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ORIGINAL ARTICLE

Validity of urine dipstick test to assess eradication of urinary tract infection in persons with spinal cord injury



Validité de la bandelette urinaire dans l'évaluation de l'éradication des infections urinaires chez les patients blessés médullaires

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KEYWORDS

Urinary tract infection;
Spinal cord injury;
Urine dipstick;
Antibiotic therapy;
Predictive value;
Bacteriuria

Summary

Objectives. — To prospectively study the predictive value (PV) of urine nitrite (NIT) dipstick testing against urine cultures during antibiotic treatment for urinary tract infection (UTI), and other situations, in patients with spinal cord injury (SCI).

Methods. — Inpatients with SCI on intermittent catheterisation (IC) or a Foley indwelling catheter (FC) were included. Urine specimens were collected in patients without symptoms (routine), with symptoms of UTI (suspicion), and on day 4 of a 5-day antibiotic treatment (ATB + 3).

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Results. — A total of 157 urine samples were collected in 61 patients: 34 were on IC (95 samples) and 27 on FC (62 samples). The prevalence of asymptomatic bacteriuria in the urine cultures was 89% in routine (70 samples). At ATB + 3, microbiological cure was found in 27/30 specimens (IC group) and 2/6 (FC group). In the routine condition, the specificity and positive PV of the NIT tests was 1.00 and sensitivity 0.63. The negative PV was low in both groups. In suspicion of UTI, the sensitivity was between 0.69 and 0.55, the positive PV was 1.00 and the negative PV 0.00 for both groups. At ATB + 3, the negative PV and sensitivity was 1.00, specificity 0.85 and positive PV 0.43 in the IC group, and in the FC group, specificity was 1.00, negative PV 0.33 and sensitivity 0.00.

Conclusion. — In the SCI population on intermittent or indwelling catheters with high prevalence of bacteriuria, dipstick testing helped assess the eradication of germs during antibiotic treatment, but showed no value in the decision making process for UTI.

Level of evidence.— 3.

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MOTS CLÉS

Bandelette urinaire ;
Infection urinaire ;
Blessé médullaire ;
Antibiothérapie ;
Valeur prédictive ;
Bactériurie

Résumé

Objectif. — Étude prospective de la valeur prédictive (VP) des bandelettes urinaires comparées à l'ECBU, dans différentes conditions cliniques, chez le patient blessé médullaire (BM).

Méthode. — Patients BM hospitalisés pratiquant les sondages intermittents (SI) ou en sonde à demeure (SAD). Les ECBU ont été prélevés chez des patients sans symptômes (routine), avec symptômes d'infection urinaire (suspicion) ou au 4^e jour d'un traitement antibiotique (ATB + 3).

Résultats. — Un total de 157 ECBU ont été collectés chez 61 patients : 34 aux SI (95 échantillons) et 27 en SAD (62 échantillons). La prévalence de la bactériurie asymptomatique chez des patients asymptomatique (routine) était de 89 % (70 ECBU). À ATB + 3, l'éradication des germes (ECBU stérile) était retrouvée sur 27/30 échantillons dans le groupe SI et 2/6 dans le groupe SAD. En routine, la spécificité et la VP positive des bandelettes urinaires étaient de 1,00 et la sensibilité de 0,63. La VP négative était faible dans les 2 groupes. En cas de suspicion d'infection, la sensibilité était entre 0,69 et 0,55, la VP positive de 1,00 et la VP négative de 0,00 pour les 2 groupes. À ATB + 3, la VP négative et la sensibilité étaient de 1,00, la spécificité de 0,85 et la VP positive de 0,43 dans le groupe SI, la spécificité de 1,00, la VP négative de 0,33 et la sensibilité de 0,00 dans le groupe SAD.

Conclusion. — La VP négative des bandelettes urinaires est particulièrement intéressante pour diagnostiquer l'éradication des germes. Les bandelettes urinaires n'ont aucun intérêt dans le diagnostic d'infection urinaire chez les patients médullaires aux SI ou en SAD, du fait de la prévalence élevée de la bactériurie.

Niveau de preuve.— 3.

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Introduction

Bacteriuria, either symptomatic or not, is the most common medical complication in patients with spinal cord injury (SCI), both in the acute phase and throughout their lifetime [1–3]. Prevalence of lower urinary tract colonization (asymptomatic bacteriuria) has been reported between 50% and 90%, both at home and in hospital [4–6], while urinary tract infection (UTI – symptomatic bacteriuria) and urinary complications are the first cause of rehospitalisation in tetraplegic patients [7].

The diagnosis of symptomatic UTI is based on a combination of clinical signs and bacteriological criteria determined from urine cultures [8–10]. Symptoms include urinary, bladder or general signs [9,11], while significant bacteriuria is

dependent on the mode of voiding. However, cultures are costly, time consuming and require at least 24 hours [12]. Over the last thirty years, the urinary dipstick test has become increasingly used as an alternative, as it is cheap and can be used as a bedside test, enabling a quick diagnosis. Studies have shown its utility in variety non-neurological disorders, particularly to rule out infections [12].

In patients with SCI, dipstick results for nitrite (NIT) and leukocyte esterase (LE) are part of the essential components of the UTI basic data set [11], and are widely used in rehabilitation settings [13]. However, there is a clear lack of scientific evidence to support their utility and there is still some confusion as to the validity of dipstick testing to confirm infection. In a recent review of the literature, Cameron et al. concluded that NIT and LE dipsticks are sen-

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