power field, pyuria > 5 white blood cells/high-power field, casts other than hyaline and proteinuria > trace. Glycosuria, urine colour and reaction, and the presence of bacteria were also tested. The sample was tested regardless of age.

Statistically, standard error of percentage (SEP), normal Gaussian distribution and *z* static test were calculated.

Results

An overall abnormal urine analysis (one or more abnormality) was found in 38 urine samples (15.4%) (SEP = 2.29; 95% CI 0.109-0.199 corresponding to $P < 0.05$). All analyses were carried out twice and the initial total abnormal result was 19.75%.

Table 1 Abnormal findings in the urinalysis of 247 subjects

Abnormality (n = 247)	No.	%	P-value	95% CI
Abnormal colour ^a	3	1.2	NS	-0.00153 to 0.0256
Glycosuria	0	0		
Haematuria	15	6.1	< 0.05	0.0155 to 0.1064
Pyuria	20	8.1	< 0.05	0.047 to 0.115
Casts	9	3.6	< 0.05	0.0535 to 0.1245
Proteinuria	12	4.8	< 0.05	0.0213 to 0.0746
Bacteria	22	8.9	< 0.05	0.535 to 0.1245
Yeasts	2	0.8	NS	-0.0031 to 0.0191
Bilirubin positive	1	0.4	NS	-0.387 to 0.0118

^aabnormal colour = 2 turbid, 1 reddish

NS = not significant CI = confidence interval

Pyuria was found in 20 subjects (8.1%), haematuria in 15 subjects (6.1%), proteinuria in 12 (4.8%) and casts in 9 (3.6%) (granular casts 6, red blood cell casts 3). No glycosuria was found. Other findings and their statistical significance are shown in Table 1.

One or more abnormality in urinalysis was found in 10.5% of females (F) and in 7.3% of males (M) (F:M ratio = 1.4 :1) The distribution by sex is shown in Table 2. There was no statistical difference between the sexes ($P = 0.39$).

Table 2 Results of abnormal findings of urinalysis by sex

Abnormality (n = 247)	Males (n = 150)		Females (n = 97)	
	No.	%	No.	%
Proteinuria	7	4.7	5	5.1
Haematuria	7	4.7	8	8.2
Pyuria	6	4.0	14	14.4
Casts	7	4.7	2	2.1
Bacteria	21	14	1	1.03
Yeasts	0	0	2	2.06
Abnormal colour	1	0.7	2	2.06
Bilirubinuria	1	0.7	0	-

$P = 0.39$

Discussion

The results of our study are comparable to those found in large screenings [3-8, 18]. Our study differs from previous studies, which were conducted in hospital or in outpatient clinics, as it was carried out in asymptomatic university students. Hence the yield was lower [2.3.8.19].

The routine nature of urinalysis may make physicians overlook substantial abnormalities; this is unfortunate and should be deplored because of the possible consequences of missing serious curable conditions. An abnormal result should alert physicians and prompt them to change their management lines. At the same time, overestimating the risk of an abnormal urinaly-

sis should be avoided and serious decisions which could affect the patient's future should only be made after adequate investigation of the significance of the abnormalities, because, frequently, simple urinalysis is operator-dependent. The use of automated analysers has reduced the error rate and met requirements in terms of analytical performance, reliability, versatility and speed in routine urine analysis [20].

Urinalysis is a simple semiquantative test which can detect various types of illness and may give the earliest warning of unexpected and significant pathology. It is

an accepted and well established component of many screening programmes.

We conclude that urine analysis is important for disease surveillance, and is warranted as a routine test for university students because of the useful results it provides, but it should not be a criterion for refusal by universities.

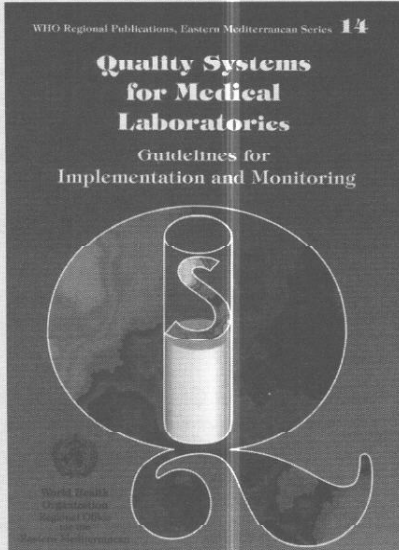
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